BLANCLABO
laboratory equipment

LABWIT®

User's Manual

Ultimate-Cell
Stackable Shaking Incubator
Orbital Model

This Manual applies to:

Modes: ZWYC-290A

ZWYC-290A

nqa. ISO 9001 Registered
UKAS QUALITY MANAGEMENT 015
DNV
CE

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1. INTRODUCTION

Prior to operation, this manual should be read thoroughly and completely understood-as it might be helpful to master the operation techniques of this unit. LABWIT shall have no obligation and responsibility for any damage on the instrument caused by users for failing to comply with the operation instruction and the environmental requirements stated in this specification.

LABWIT is entitled to modify the content of the specification at any time without appropriate notification.

LABWIT shaking incubators have achieved a good reputation and trust among various clients for its advanced temperature controlling technology, sound framework design, excellent molded exterior and outstanding professional workmanship. These products have been exported through most leading companies into European, American and East Asian markets.

The spaces in the labs are spacious and expensive. The ZWYC-290A can be stacked up to 2-3 units high to offer multiplied incubation capacity on a single unit footprint. Stacking also can be easily managed at a later time. Each compartment unit operates independently with cooling, TFT touch screen control panel, intelligent precise control of temperature and shaking speed with "ramp and soak" programs and solid operating safety features with as standard, and can be upgraded with modular controlling options of, active humidity control, CO2 concentration controls.

This equipment is specially designed for the research experiment that involves microbiology, pharmacy and agriculture. It is widely used for cell culturing, hybridization, cell aeration, and solubility studies, etc.

Since the date of your purchase of this product, after-sale service will always be close to you through your local dealer and/ or the importing company of your region.

Anyhow, no matter what questions you have using our equipment; please do not hesitate to contact us.

LABWIT thanks you for your trust in this product!

2. SAFETY PRECAUTIONS

WARNING!

The section outlines the important safety precautions for both personnel protection and operation of the equipment. Negligence of the following instructions may lead to serious hazards and injury.

- The machine can be only operated by the trained and authorized person.
- The maintenance can be only conducted by trained person, LABWIT or its authorized agency.
- The maintenance spare parts shall be provided by the manufacturer and LABWIT, and users are not allowed to replace them without authorization.
- It's prohibited to use any materials that may cause overpressure, combustion or explosion in the equipment. Any uncontrolled cultivation of toxic or pathogenic organisms is not recommended for this equipment.
- The loading volume must not exceed 1/3 of the total volume of the flask.
- Reduce the loading or the shaking speed until the equipment runs smoothly, if loud noises or strong vibrations occur.
- Do not expose equipment to inappropriate ambient conditions, such as temperature, or humidity outside the stated operating range.
- The power supply of the incubator shall be well grounded so as to prevent operators from electric striking.
- The electrical supply circuit to the incubator must confirm to all national and local electric codes. Check the serial-data plate for voltage, cycle, phase and amperage requirements before you connect the unit.
- Do not pull out the plug when the unit is in use. Never drag on the wire to unplug the unit.
- A separate branch circuit is recommended to prevent loss of samples due to overloading or failure of other equipment on the same circuit.
- A surge protector is recommended to avoid power-related faults.
- In case of malfunction or burning smell, the unit must be unplugged immediately .Use a circuit breaker to cut off the power supply. Continuance of abnormal state will end up with fire as a result of overheating.
- The electric power supply must be cut off in following situations:
  - When the insulation is damaged.
  - When opening the door of electrical power box. Opening the top/back cover without cutting off power supply might result in electric shock.
  - When replacing the fuse. Replacing the fuse without cutting off the power supply will probably result in electric shock.
  - When a malfunction occurs, mishandling will result in the further damage of the equipment or accidental injury.
  - If you do not use the unit for a long period of time.
- Wear personal safety kits, such as safety glasses, safety gloves, when operating

temperature is above 50°C。

- Don't open the front door while the equipment is in operation. Make sure that all parts/shaking tray have stopped moving before opening front door.
- Always keep the work place clean and tidy to avoid possible health hazards.

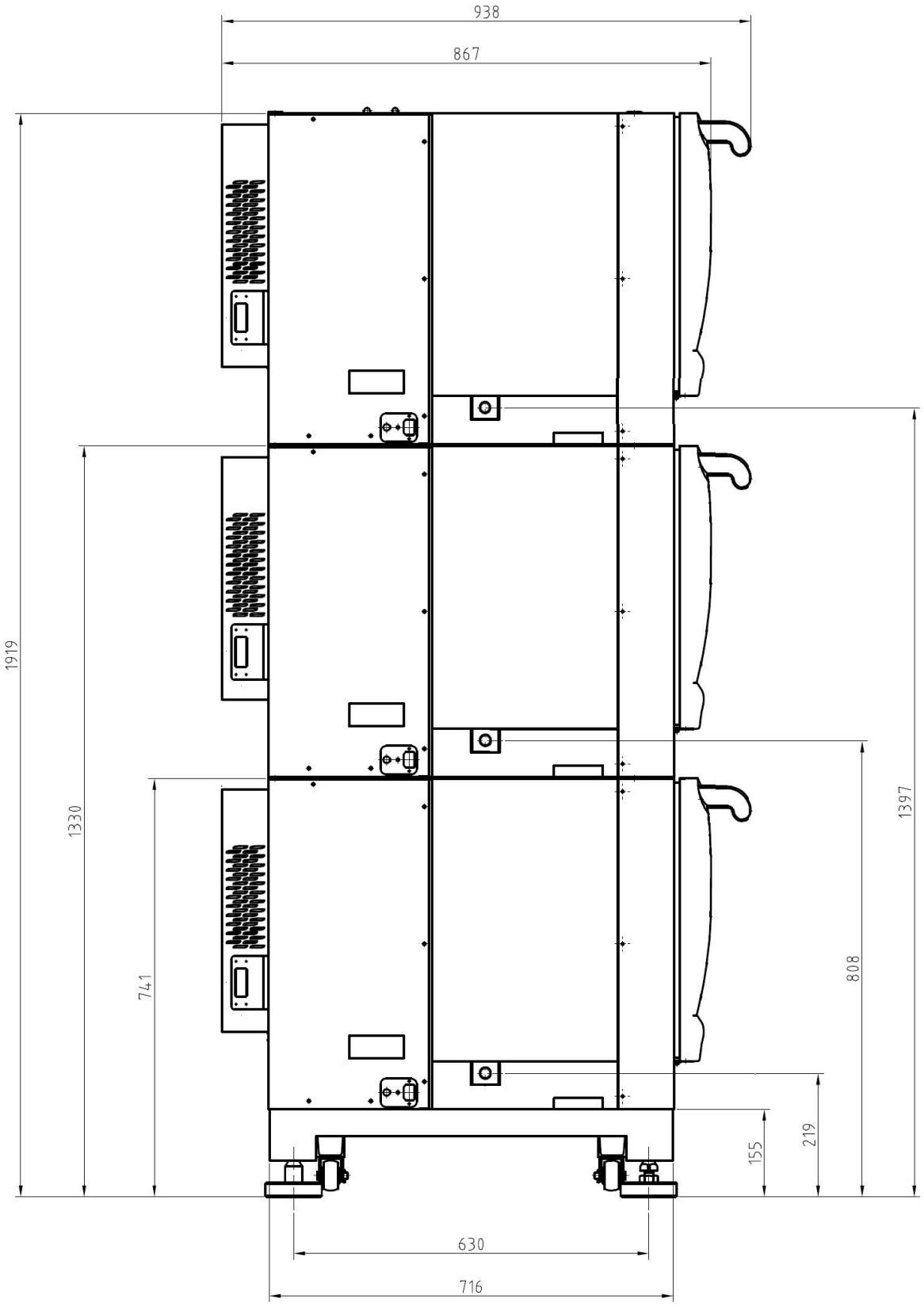
3. ENVIRONMENTAL REQUIREMENTS

- Best working temperature shall be 18°C--30°C, and humidity no more than 80%RH.
- In consideration of ventilation, heat dissipation and other factors, a minimum of 20 cm space shall be reserved in the surrounding of the equipment during installation to facilitate adequate convection of air around the unit.
- Indoor use only. Do not locate the unit exposed to direct sunlight or near heating /cooling ducts.
- The incubator shall be placed on a flat, solid and fire-retardant platform which can support its weight.
- The unit must be kept away from electromagnetic interference sources.
- There shall be no inflammable, explosive, corrosive, toxic or harmful gas that may cause sharp temperature change in the vicinity of the equipment.
- LABWIT only commits that the incubator can operate normally in the place where the elevation is less than 2000m.
- The power supply voltage of this equipment shall be allowed to change within ±10% of the rated working voltage.
- The transient over-voltage of the power supply shall be Class II.
- The pollution degree is Class II. Please keep the chamber clean. Regular cleaning is required.

4. TECHNICAL DATA

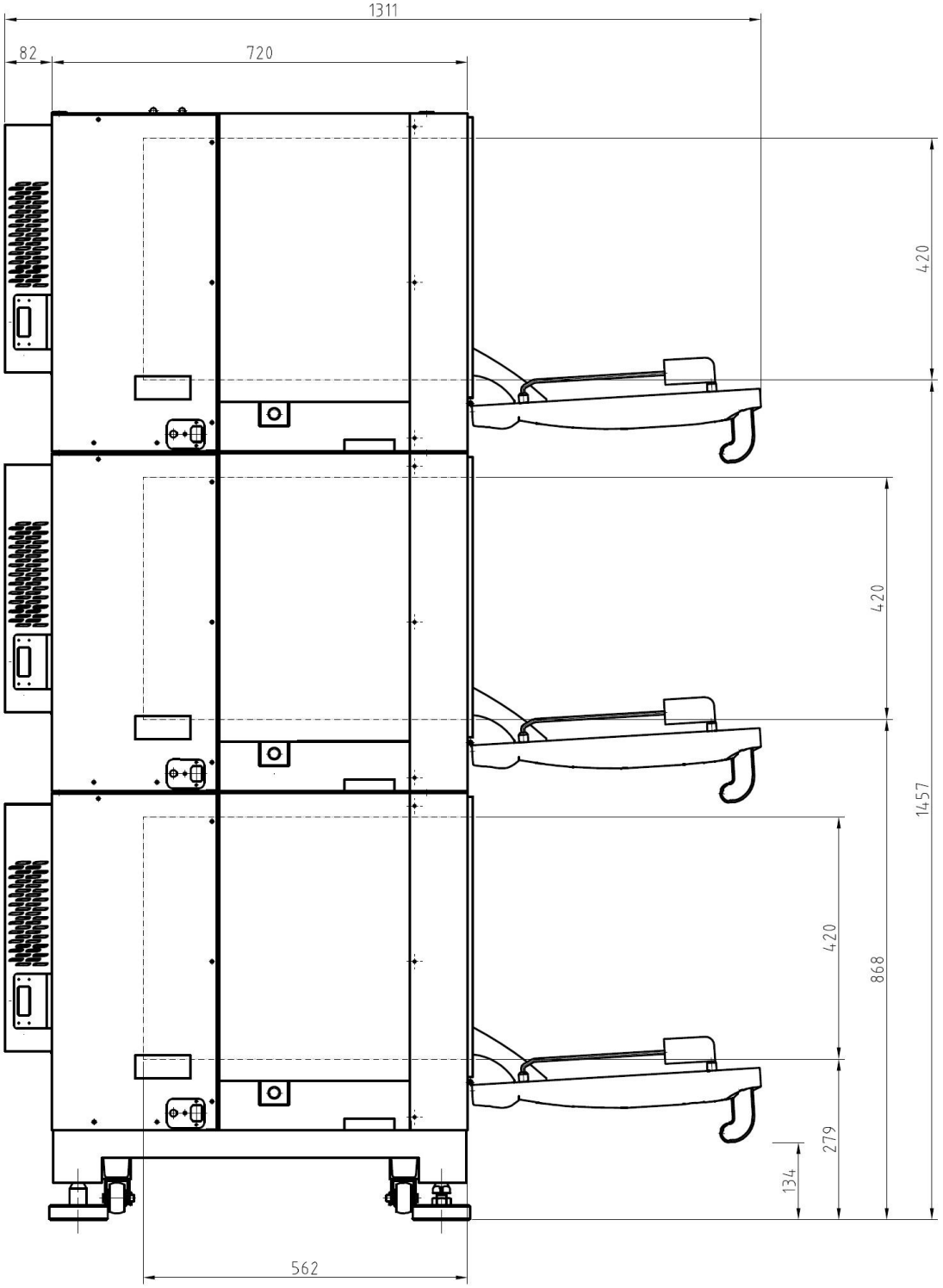
4.1 Dimensions:

- Side view of 3 units stacked with low base with doors closed



Picture. 1 (in mm)

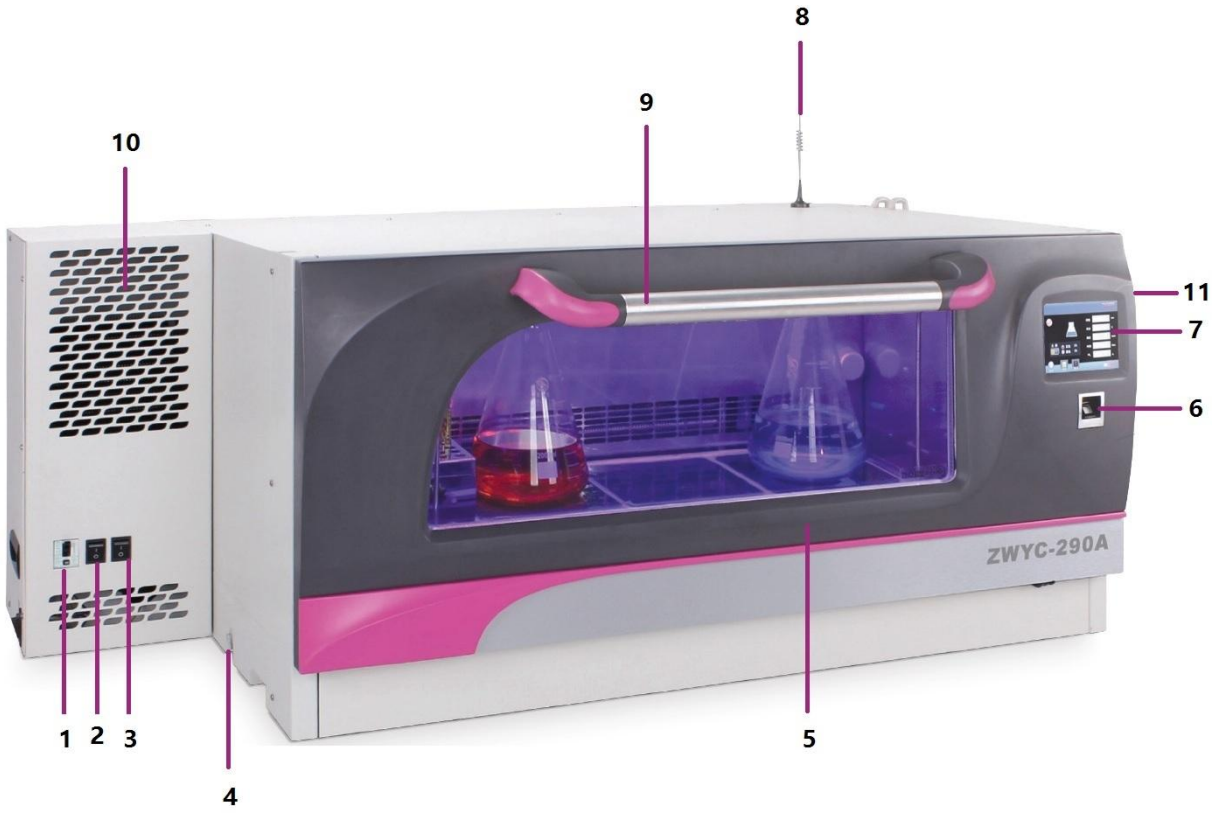
- Side view of 3 units stacked with low base with doors open



