



LWI-EQ ~ Work Instruction on the use of INCUBATOR SHAKER MULTITRON, INFORST

A. Safety Precautions

- The internal & external covers should not be opened or removed with the power switched on.
- When repair and maintenance work has been completed, any safety equipment provided must be refitted in its original.
- The equipment must be installed in accordance with the instructions contained in this user manual.
- The equipment's weight is over the permitted allowance of kilos/pounds that people may lift, so it must be