Picture. 2 (in mm)

4.2 Standard Functions

4.2.1 Main Unit



Picture. 3

1	Main Trip Switch	7	Control Panel
2	Illumination Light Switch	8	WiseKonect Plus^{TM} Antenna (Option)
3	UV Light Switch	9	Door Handle
4	Drain Outlet	10	Ventilation Holes
5	Door	11	USB Interface
6	Finger Printer Sensor (Option)		

4.2.2 Door

The elements on the door include

- Observation Glass Window
- Sliding bearing
- Tray Support Rails
- Illumination Light

4.2.3 Inner Working Chamber

- The elements inside the inner working chamber
- Stainless Steel Chamber Wall
- Shaking Mechanism
- Capillary Thermostat

- Ventilation Grilles (with cross flow fans behind the back wall)
- PT100 Temperature Sensor (behind the back wall)
- UV Sterilization Light (behind the back wall)

4.2.4 Shaking Control

Quin drive shaking system ensures smooth and reliable orbital shaking movement with a speed range between 30-300rpm. The orbital diameter is adjustable from 1mm to 50mm continuously. The loading weights must be low the maximum rated, otherwise, it will prevent the shaking tray from smooth movement, and eventually increase the wear out the bearings and joints.

4.2.5 Temperature Control

The heaters are behind the back wall. The temperature is controlled with a PT100 temperature sensor. The heat generated is distributed via 2 cross fan evenly across the inner working chamber. Over temperature protection is in place. The melting fuse switch off the heating at 85°C. In addition, the capillary thermostat protects the temperature overheating with adjustable range up to 120°C.

4.2.6 Control Electronics

The microprocessor controller is equipped in the front door. It is designed to service the precise control requirements of the working chamber environment, providing optimum programmable conditions for culture growth. The microcomputer is “user-friendly” with 5.6’’ large touch screen to permit efficient operator entry and settings of data.

Each stack of unit is operated independently its own controller.

4.2.7 Front Door & Shaking Tray Operation

The shaking tray of the equipment is locked in place while the door is closed. When the door is fully open, the locking hocks release the shaking tray and in the same time the releasing switch lifts the shaking tray out of the locking cones on the base tray.

Then the shaking tray can be pulled out over the tray support rails, and the sliding bearings on the door. Once the shaking tray is pulled out to the end, the shaking tray can be removed freely.

The shaking movement of the tray is interrupted as soon as the door is opened by more than 20° of angle. The shaking tray can only be ejected once the shaking tray stops completely. In the same time, the heater stops working at the same time when door is opened.

Shaking movement and heating controlling resumes once the door is closed.

DANGER!

MAKE SURE THE SHAKING TRAY IS COMPLETELY STOPPED BEFORE OPENING THE FRONT DOOR!

Failure of doing so will cause severe damage to the door locking system, hence door ajar alarm may be activated!

4.2.8 Shaking Speed and Shaking Diameter

The recommended speed range for different shaking diameters for multi stacking units are as below,

DANGER!
In case excessive vibration occurs during operation, stop the operation immediately, leveling the unit/s and reduce the shaking speed or shaking diameter.

Negligence of such vibration may cause severe hazards!

4.2.9 Specifications

Machine		Shaking Unit	
Outside (WxDxH)	1320x938x586mm (Side Cooling)*	Drive Type	Quin Drive System
Inside (WxDxH)	940x570x420mm	Tray Size	850x450mm
Volume	225L	Maximum Load	25kg
Weight (with Cooling)	200kg	Speed Range	30-300 rpm
Control Panel	TFT Touch Screen	Speed Accuracy	±1 rpm
Illumination	Halogen	Timer	0-9999 mins
Operation Menu in	English	Shaking Mode	Orbital
Ambient Temperature	5-35°C	Shaking Diameter	1-50mm stepless adjustment
UV Light	≥400 mW/m2		
Noise Level	<70 dB (1m above floor)	CO2	
Power	1150W	Principle of Sensor	Infared, NDIR
Electricity	AC 220-240 Volt, 50/60Hz	CO2 Range	0-20%
Fingerprint System	Option	CO2 Accuracy	±0.15 @ 5.0%
Temperature		Temperature Range	25-55°C
Control Mode	Fixed Value & Program	CO2 Supply Auto Switch	Option
Temperature Range	Ambient-15 to 60°C (Min. 4°C)#		
Temperature Accuracy	0.1°C	Photosynthetic Lighting	
Temperature Uniformity	±1.0°C @37°C	Light Type	LED, 50% Red, 50% Blue
Principle of Sensor	PT100	Spectrum	Red: 640-660nm, Blue: 430-450nm
Air Circulation	360m3/Hour	Light Intensity	13,000 Lux (Red: 6500 Lux, Blue: 6500 Lux)
Humidity			
Humidity Range	40-80%RH, at 25-55°C	Control	Yes, Individually, from 0-100% output
Humidity Accuracy	1%RH	Control Mode	Fixed Value & Programmable
Humidity Uniformity	±3%RH	Dimensions (WxDxH)	890x500x10mm
Principle of Sensor	Capacitive	Power	300W
Humidification Mode	Direct Steam Injection	* Without side cooling: 1080*870*590mm	
Water Heater	450W	# Min. 15°C when Photosynthetic Lighting option is applied.	

5. PREPARATION AND START-UP

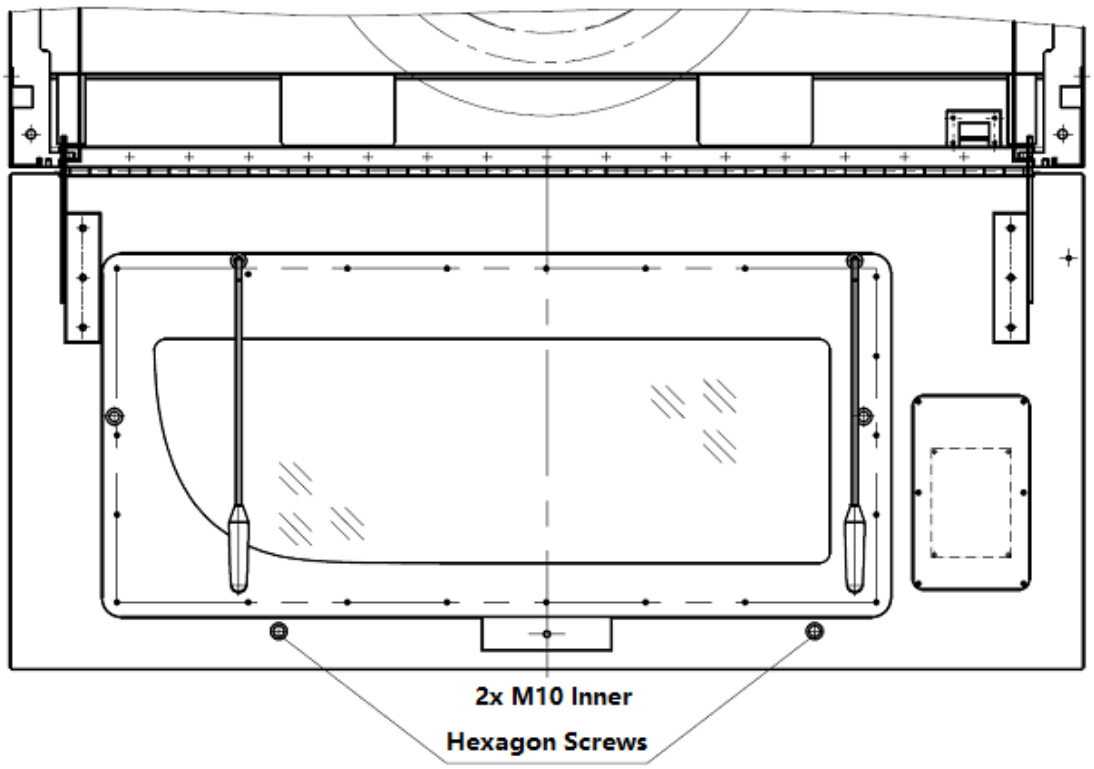
5.1 Unpacking

At delivery, examine the exterior for physical damage while the carrier's representative is present. If exterior damage is present, carefully unpack and inspect the equipment and all accessories for damage. If there is no exterior damage, unpack and inspect the equipment within five days of delivery. If you find any damage, keep the packing materials and immediately report the damage to the carrier. Do not return goods to the manufacturer without written authorization. When submitting a claim for shipping damage, request that the carrier inspect the shipping container and equipment.

5.2 Lifting / Handling

These units are heavy and care should be taken to use appropriate lifting devices that are sufficiently rated for these loads. Units should only be lifted from their bottom surfaces. Doors, handles and knobs are not adequate for lifting or stabilization. The units should be completely restrained from tipping during lifting and transport to prevent shifting and damage.

The depth of the incubator is 934mm, when moving the incubator through pathway, the door handle can be removed, so that the depth reduces to 867mm. To do so, please follow the below instructions,



- Open the front door to "half" open position.

DANGER!

- Don't use force to open the door to full open position when the unit is powered off.
- Excessive force will cause damage to the door.

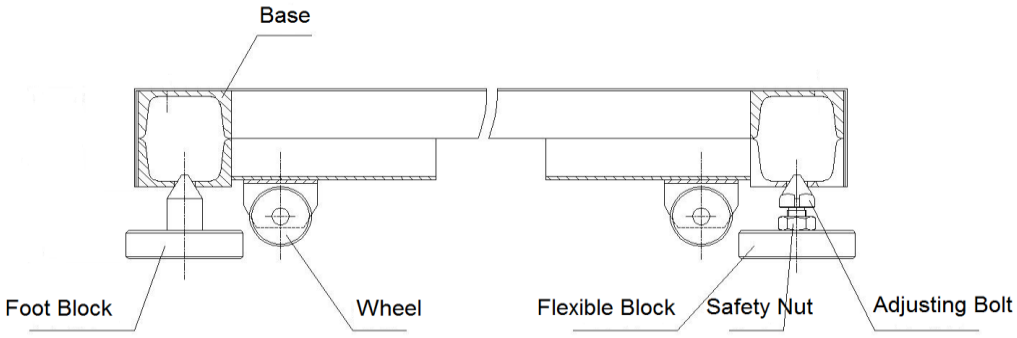
- Remove the two caps on the door,
- Use the Allen key (not supplied) to unscrew the 2 x M10 Hexagon screws
- The door handle can now be removed.

5.3 Leveling the Units

5.3.1 Before starting your equipment, the unit must be placed horizontally on a solid, flat floor, and elevated and leveled with three foot blocks and one flexible block (with adjustable bolt). The foot blocks are provided to level as well as "fix" the unit firmly on the floor. To allocate the blocks in position, please do strictly follow the below procedures:

Safety instruction!

Please be sure to follow the instructions, which are really important for your safety.



5.3.2 Unscrew the safety nut on the flexible block first, screw down the adjusting bolt of the flexible block, so that it will leave some gap when it fits underneath the hole on the base.

5.3.3 There is one hole on each corner of base of the unit, locate each of them.

5.3.4 Use lifting tools to elevate the unit, and place the four foot blocks right underneath the holes on each corner.

5.3.5 Lay down the unit, check and adjust the potions of the foot blocks and make sure the tips of the blocks sits firmly in the holes. Make sure hands off the unit before the unit is laid down! Do be careful of your hand!

5.3.6 Use a spanner to unscrew the adjusting bolt, raising the height of the flexible block, until feeling some strength, and the tip of the bolt sits firmly in the hole.

5.3.7 Make sure the unit is elevated leveled and sits firmly on the four blocks. Try setting the unit at its medium speed, e.g. 150rpm, slowly increase the speed and adjust the adjusting bolt until no vibration is detected.

5.3.8 Finally screw the safety nut of the flexible block, lock up the adjusting bolt.

5.4 Preliminary Cleaning

Each new equipment was thoroughly cleaned prior to leaving the factory. It is recommended; however, before installation, LABWIT recommends decontaminate all surfaces within the interior chamber, outer door and gasket. They can be wiped down with a disinfectant of 70 percent alcohol or similar non-corrosive antimicrobial agent. After cleaning, dry all interior

components with a sterile cloth as necessary. **Absolutely no chlorinated or halogen materials are to be used in the chamber.**

5.5 Electrical

Each unit is equipped with a trip switch to avoid power-related faults. Whereas, the electrical supply circuit to the incubator must conform to all national and local electrical codes. Plug the power plug securely into a grounded power source. VOLTAGE SHOULD NOT VARY MORE THAN 10% FROM SERIAL PLATE RATINGS. A separate branch circuit is recommended to prevent possible loss due to overloading or failure of other equipment on the same circuit.

5.6 Connect the Power Supply

Connect AC power via power wire, turn on the trip switch to start up the equipment after the connected power supply meets the above stipulated requirements.

5.7 Installation of Flask Clamps (Applies P6022 predrilled tray)

The tray is predrilled with threaded holes for different sizes of **Erlenmeyer flask clamps***. To install the clamps onto the platform tray, please follow the instructions below,

- Stop the unit from shaking and pull out the platform tray
- Use the screw driver to fix the O clamps with screws onto the platform. (Flask Clamp≥1000ml, 4 screws at corners, Flask Clamp<1000ml, 1 screw in the center)
- Please make sure all screws are securely fastened before turning the unit back on.

  * Only use Labwit "O Clamps" for this tray.
- Maximum loading capacity with P6022 predrilled tray

Flask (Pcs)	50ml	100ml	250ml	500ml	1000ml	2000ml	3000ml	5000ml
Max capacity	91	70	40	26	15	11	8	5

For Erlenmeyer Flasks only. Flask dimensions may reduce max. capacity

5.8 Installation of Sticky Mat (Applies P6023 plain tray)

The tray is specially designed for use with Labwit Sticky Mats. The Sticky Mat is used for attaching vessels, such as flasks, bottles, dishes etc onto the shaking platforms for all shaking equipments, for example, shakers, rockers as well as shaking incubators. It is as standard 20 x 20 cm in size and can be used to cover the shaking platforms replacing the traditional flask clamps. The Sticky Mat can be easily removed and repositioned by simply peeling off the shaking tray surface. With proper care, the Sticky Mat can be used for several years.

- Before installing the Sticky Mat, clean the surface of the platform tray, making sure the platform is completely undamaged, clean and oil-free.
- Moisturize the platform tray by spray bottle or wet towel.
- Remove one of the two plastic sheet covers of the Sticky Mat. Dip the sticky mat with water.
- Install the Sticky Mat onto the platform tray. Use the ruler or hard card to scrape and squeeze out all the water and bubbles.

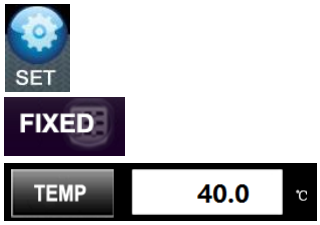
- Wait for 12 hours and peel off the top sheet cover.
- The Sticky Mat is now ready for loading.
- Maximum loading capacity with P6023 plain tray with Sticky Mats

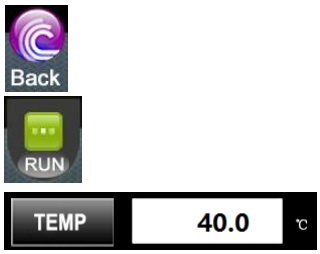
Flask	50ml	100ml	250ml	500ml	1000ml	2000ml	3000ml	5000ml
Max Load	98	72	50	32	18	11	8	6

For Erlenmeyer Flasks only. Flask dimensions may reduce max. capacity

5.9 Set of Capillary Thermostat

The capillary thermostat inside the working chamber works as a protection against over temperature. It has a temperature set range of up to 120°C. It is set at "80°C " as default.





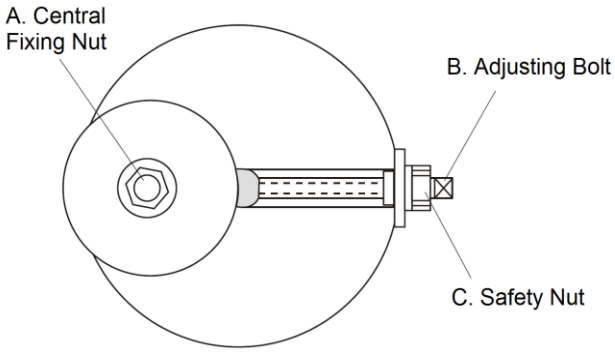
- Set the thermostat to 65°C.
- Switch on the main unit and press "Set" key
- Press the "FIXED"
- Press "Temp" to set the temperature to the maximum working temperature, e.g."40.0"°C
- Press "Back" to the home page.
- Press "Run" to start the temperature control system
- Wait until the displayed temperature in the home page reaches the set temperature.
- Open the door, turn the thermostat knob anti-clockwise slowly until hearing a clicking sound from the thermostat.
- Turn the thermostat knob clockwise 5°C higher.
- Now the thermostat is set, and always set the thermostat some °C higher than the maximum working temperature to ensure continuous operation.

5.10 Operation of Shaking Diameter Adjustment

The incubator has an adjustable shaking diameter of Ø1-50mm. To adjust it, follow the instructions below,

Attention:

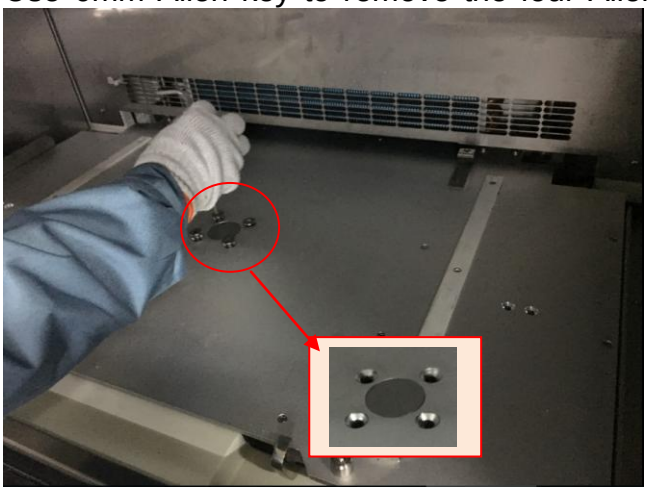
Power supply must be disconnected before performing the following operations!



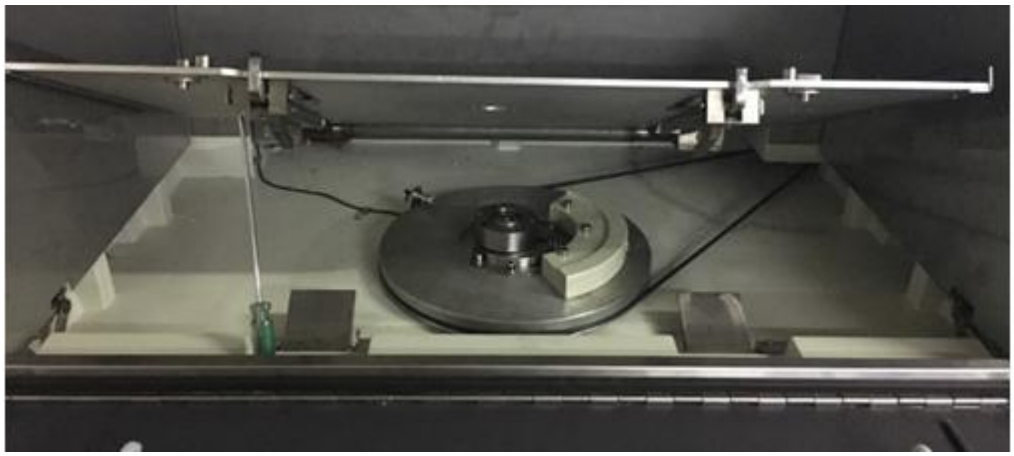
5.10.1 Tools needed: 17*19 spanner, 8*10 spanner, Allen key 6mm, Allen key 8mm

5.10.2 Turn off the unit, open the glass door, pull out and remove the shaking tray,

5.10.3 Use 6mm Allen key to remove the four Allen screws from the base tray.



5.10.4 Lift the base tray and support it with a long object, until seeing the center of the shaking mechanism (as illustrated)



5.10.5 Use the 8mm Allen key to loosen the (A) central Allen screw.

5.10.6 Loosen the (C) safety nut with 17*19 spanner


5.10.7 Use the 8*10 spanner to rotate the (B) adjusting bolt clockwise to decrease the shaking diameter, but anti-clockwise to increase.


5.10.8 When adjustment is done, tighten the (B) adjusting bolt and (A) central Allen screw.

5.10.9 Install the base tray and shaking tray back in place.

Attention:

The maximum shaking speed should decrease when the shaking diameter is increased. Please see the chart below for the chart of ratio between speed and shaking diameter.

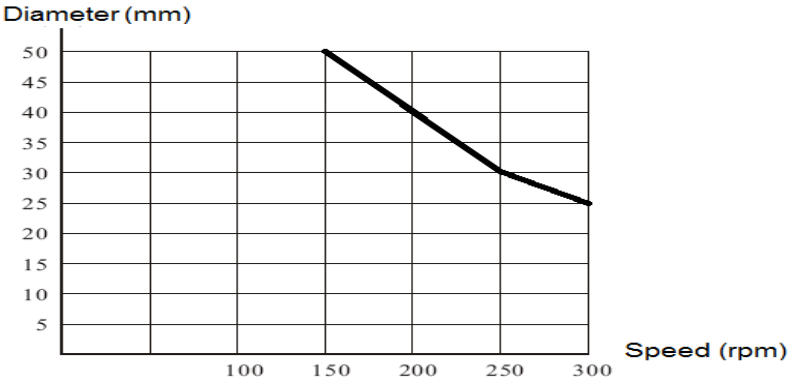


Chart of Ratio Between Speed and Shaking Diameter

5.11 Extra For Refrigerated Units

ATTENTION:

The nominal cooling capacity can only be reached if the ambient temperature at the cooling aggregate is below 30 °C.

After transport or moving –DO **NOT** USE this unit for at least **24 Hours, unless you are a 100% sure that the unit has been moved in an upright position only**.

If the equipment is continuously used at low temperatures, condensate can occur inside of the incubator. It is recommended that you wipe condensations out, or-if possible-heat up the incubator to evaporate this small amount of condensation once every 10 days of operations.

To extend the compressors life and to maintain an excellent performance of your refrigeration system, the condenser of the unit should be cleaned every month.

Clean the shaking incubator before you put it into use and on a regular base. The interior should be wiped down with an appropriate disinfectant, such as 70 % ISOPROPYL ALCOHOL or equivalent.

**DO NOT USE ANY CHLORINATED OR HALOGEN MATERIAL-
AS THIS IS HARMFUL TO THE POLISHED STAINLESS STEEL!!!**

5.12 Installation of Direct Steam Humidification System (Option)

ATTENTION!
Use only distilled or deionized water. Using water outside this range will void your warranty.

Before starting operation, the direct steam humidification system must be connected to unpressurized water tank or a pressurized water source with inlet pressure not exceed 0.3 bars.

To connect the feed hose to the system, insert the hose into the connector as much as it goes.

5.13 Installation of CO2 gas supply hose (Option)

The inlet nozzle for CO2 gas supply is on the right side of the case wall. To connect the CO2 gas supply hose to the nozzle, make sure:

- Inlet pressure not exceed 3.0 Bar. (2.0 Bar recommended)
- Gas supplied must be dry, clean, dust and oil free.
- The hose must remain intact and pressure resistant.
- Keep the hose secured by a hose clamp.

6. OPERATING THE UNIT

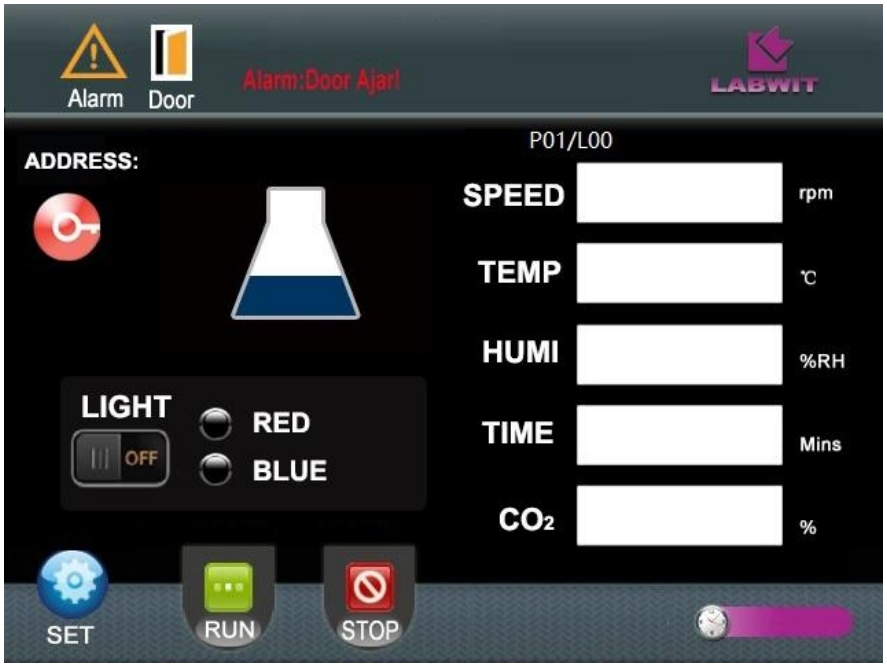
Once the equipment is properly installed with all utilities connected, turn on the power switch on the left of the equipment.

When power is applied, the incubator will first display the "welcome page" and then LCD will display the "home page" when the system is under working conditions.

Afterwards, user can set parameters via setting menus. After users confirm the setting of parameters, the incubator can start controlling the general parameters, such as temperature, speed, as well as the relative humidity (Option) and CO_2 concentration at the value set by the user.

Welcome Page

6.1 Home Page Summary



“Stop” button:
Press this to stop the operation. When the incubator is in operation, press this button to pause. Press it again, to stop the current operation.

“Run” button:
Press this button to start the operation. When the unit is paused, this will twinkle; press it again to resume the operation

“Set” Button:
Press it to enter the Set Menu page Settings. See 6.2 Set Menu Page Summary.

“Clock Time” Display:
It displays the actual clock time.

“Alarm” Status:
Once the conditions of alarms are fulfilled, the alarm is declared, and indicator will be lighted.

“Door” Status:
This indicator will be lighted if door is opened or closed improperly.

"Address" Status
This indicates the current serial address when the incubator is connected to any communication protocols, e.g. RS-485. See 6.10.2 RS485 Communication Address Setting Option

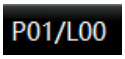
"Door Lock" Button
Press it to enter the password and unlock the front door. See 6.10.1 RS485 Communication Address Setting Option

“Shaking Flask” Status:
The illustration of “flask” indicates the status of the unit; the flask remains still when unit is stopped; or keeps swinging when it’s shaking.

Photosynthetic Lighting Switch
Press it to enable or disable the photosynthetic LED lighting function.

Red Light Indicator
The indicator lit when the red light is on, with display of current lighting output value in percentage.

Blue Light Indicator
The indicator lit when the blue light is on, with display of current lighting output value in percentage.



“Control Mode” Status:
This box indicates the status of the current control mode, fixed value mode or programmable mode.
If it is controlled under Fixed Value mode, no display.
If it is controlled under Programmable mode, it displays the current segment number and remaining cycle times.

Special Remind!

Under programmable mode, the “SEG” box shows as followings,
P”m”/L’’n”,
m: Current segment No.
n: Remaining cycle times.

“Speed” Display:
It displays the current operating speed in rpm.

“Temperature” Display:
It displays the current operating temperature in °C.

“Humidity” Display:
It displays the current operating relative humidity in RH%.

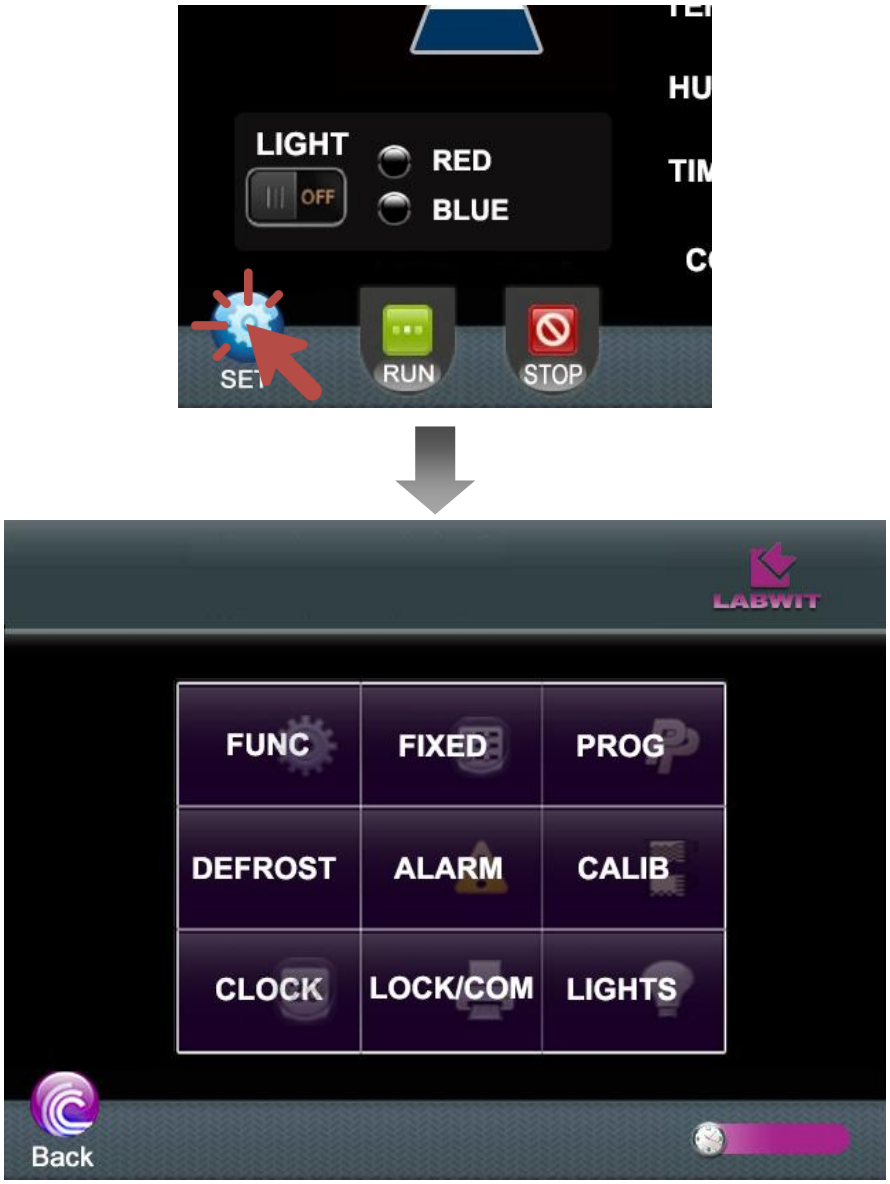
“Time” Display:
It displays current accumulative running time in minutes.

“CO_2” Display:
It displays the current operating CO_2 concentration in %

6.2 Set Menu Page Summary

The Set Menu page is the key gateway for accessing the collection of functions for the incubator operations.

The Set Menu page are accessible by pressing the “Set” icon in the home page.



Key Name	Functions	Related Chapter
FUNC	Switches of all functional modules, and control models	6.3
FIXED	Settings of operating parameters for fixed value control mode	6.4.1
PROG	Settings of operating program for programmable control mode.	6.4.2
DEFROST	Settings of parameters for defrost function	6.8

Key Name	Functions	Related Chapter
ALARM	Settings of deviations for all operating parameters for alarm conditions	8
CALIB	Calibrating Temperature, Speed, Humidity and CO_2%	7
CLOCK	Settings of the real clock time	6.9
LOCK/COM	Switch of door lock system, password setting, communication address setting.	6.10
LIGHTS	Settings of photosynthetic lighting functions	6.5

6.3 FUNC Page Settings

Under the FUNC page, control modes and other functional modules can be changed or switched easily with finger touches.

The FUNC page are accessible by pressing the “FUNC” icon in the "SET" page.

6.3.1 Switch of Control Mode - Temperature & Speed

The incubator can be set to run with fixed functional parameters settings, or with program up to 9 different segments, each with their own Ramp Time, Ramp End Temperature, Hold Time and Speed.

To select between Fixed Value mode and Programmable mode, follow the below steps,

- Press "Stop" button in the home page to stop the current operation.
- Enter "FUNC" page.
- Press the "TEMP MODE" to switch the mode between "FIXED" and "PROG".

Special Remind!

Make sure the unit is stopped (by pressing “STOP”) before changing the state of “TEMP MODE".

6.3.2 Switch of Keep Function-Temperature Holding Function

This function will enable or disable the system to keep constant temperature, humidity and CO_2 control at the setpoint once the timer runs out under fixed value control mode, or at the setpoints of last segment under programmable control model. If it is disabled, temperature, relative and CO_2 would be no longer under control as shaking motion stops.

To switch this function, follow the below steps,

- Press "Stop" button in the home page to stop the current operation.
- Enter "FUNC" page.
- Press the "KEEP" to enable/disable the temperature holding function

6.3.3 Option Switch of Direct Steam Humidification Function

This function will enable or disable the direct steam humidity control system.

To switch this function, follow the below steps,

- Press "Stop" button in the home page to stop the current operation.
- Enter "FUNC" page.
- Press the "HUMI FUNC" to enable/disable the direct steam humidity function.

6.3.4 Option Switch of CO2 Gas Control Function

This function will enable or disable the CO2 gas control system.

To switch this function, follow the below steps，

- Press "Stop" button in the home page to stop the current operation.
- Enter "FUNC" page.
- Press the "CO2 FUNC" to enable/disable the CO2 Gas control function.

6.3.5 Option Switch of Photosynthetic Lighting Control Function

This function will enable or disable the photosynthetic lighting control system.

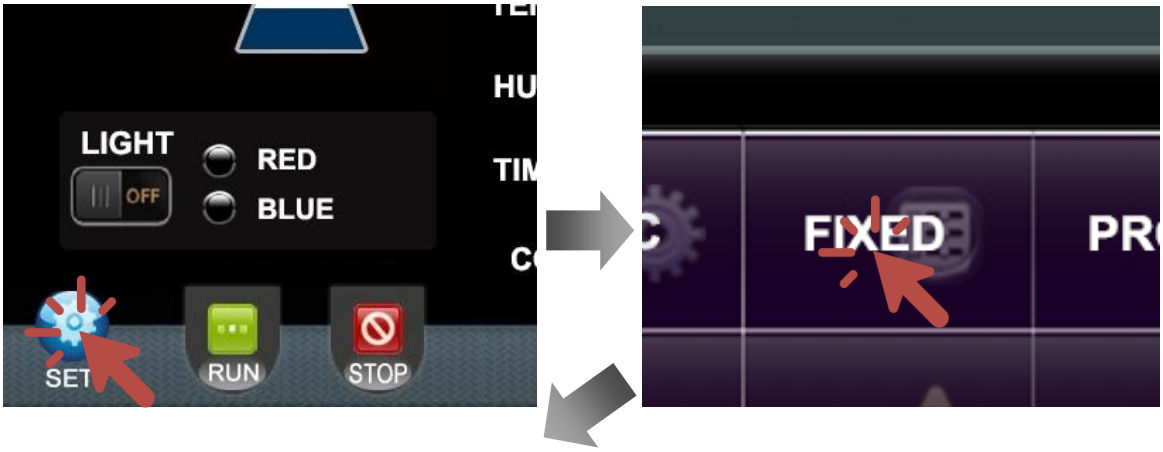
To switch this function, follow the below steps,

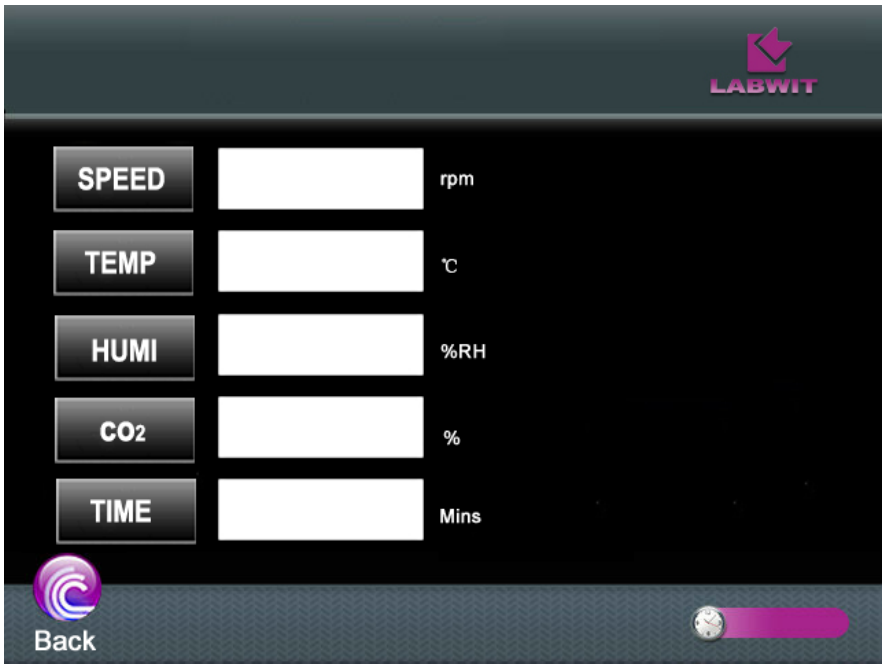
- Press "Stop" button in the home page to stop the current operation.
- Enter "FUNC" page.
- Press the "LIGHT FUNC" to enable/disable the photosynthetic lighting control function.

6.4 Operating Temperature and Speed System

6.4.1 Operating Under Fixed Value Control Mode

Under fixed value mode, the incubator controls constantly with fixed setting values of general functional parameters, such as shaking speed, temperature, humidity, CO2, and timer.





To set the general parameters under fixed value control mode, follow the below steps,

- Press "Stop" button in the home page to stop the current operation.
- Switch the "TEMP MODE" in the "SET" page to "FIXED" mode. Press "SET" in the home page.
- Press "Fixed" in the "SET" page to start setting the general parameters (Excluding Photosynthetic Lighting)

SPEED—Speed Set button

Press it and use the keyboard to enter the speed set value, and press “OK” to confirm and save. Set range from 30-300rpm.

TEMP—Temperature Set button

Press it and use the keyboard to enter the temperature set value, and press “OK” to confirm and save. Set range 4.0-60.0°C.

HUMI— Humidity Set button

Press it and use the keyboard to enter the relative humidity set value, and press “OK” to confirm and save. Set range 40-80%RH

CO2— CO2 Gas Set button

Press it and use the keyboard to enter the CO2 gas concentration set value, and press “OK” to confirm and save. Set range 0-20%.

TIME—Timer Set button

Press it and use the keyboard to enter the timer set value, and press “OK” to confirm and save. Set range:0-9999mins

Back—“Return” Button

Press it to exit the current page after all settings are finished.

- **Start the operation:** Press the "RUN" button in the home page to start the fixed value operation , the "Shaking Flask" icon will start swing. The shaking motion of the shaking tray can be observed through the front window. The temperature, humidity, CO2 concentration controls start functioning to reach their setpoints. Time starts counting.
- **Pause the operation:** During the operation, the incubator can be paused by pressing the "STOP" button. Once it pauses, the "RUN" button keeps twinkling, the shaking tray stops shaking motion, the timer pauses counting. But the temperature, humidity and CO2 concentration remains under control. Press the "RUN" button to resume the current operation under fixed value mode.
- **Stop the operation:** When the operation is paused, press the "STOP" button once again, it will stop the current operation. Once it's stopped, the "Shaking Flask" stops, the "RUN" button dims, the shaking tray stops shaking motion, the timer stops and will be reset.

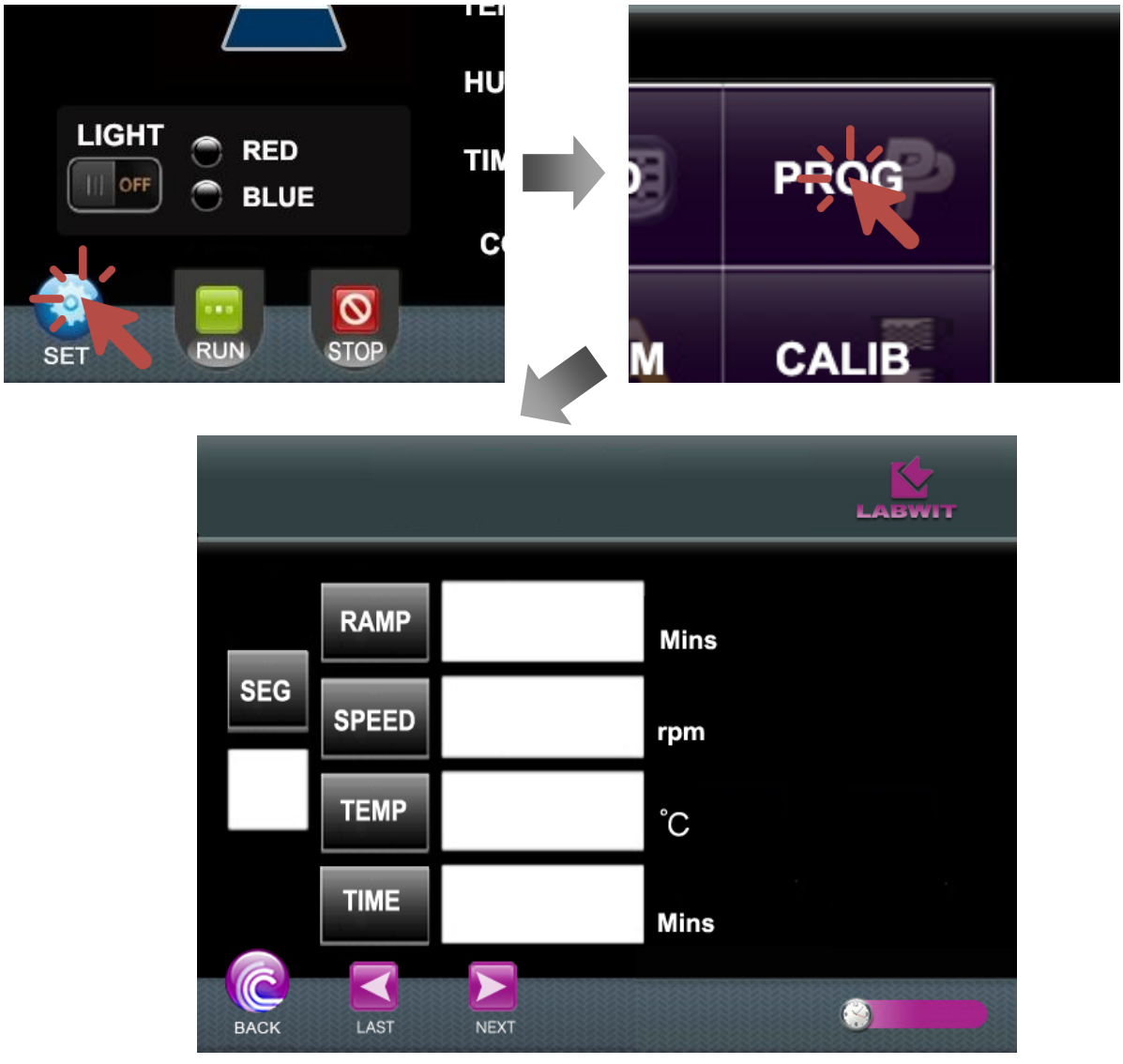
  The temperature, humidity and CO2 concentration controlling will also be

switched off. However, if the "KEEP" in the "FUNC" page is switched on, these functions will remain under control at their setpoints even when the operation is stopped.

	**Special Remind!** ◆ If the entered value exceeds the maximum limit, then the max value will be set at its maximum value. ◆ Press the “C” on the key board to clear the entry. ◆ Setting of each parameter must be confirmed and saved by pressing “OK” button.

6.4.2 Operating Under Programmable Control Mode

This incubator can operate according to stored program to meet various requirements of professional experiments. Under programmable control mode, it can be programmed to save up to 9 different segments, each with their own Ramp Time, Ramp End Temperature, Hold Time and Speed. At the end of the settings, set the Hold Deviation and Cycle Times to complete the settings.



To set the general parameters under "Programmable" control mode, follow the below steps,

- Press "Stop" button in the home page to stop the current operation.
- Switch the "TEMP MODE" in the "SET" page to "PROG" mode. Press "SET" in the home page
- Press "PROG" in the "SET" page to start setting the general parameters (Excluding Photosynthetic Lighting)

SEG—Segment No.

The function indicates the serial number of current segment. No setting required.

RAMP—Ramp Time

This function indicates the time duration required for temperature to reach from current actual value to the ramp end (temperature) value. Use the keyboard to enter the ramp time from 0-999.9mins.

SPEED—Segment Speed

This function indicates the speed set for the segment. Use the keyboard to enter the segment speed from 30-300rpm.

TEMP-Ramp End Temperature

This function indicates the ideal temperature value for the unit to reach for the segment. Use the keyboard to enter the ramp end temperature from 4-60°C.

HOLD—Hold Time

This function indicates the time of hold step, which is the length of time that the unit has to maintain the (Ramp End) Temperature for the segment. Use the keyboard to enter the hold time from 0-999mins.

LAST—"Last" Button

Press it to return to the set page of previous segment.

NEXT—"Next" Button

Press it to forward to the set page of next segment.

Setting a Termination Point for Your Program!

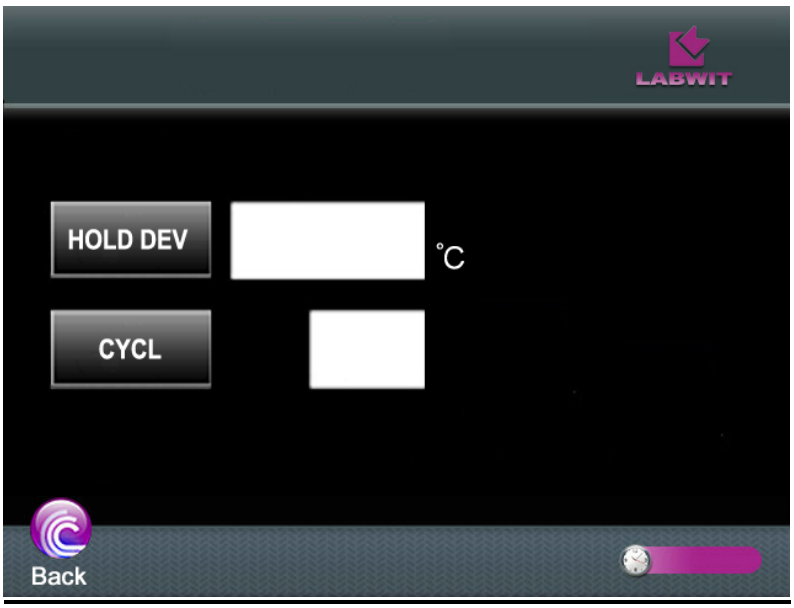
The program can run with up to 9 segments. However, if the total number of segments are less than 9, it is necessary to set a termination point for the program.

To do so, please set the "Ramp" time of the next unused segment as "End" or "Cycle (Step)" by pressing "Decrease" button when the "Ramp" indicator is showing as "0".

By setting as "End", the program will finish in here.

By Setting as "Cycle (Step)", the program will keep running according to the "Cycle times" setting (See below)

Once the termination point is set, keep pressing “NEXT”, until the following page appears.

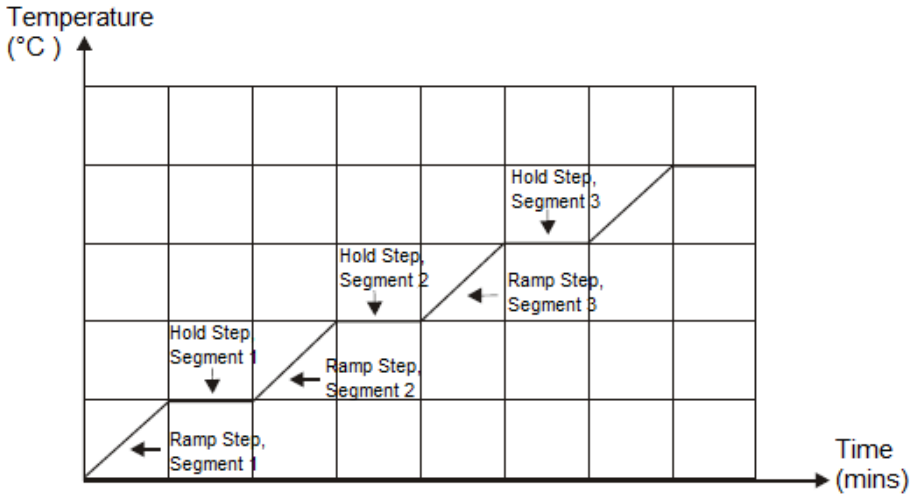


HOLD DEV—Hold Deviation

This function indicates the temperature deviation that the incubator may have at the end of each” Ramp Time” before starting the “Hold Time”, in another word, the difference between actual temperature and desired “Ramp End Temperature”, which activates the “Hold Time”. If it’s set as “0”, “Hold Time” will start counting down as soon as the “Ramp Time” dues. Use the keyboard to enter and press “ENT” to confirm and save.

CYCL—Cycle Times

This function indicates the number of times for the whole program to run repeatedly if the whole program has a termination point as "Cycle (Step)", if it’s set as “1” cycle, the program will run for 1 repeat, so a total of 2 times! Use the keyboard to enter between 0-99 times.



Once the program settings are saved, the unit is ready for "Programmable" control mode.

- Start the operation: Press the "RUN" button in the home page to start the programmable operation , the "Control Mode" status shows the "Pxx/Lxx", the "Shaking Flask" icon will start swing. The shaking motion of the shaking tray can be observed through the front window. The temperature control starts from the "Segment 1". Time starts counting from the "Ramp Time" of "Segment 1".
- Pause the operation: During the operation, the incubator can be paused by pressing the "STOP" button. Once it pauses, the "RUN" button keeps twinkling, the shaking tray stops shaking motion, the timer pauses counting. The temperature remains under control at the setpoint at the time of the pause operation. Press the "RUN" to resume the current operation under programmable mode.
- Stop the operation: When the operation is paused, press the "STOP" button once again, it will exit the current program operation. Once it's stopped, the "Shaking Flask" stops, the "RUN" button dims, the shaking tray stops shaking motion, the timer stops and will be reset.
- The temperature controlling will also be switched off. However, if the "KEEP" in the "FUNC" page is switched on, the temperature will remain under control at their setpoints even when the program operation is stopped.

6.5 Operating Photosynthetic Lighting System

The photosynthetic lighting system features LED lighting panel with specific light spectrums that is most productive for algae growth. The standard light panel generate blue and red lighting. White LED light option provides similar lighting spectrum like daylight.

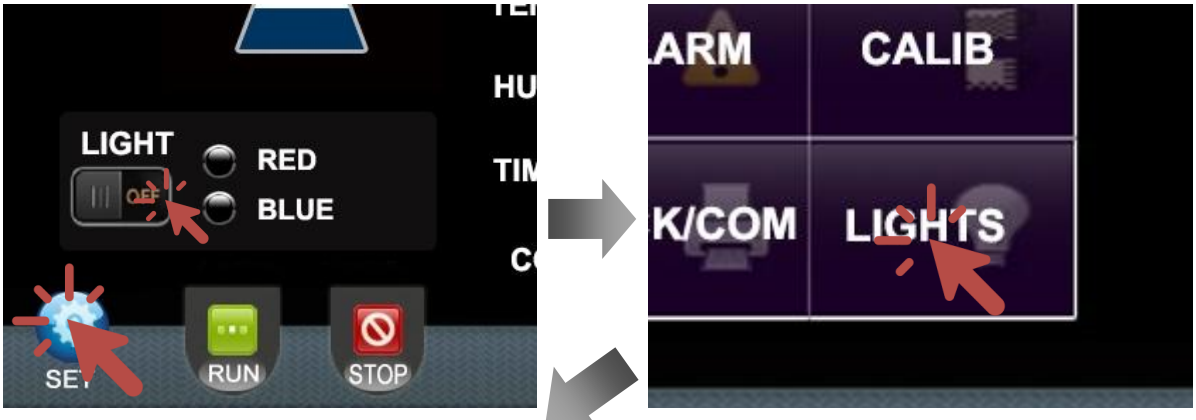
Each color of the light can be controlled under fixed value mode, or programmable mode, which runs day/night cycles.

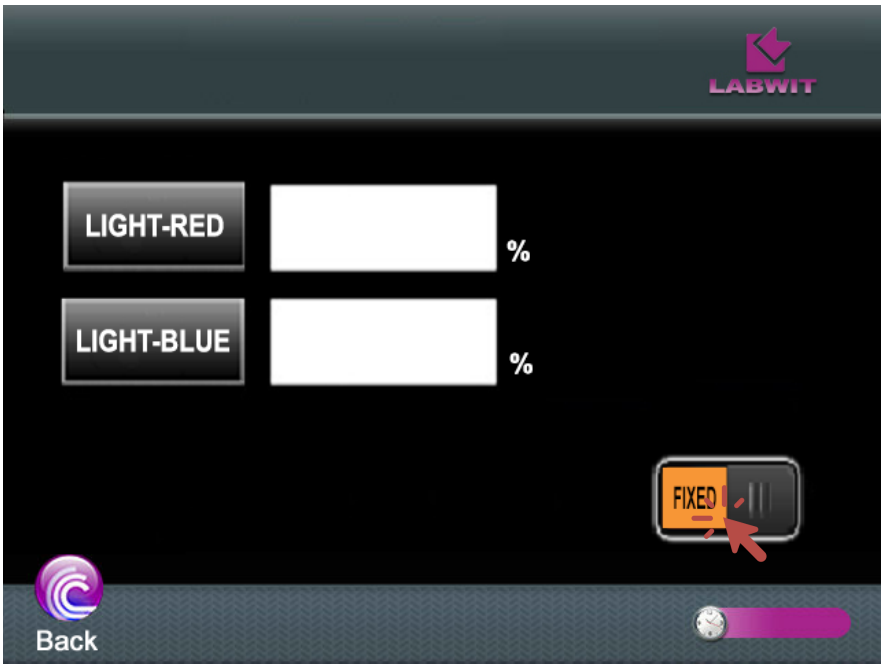
Each color light intensity can be set with the range of 0-100% power output.

The lighting panel is protected by acrylic housing, which makes it easy to clean and water proof.

6.5.1 Operating Under Fixed Value Control Mode

There is an individual set page for photosynthetic lighting system, which include settings under both Fixed Value and Programmable control mode.





To set the lighting outputs of under "Fixed Value" control mode,

- Press "SET" in the home page
- Press "LIGHTS" in the "SET" page to start setting the photosynthetic lighting system
- Press the switch to switch the control mode to "FIXED"

LIGHT-RED — Red Light Output button

Press it and use the keyboard to enter the red light output set value, and press “OK” to confirm and save. Set range 0-100%.

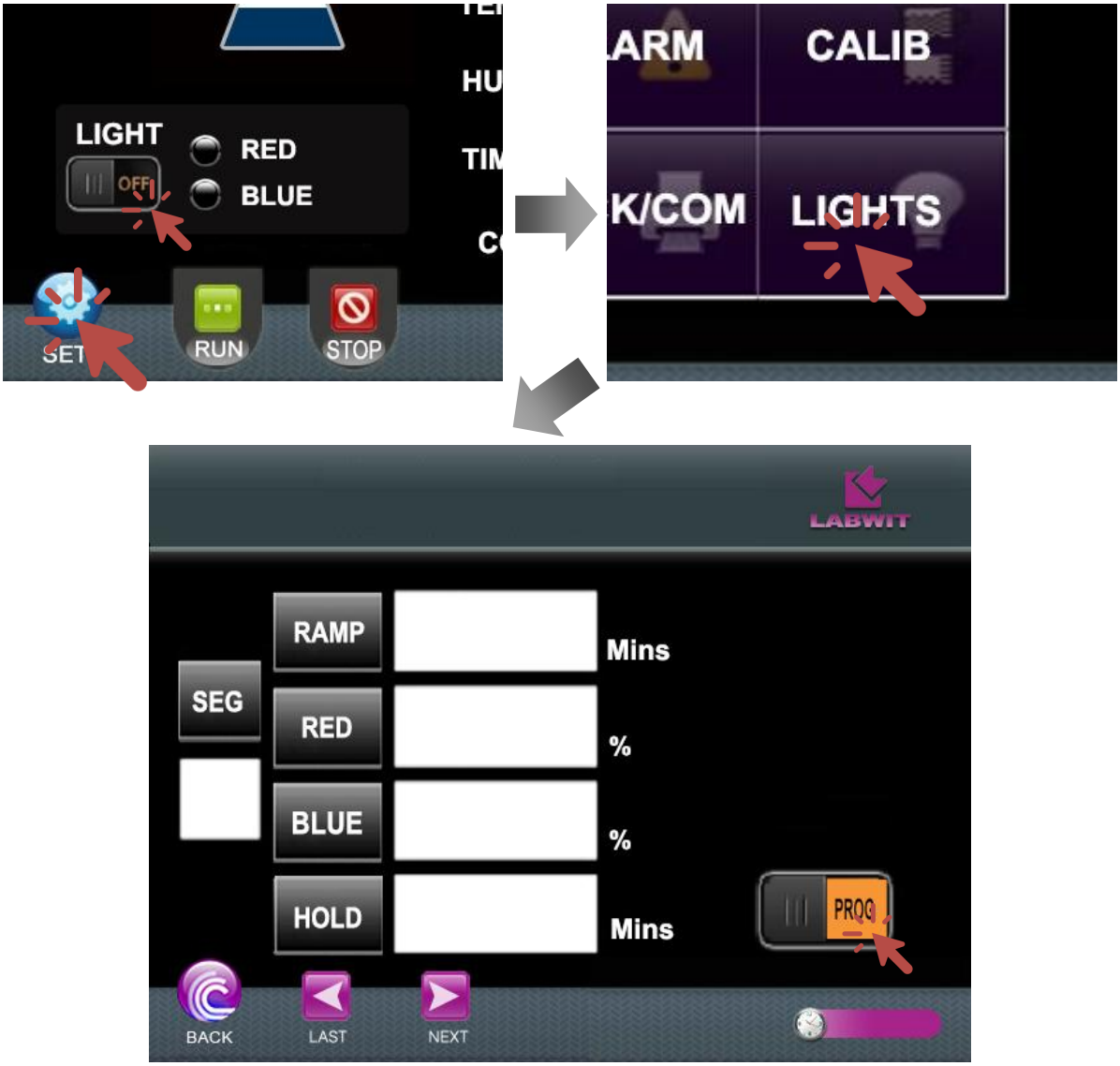
LIGHT-BLUE — Blue Light Output button

Press it and use the keyboard to enter the blue light output set value, and press “OK” to confirm and save. Set range 0-100%.

- Switch the "LIGHT MODE" in the "SET" page to "FIXED " mode.
- Press "LIGHT" switch in the home page to switch "ON" the lighting system.
- Press the switch again to switch "OFF" the lighting system.

6.5.2 Operating Under Programmable Control Mode

With the "Programmable" control mode, the photosynthetic lighting system can simulate and run day/night cycles. Together with the other operating parameters, the incubator can create reproducible conditions of "natural" environment.



To set the lighting outputs of under "Programmable" control mode,

- Press "SET" in the home page
- Press "LIGHTS" in the "SET" page to start setting the photosynthetic lighting system
- Switch the control mode to "PROG"

SEG—Segment No.

The function indicates the serial number of current segment. No setting required.

RAMP—Ramp Time

This function indicates the time duration required for temperature to reach from current actual value to the ramp end (temperature) value. Use the keyboard to enter the ramp time from 0-999.9mins.

RED—Ramp End Red Light Output button

This function indicates the ideal red light output for the system to reach for the segment. Use the keyboard to enter the ramp end red light output from 0-100%.

Blue—Ramp End Blue Light Output button

This function indicates the ideal red light output for the system to reach for the segment. Use the keyboard to enter the ramp end red light output from 0-100%.

HOLD—Hold Time

This function indicates the time of hold step, which is the length of time that the unit has to maintain the (Ramp End) light outputs for the segment. Use the keyboard to enter the hold time from 0-999mins.

LAST—"Last" Button

Press it to return to the set page of previous segment.

NEXT—"Next" Button

Press it to forward to the set page of next segment.

- **Start the program operation.**

  Switch the "LIGHT MODE" in the "SET" page to "PROG " mode. The program will start according to the saved program.

- **Pause the program operation**

  To pause the program that is in operation, press the "LIGHT" switch in the home page to "OFF". The timer will be paused. Switch the "LIGHT" to "ON" to resume the current program.

- **Exit the program operation**

  Different from the temperature and speed system, there is no need to set a termination point for the program. So the program will keep running in cycles continuously until it's switched off manually.

  To manually exit the program that is in operation, switch the "LIGHT MODE" in the "SET" page to "FIXED " mode. The program will exit the current program operation, and switch back to Fixed Value control mode.

6.6 Operating the Humidity System

The humidity system features direct steam injection as well as active dehumidification system, which enables extended applications where various humidity level is needed.

The humidity system only operates under Fixed Value control mode. It will automatically switch off when the control mode is switched to Programmable mode.

Under Fixed Value control mode, the relative humidity level can be set via the 6.4 Operating Temperature and Speed System --Fixed Value Mode

The accuracy of relative humidity value is 0.1%RH.

A setpoint of 60-70%RH is sufficient to prevent evaporation. In some ideal conditions,

a maximum of 80%RH can be achieved. The setpoint of humidity must be reduced to avoid further formation of condensation.

The occurrence of condensation is indicating that the maximum humidity is reached, the relative humidity setpoint must be reduced.

The water tank is supplied with the equipment. You can hang it on the side of the unit. Alternatively, you can use your own water tank.

Only use recommended types of water for humidification. Using tap water for humidification, may cause lime scale problem inside the system and the chamber.

6.7 Operating the CO2 System

The CO_2 system features NDIR CO_2 sensor for concentration measurements, and a clear PVC curtain for minimizing the CO_2 gas escaping during door openings. The curtain has Velcro hook and loop fasteners on the upper front edge of the chamber to attach the curtain, and multi slits to facilitate handling of the shaking tray.

The CO_2 system only operates under Fixed Value control mode. It will automatically switch off when the control mode is switched to Programmable mode.

Under Fixed Value control mode, the CO_2 concentration level can be set via the 6.4 Operating Temperature and Speed System --Fixed Value Mode

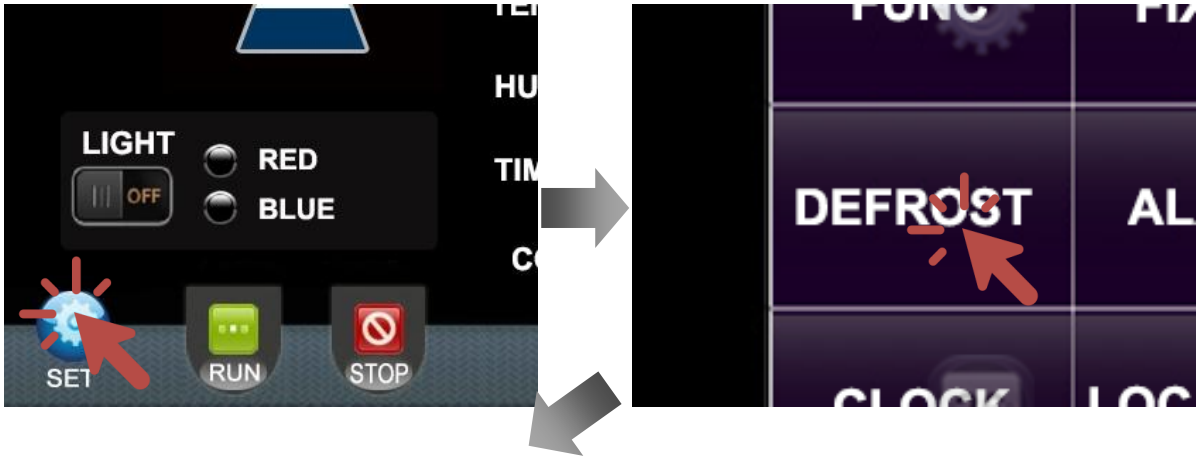
The accuracy of CO2 concentration value is 0.1%RH.

To prevent excessive consumption of CO2 gas, the drain holes, sample port, front door must keep closed.

6.8 Setting Defrosting Cycle

This unit is equipped with automatic defrosting function. When the incubator is set to run at lower temperature set point, proper settings of defrosting cycle will optimize the performance in long term operation.

When the defrosting cycle is running, the circulating fan stops running, and control system activate the defrosting cycle.



To set the automatic defrosting cycle,

- Press "SET" in the home page
- Press "DEFROST" in the "SET" page to start setting the auto defrosting cycle parameters,

DEF.TIMER—Defrosting Frequency

This function indicates the time interval between two defrosting cycles. Use the keyboard to enter the set value between “1-240” hours and press “OK” to confirm and save. Set it as “0” to disable the auto defrosting function. Once the “defrost timer” is set, the unit will automatically perform the defrosting cycle accordingly.

To find out the suitable "defrost timer" setting, the frosting time duration should be counted from start of the low-temperature operation to the point that the actual temperature start bouncing up due to the frosting inside the evaporation chamber. Then set the "defrost timer" as somewhere between 1/10-1/5 of the frosting time duration. For example, if the frosting time duration is 20 hours, the "defrost timer" can be set from 2-4 hours. High relative humidity will require more frequent defrosting cycle.

DEF.PERIOD —Defrosting Time

This function indicates the time duration for each single defrost cycle both under auto and manual operations. Use the keyboard to enter the set value between “1-24” mins and press “OK” to confirm and save. Set it as “0” to disable the defrosting function.

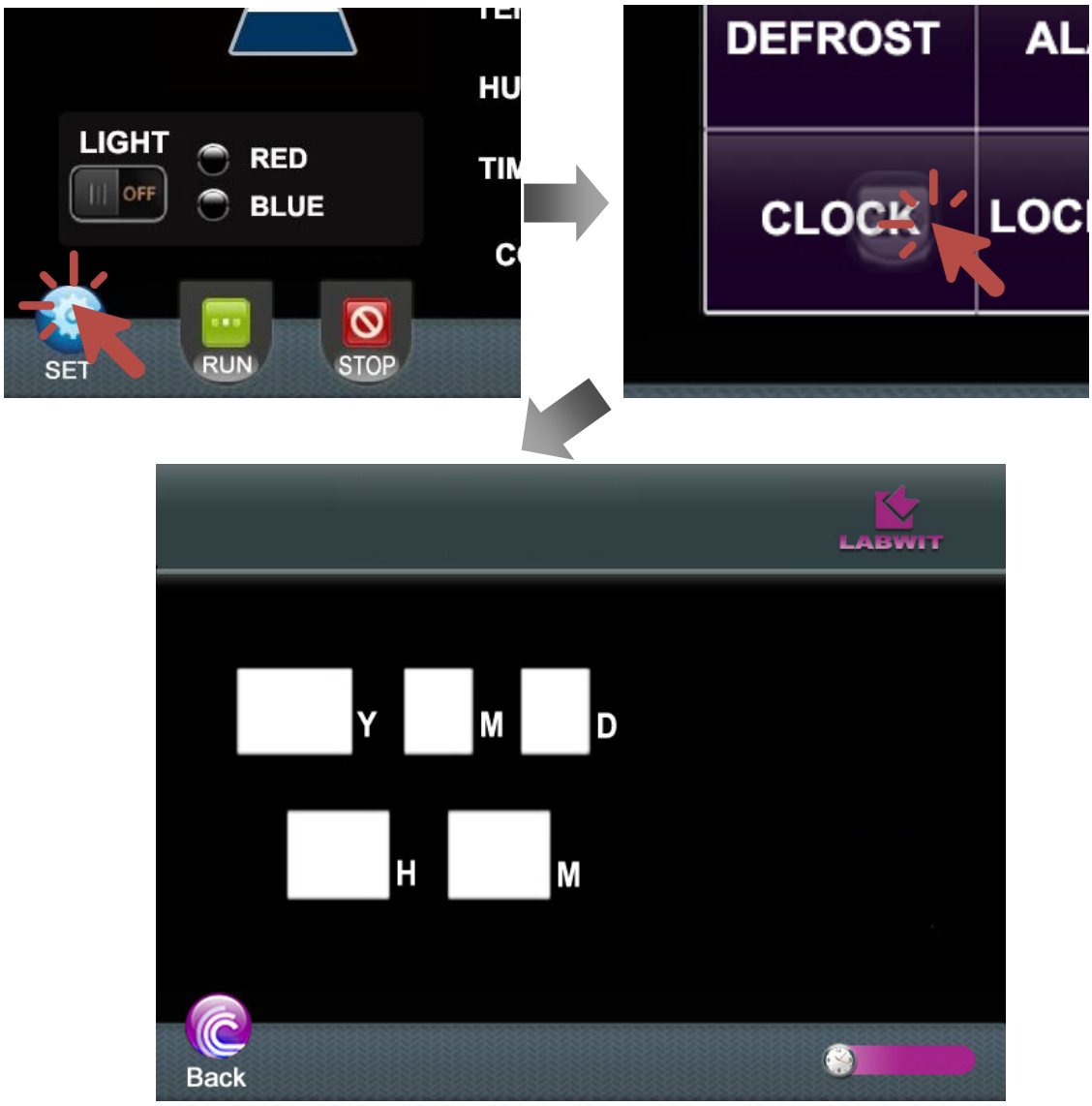
When the ambient temperature is higher than 25℃, like in summer, the recommended setting is 30 seconds, otherwise, 1 min is considered as adequate. As ambient conditions may vary, therefore, always try to find the most appropriate settings

for specified ambient condition.

	**Attention:** It is considered as normal, that the actual temperature slightly deviates during defrosting, and will be stabilized shortly after defrosting cycle finishes.

6.9 Setting Clock Time

There is real clock time display in the right below corner of the homepage. To set the clock time,



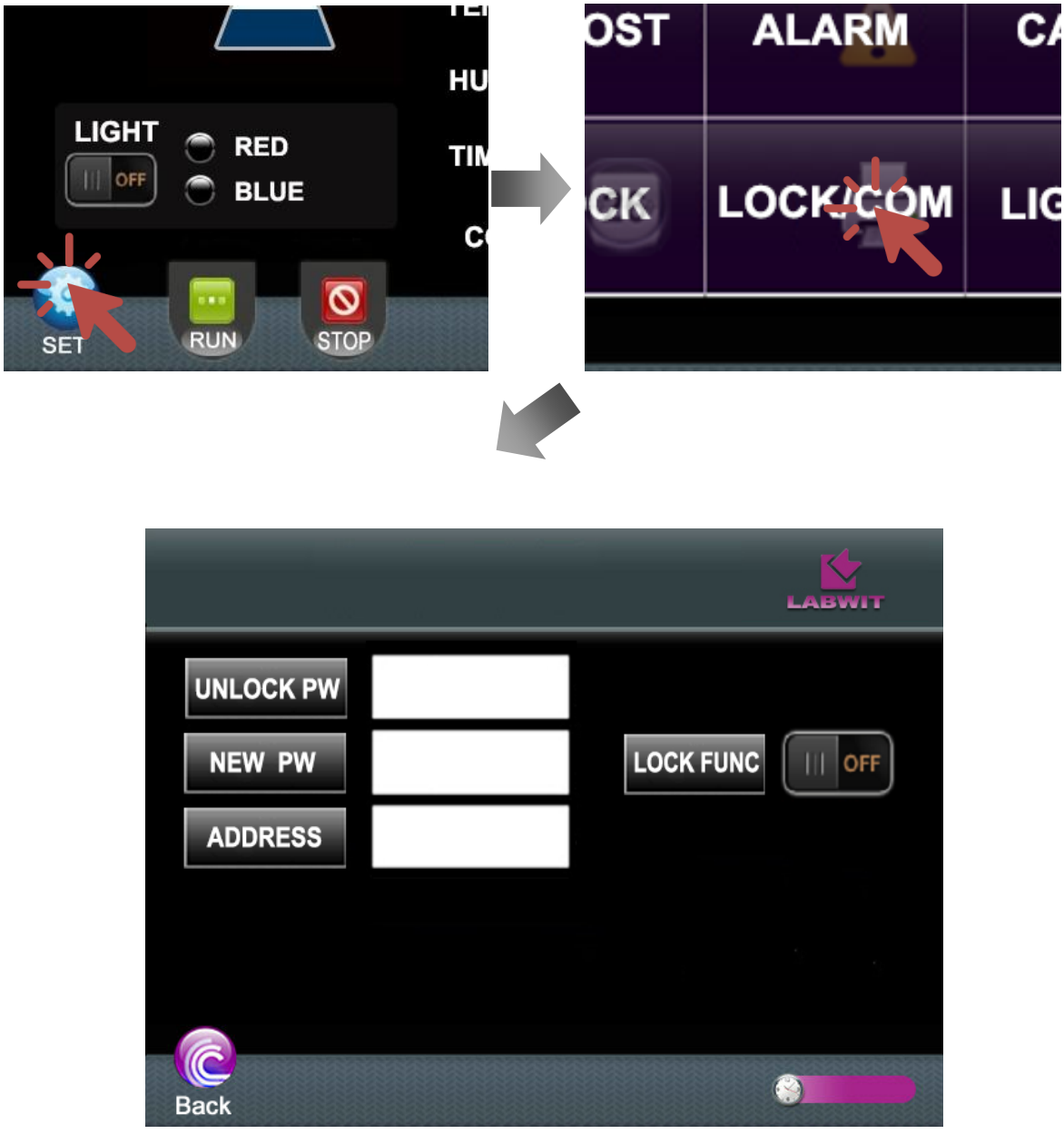
- Press "SET" in the home page
- Press "CLOCK" in the "SET" page to start setting the Year, Month, Day, Hour and Minute.

6.10 Setting Door Password and Communications

6.10.1 Door Locking Password Setting

The incubator is equipped with digital door locking system, protecting the samples from unauthorized access. It is password encrypted and can be enabled/disabled as per user's discretions.

To set this function, including changing the password,



- Press "SET" in the home page
- Press "LOCK/COM" in the "SET" page to set the door locking function and communication address for RS485 connection.

UNLOCK PW—Current Password

Press this button and enter the current unlock password, to activate the settings of this page. Factory Default Password: 8888.

LOCK FUNC —Door Lock Switch

Once the page setting is activated, press this button to switch on/off the door locking system.

NEW PW —New password Setting

Once the page setting is activated, press this button to enter the new door locking password. The password can be set as any number within the range of 1-9999. Press "OK" in the keyboard to confirm and save the new password.

6.10.2 RS485 Communication Address Setting Option

The incubator is equipped with RS485 communication function for data logging. To enable the function, make sure the connections between the incubator and the communication kit is proper and secure. See individual setup manual for detailed instructions.

Moreover, once the connection is done, communication address needs to be set in the "LOCK/COM" page,

ADDRESS—Communication Address Setting

Press this button and enter the address of this unit for RS485 communication. The address can be set as any number within the range of 1-250. Press "Ok" in the keyboard to confirm and save the address.

6.11 Using USB Data Logging System

- The incubator is equipped with USB interface data logging system, which saves all the operational data automatically into mobile drive, for example, USB drive.
- Plug a USB 2.0 mobile drive into the interface on the side of the front door.
- The red LED indicator shall light up during recognition or while the data is being recorded. Do not unplug the USB drive while the red LED indicator is on.
- After the first data record is saved, the system will create a folder (NO"XXX") in the root folder. "XXX" is based on the "Address" set in "LOCK/COM" menu. For example, if the unit address is set as "1" the folder name will be "NO001".
- All data are saved and exported as csv. format in the folder "NOxxx".
- The operating data is recorded once a minute. The system can export a maximum of 6 days of data. Once the maximum limit is reached, the earlier data will be overwrtiten by the new data.

6.12 Using UV Light

The incubator is equipped with a UV light behind the back panel of the inner chamber. The air is sterilized when passing though the back plenum. As it is not exposed to the innber chamber, so it is safe to switch on the during the operation.

To switch on the UV light, press the UV light switch on the side cooling compartment.

6.13 Using Sticky Mat

The Sticky Mat is used for attaching vessels, such as flaks, bottles, dishes etc onto the shaking platforms for all shaking equipments, for example, shakers, rockers as well as shaking incubators. It is as standard 20 x 20 cm in size and can be used to cover the shaking platforms replacing the traditional flask clamps. The Sticky Mat can be easily removed and repositioned by simply peeling off the shaking tray surface. With proper care, the Sticky Mat can be used for several years.

6.13.1 Loading/Unloading the Sticky Mat

ATTENTIONS：

1. The Sticky Mat is only used for undamaged, unscratched cultivation vessels with large, clean, dry and flat bottom.
2. Make sure the Sticky Mat is undamaged, clean, dry and oil free。

Load vessels onto the surface of the Sticky Mat by pressing them firmly into designated place. Tilt each vessel gently to check that they are adhering firmly.

To unload the vessels, tilt the neck of the vessel gently to one side. Wait until the vessel has detached from the Sticky Mat. Large vessels may take about 20-30 seconds to be detached.

ATTENTIONS：

For unloading vessels with large bottom, squirt a few drops of water along the edge of the vessel. Tilt the neck of the vessel gently to one side.

6.13.2 Uninstalling the Sticky Mat

Release the Sticky Mat from one side of the tray and then pull upwards at an angle until it’s completely detached from the shaking platform.

6.13.3 Adhesive Strength

The Sticky Mat will lose the adhesiveness temporarily when in contact with water, but the full strength of adhesiveness will come back once it becomes completely dry.

Clean up any spills as fast as possible. If water spills comes in contact with the Sticky Mat, do not start operation until it's dried completely.

To ensure the full adhesive strength, the recommended temperature range of the Sticky Mat is 18-45°C

Ensure the chamber is free of condensation during humidification. The vessels may become unstuck from the mat, if there is condensation inside the incubation chamber.

6.13.4 Safety

To ensure the safety of use of Sticky Mat, only use flasks and vessels of high quality, for example, Schott Duran® Borosilicate glass, Corning® Polycarbonate vessels. The use of all other materials or quality levels is in the responsibility of the user.

It is recommended that test the Sticky Mat with each type of vessels to be used, under the same condition (Speed, temperature, etc) for a short time period. Do not use it for this application If any movements or dislodgements are detected.

During high speed operations, the Sticky Mat is less secure than the flask clamps. Refer to the below table for the maximum speed to use with a combination of shaking diameter and flasks.

ATTENTIONS:

1. The following speed values are only valid for vessels with 20% filling level.
2. Sticky Mat and vessels have to be totally intact, dry and oil-free.

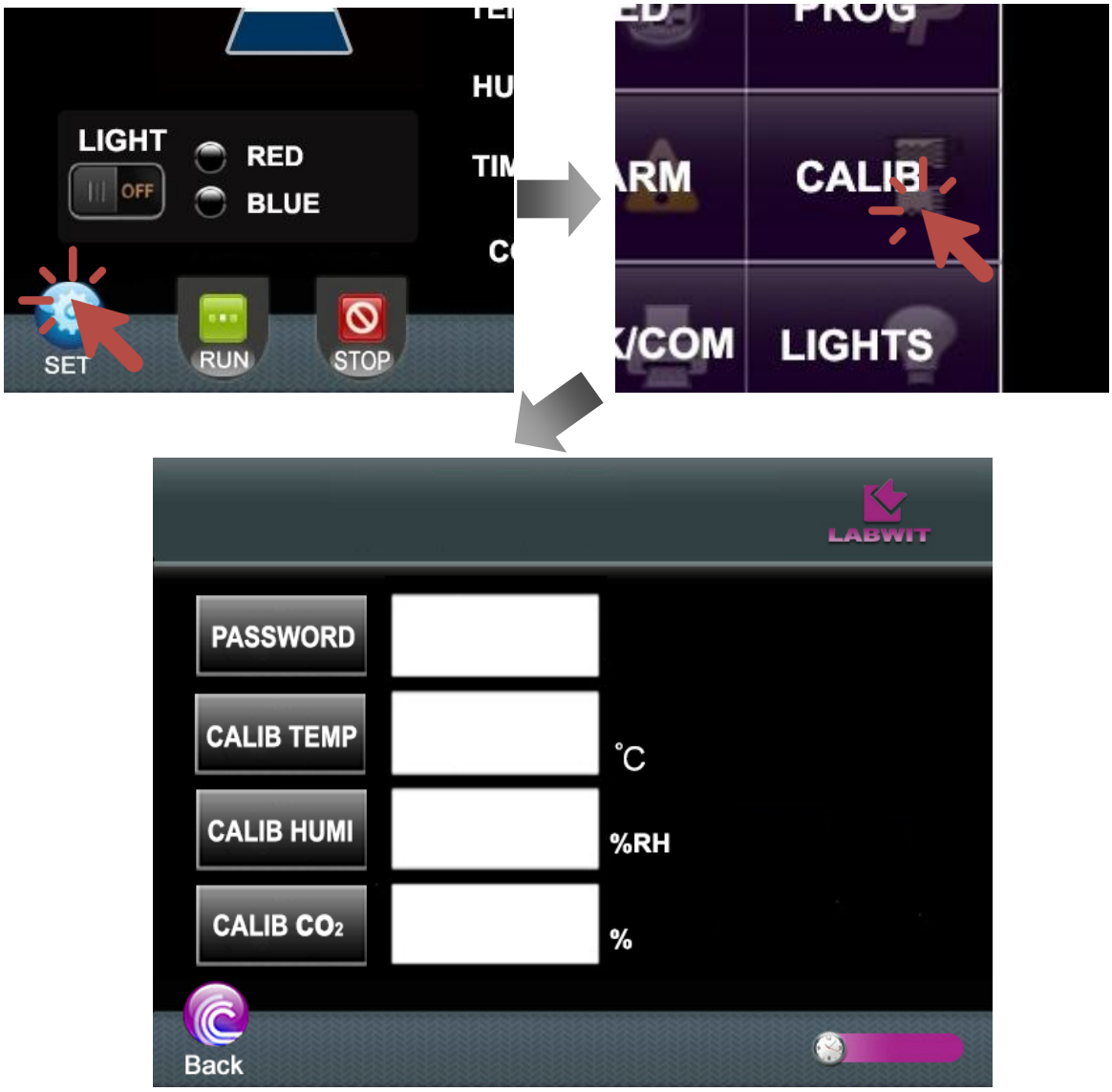
Flask Size	Max Speed @ Shaking Diameter 25-50mm	Max Speed @ Shaking Diameter <25mm
50-750ml	250rpm Max	250rpm Max
1000ml	250rpm Max	300rpm Max
2000ml	250rpm Max	300rpm Max
3000ml	300rpm Max	300rpm Max
5000ml	250rpm Max	300rpm Max

7. CALIBRATING THE UNIT

After the incubator has stabilized at the user selected setpoints, the control systems can be calibrated. When in calibration, the temperature display, humidity display, CO2 display, and can all be adjusted to match a reference standard.

Before any system is calibrated it is critical that the incubator has been allowed to stabilize properly. In the instructions below, each individual system has a recommended stabilization time that is required before calibration.

To calibrate each of the these parameters,



7.1 CALIB TEMP—Calibrating the Temperature Display

- Place the independent temperature reference device in the geometrical center of the chamber.
- If the incubator has just been installed and started up, allow another 30-60mins once the incubator to stabilize at the setpoint before making a calibration adjustment.
- Press "SET" in the home page

- Press "CALIB" in the "SET" page to enter the page of calibrations.
- In the “CALIB” page, press “Password” icon, enter “7724”, and press “OK” to confirm.
- Press the “CALIB TEMP” button, which is showing the current displayed temperature value. Use the keypad to change the temperature value to the calibration value.
- When the desired calibration value is displayed, press the "OK" to confirm and save.

7.2 CALIB HUMI—Calibrating the Relative Humidity Display

- Place the independent humidity reference device in the geometrical center of the chamber.
- If the incubator has just been installed and started up, allow another 30-60mins once the incubator to stabilize at the setpoint before making a calibration adjustment.
- Press "SET" in the home page
- Press "CALIB" in the "SET" page to enter the page of calibrations.
- In the “CALIB” page, press “Password” icon, enter “7724”, and press “OK” to confirm.
- Press the “CALIB HUMI” button, which is showing the current displayed relative humidity value. Use the keypad to change the relative humidity value to the calibration value.
- When the desired calibration value is displayed, press the "OK" to confirm and save.

7.3 CALIB CO2—CO2 Calibrating the CO2 Concentration Display

- Place the independent CO2 gas concentration reference device in the geometrical center of the chamber.
- If the incubator has just been installed and started up, allow 8-12 hours for the incubator to stabilize at the setpoint before making a calibration adjustment. If the unit has been in operation, allow a full hour after the display reaches the CO2 setpoint before making any calibration adjustments.
- Press "SET" in the home page
- Press "CALIB" in the "SET" page to enter the page of calibrations.
- In the “CALIB” page, press “Password” icon, enter “7724”, and press “OK” to confirm.
- Press the “CALIB CO2” button, which is showing the current displayed CO2 concentration value. Use the keypad to change the CO2 concentration value to the calibration value.
- When the desired calibration value is displayed, press the "OK" to confirm and save.

7.4 Restoring Factory Default Settings

To restore the factory default setting,

- Press "SET" in the home page
- Press "CALIB" in the "SET" page to enter the page of calibrations.
- In the “CALIB” page, press “Password” icon, enter “9408”, and press “OK” to confirm.
- All parameter readings will restored to factory default saved value.

ATTENTIONS：

Calibrations must be performed once the system is restored!

8. ALARMS

A sophisticated alarm system monitors all system parameters for any fault condition. At the same time, built in alarm delays protect the user from nuisance alarms created by routine use such as door openings. A list of alarm descriptions, the conditions they look for, and how they are delayed and displayed are in the table below:

Alarm Description	Condition Detected	Delay*	Alarm Rings Back	Other Notes
Temperature Deviation	Temperature reading deviates by ±Deviation value setpoint	4 Minute Delay of Continuous Abnormal Reading	Yes, 5 Mins,	Display shows “Alarm: Temperature! “; Display continues to show Temperature reading
Speed Deviation	Speed reading deviates by ±Deviation value setpoint	4 Minute Delay of Continuous Abnormal Reading	Yes, 5 Mins,	Display shows “Alarm: Speed! “; Display continues to show speed reading
Humidity Deviation	Humidity reading deviates by ±Deviation value setpoint	4 Minute Delay of Continuous Abnormal Reading	Yes, 5 Mins,	Display shows “Alarm: Humidity! “; Display continues to show humidity reading
CO_2 Percentage Deviation	CO_2 reading deviates by ±Deviation value setpoint	4 Minute Delay of Continuous Abnormal Reading	Yes, 5 Mins	Display shows “Alarm: CO_2 !“; Display continues to show CO_2 Percentage reading
Temperature Sensor Failure	Faulty Temp Sensor Detected	No Delay	Yes, immediately	Text Display “Alarm: Temperature Sensor Failure! “; Heating will be disabled
Humidity Sensor Failure	Faulty Humidity Sensor Detected	No Delay	Yes, immediately	Display shows “Alarm: Humidity Sensor Failure!", Humidification system will be disabled
CO_2 Sensor Failure	Faulty CO_2 Sensor Detected	No Delay	Yes, immediately	Display shows “Alarm: CO_2 Sensor Failure! “; CO_2 system will be disabled.
Door Ajar	Front Door Open	1 Minute Delay of Continuous Door Ajar status	Yes, 4mins	Display shows “Alarm: Door Ajar! “, CO_2 injection is disabled, Heating/Cooling is disabled, internal fan shuts down, shaking motion stops.
Low CO_2 gas Supply	Gas supply of the CO_2 source are low	No Delay	No	Display shows “Alarm: Low CO_2 gas supply! ”, continues to show CO2 reading

9. MAINTAINING THE UNIT

Your LABWIT incubator is nicely designed to minimize performance problems. However, regular maintenance is very important for continuous trouble free operation.

Other than regular cleaning, a full set of maintenance checks should be conducted on a regular basis,

Wear personal safety kits, e.g. safety gloves, safety goggles, safety shoes, etc when the maintenance is performed.

Any work of the electrical system must be only carried out by qualified electricians.

Enough spaces must be provided before performing the works.

Follow internal safety regulations.

9.1 Recommended Daily Maintenance Checks

- Check the internal lighting, change the light bulb if necessary.
- Check the Temperature, Speed, Humidity (Option) and CO2 (Option) displays versus set-points.
- Check for and correct any alarm condition.
- Check the lighting panel, report for replacement if necessary (Lighting System Option)
- Check the CO2 gas tank levels, replace the tank if necessary (CO2 System Option)
- Check the water level in the water tank, top up if necessary (Humidity System Option)

9.2 Recommended Annual Maintenance Checks

- Perform a complete calibration of the temperature, speed, humidity and CO2 systems.
- Replace the UV light bulb.
- A full validation is recommended for GMP facilities each time a unit is installed, moved or undergoes significant repair.

9.3 Recommended as Required

- Disinfect all interior surfaces with a general purpose laboratory cleaning agent.
- Clean / replacing Sticky Mats
- Clean the cooling condenser.

9.4 Replacing the Fuse

- Before changing the fuse, main power must be disconnected.
- Two spare fuses are provided with this unit in an accessory pouch.
- The fuse case is located right next to the power plug socket on the back of the unit.
- Unscrew the case cap to remove the faulty fuse.
- Insert the new fuse and screw on the case cap.

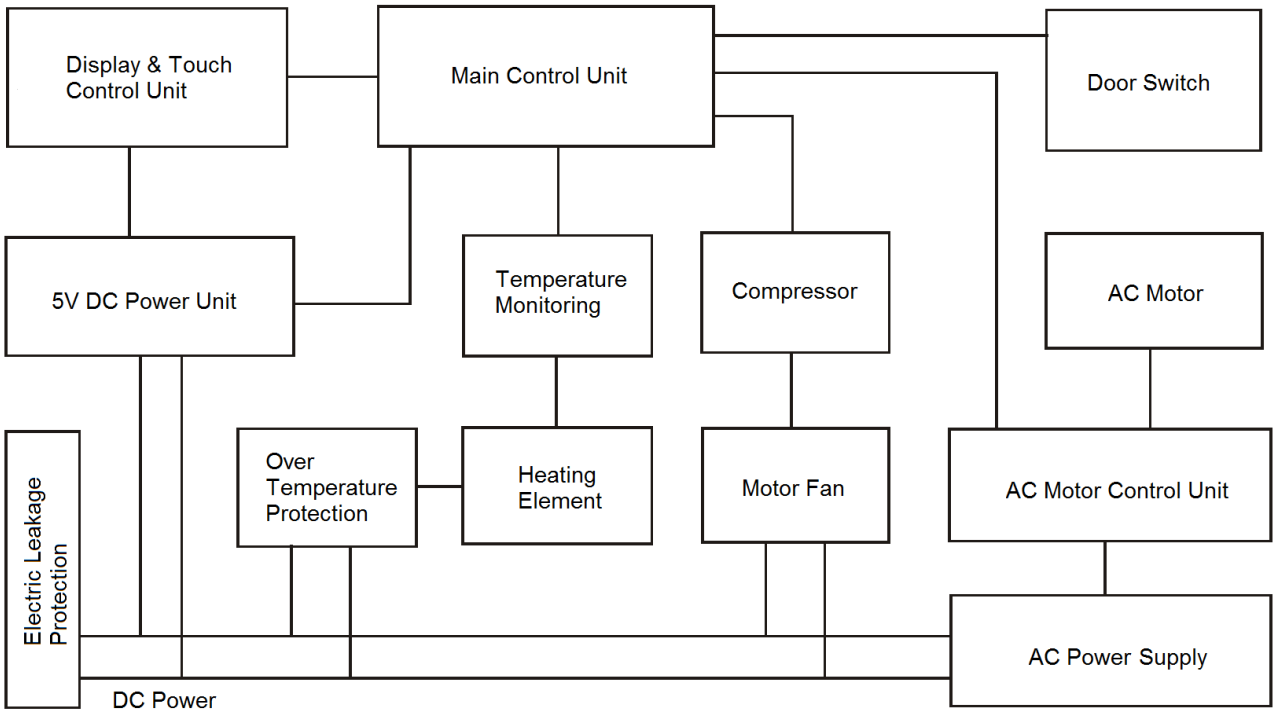
9.5 Cleaning Cooling Condensers

- The surface of the condenser fins of the cooling system must be kept clean and free of dust to ensure optimum heat dissipation
- To clean the fins and copper tubing of the condenser, use vacum cleaner or feather duster for gentle cleaning.

9.6 Cleaning and Replacing the Sticky Mat

- To clean the sticky mat, scrub the surface gently with scouring pad until there is no residual on the mat. Disinfect with quaternary ammonium compounds.
- The adhesive strength of the Sticky Mat can last for several years if the Sticky Mat is properly cared. However, the life span varies upon the frequency of use, maintenance, and the environment where it's used. When if the adhesiveness of the Sticky Mat cannot be restored by cleaning, it must be replaced.
- After extended period of time, it will become difficult to remove the vessels off the Sticky Mat. In this case, do not use excessive force to do so, as this will result in damaging the Sticky Mat. To avoid possible damages, use small amount of water around the bottom of the vessel, once the vessels start dislodging, slowly pull off the mat.
- Avoid exposure to direct sunlight.

10. ELECTRONIC CONTROL SYSTEM



11. TROUBLE SHOOTING.

Error Indicator	Possible cause	Corrections
Power on, No display	Power supply is not connected	Check the power supply system to see if there is voltage on the line
	Plug has no access to socket	Plug in firmly
	The power switch has not been turned on.	Turn on the power switch on the side cooling compartment of the unit
	The fuse is broken	Replace fuse with new one of same specification
	Malfunction of the main power board system	Notify distributor for repair service
Actual temperature is higher than the set point, high temperature alarm is activated	Unit has not yet reached the required (constant) temperature.	Wait a moment and observe
	The circulation fan is broken	Notify the distributor to replace the fan
	Malfunction occurs with refrigeration system	Notify the distributor to repair the refrigeration system
Actual temperature is lower than the set point. low temperature alarm is activated	Unit has not yet reached the required (constant) temperature	Wait a moment and observe
	The circulation of cold air is excessive	Close (part of) the ventilation opening
	The circulating fan is broken	Notify the distributor to replace the fan
	The heater does not work	Notify the distributor to repair the heater
Actual temperature is fluctuating and will not be stable	The door (lid) is not closed firmly	Close the door (lid) firmly
	Malfunction occurs with the control circuit	Notify distributor for repair service
Temperature is constant out of control	Malfunction occurs with the control circuit	Notify distributor for repair service
The shaking movement of platform is unstable	The platform is in imbalance due to a spoiled object	Remove the object , clear and clean the chamber
	The equipment is not placed horizontally	Adjust the left-back foot leveler install the equipment in a proper way.
	Malfunction occurs with control circuit	Notify distributor for repair /service
The shaking platform does not work	The door switch has not yet made contact	Check the door to see if it is closed firmly
	The platform is blocked with an object at the bottom	Remove the platform and clear the object and clean the inside
	The belt is broken	Notify the distributor to replace the belt
	Malfunction occurs with control circuit	Notify distributor for repair service
The shaking movement of platform is out of control	Malfunction occurs with control circuit	Notify distributor for repair service

The platform keeps shaking after the door is opened	The door switch has short circuited	Notify the distributor to replace the door switch
As the door is closed ,the platform starts shaking but the speed runs high suddenly	Improper operating method	Refer to Users Guide and press the Start/Stop button to operate again
Screen is not responsive	Equipment is disturbed by high frequency.	Restart the equipment-if it does not work:
		Notify the distributor.
The equipment causes a strange loud noise	The equipment is not placed horizontally	Adjust the left back foot to make the equipment stable
	The fixed screw of clamp is loose	Remove the platform and tighten the screw
	The platform is loose	Make sure the latches is securely locking the platform in place
	There is strange object, like a piece of a bottle, under the platform	Remove the platform ,clear the object and clean the inside
	Mechanical malfunction occurs	Notify the distributor for repair service
The accumulation of frost is fast after refrigeration is started, resulting in the rise of temperature	The refrigerating time is too long and the evaporating chamber is too humid	Set the temperature to high temperature, e.g. 60°C, and run for 2 hours to dry the chamber. Set auto-defrosting cycles.

12. AFTER-SALE SERVICE

Please review this section before requesting warranty service. At LABWIT, one of our primary goals is to provide customers with high levels of personal service and top quality products, delivered on time, backed by technical service and supported for the life of the product.

Before contacting us for warranty service, please be aware that there are repairs that are not covered under warranty.

WARRANTY DEFINED

LABWIT Scientific Pty Ltd and its authorized local dealers (herein after LABWIT) hereby warrant that equipment manufactured by LABWIT is free from defects in materials and workmanship when the equipment is used under normal operating conditions in accordance with the instructions provided by LABWIT.

COVERED:

Parts and labor for a period of one year from date of shipment.

Any part found defective will be either repaired or replaced at LABWIT's discretion, free of charge, by LABWIT in Shanghai, China, or by its authorized dealers in where LABWIT has its distributors. Parts that are replaced will become the property of LABWIT.

If LABWIT factory service personnel determine that the customer's unit requires further service, dependent of the model involved, LABWIT may, at its sole discretion, provide a service technician to correct the problem, or require the return of the equipment to the factory or authorized service depot.

LABWIT will have the right to inspect the equipment and determine the repairs or replacement parts necessary. The customer will be notified, within a reasonable time after inspection, of any costs incurred that are not covered by this warranty prior to initiation of any such repairs.

NOT COVERED:

Calibration of control parameters.

Improper installation; including electrical service, gas and water supply tubing, gas supplies, room ventilation, unit leveling, facility structural inadequacies or ambient conditions that are out of specification.

Cost of express shipment of equipment or parts.

Any customer modifications of this equipment, or any repairs undertaken without the prior written consent of LABWIT, will render this limited warranty void.

LABWIT is not responsible for consequential, incidental or special damages; whether shipping damage or damages that may occur during transfer to the customer’s point of use. When the equipment is signed for at the customer’s site, ownership is transferred to the customer. Any damage claims against the shipping company become the responsibility of the customer.

Repairs necessary because of the equipment being used under other than normal operating conditions or for other than its intended use.

Repair due to the customer's failure to follow normal maintenance instructions.

Parts considered consumable; including: light bulbs, filters, gases, etc.

Damage from use of improper water quality. Force Majeure or Acts of God.

Damage from chemicals or cleaning agents detrimental to equipment materials.

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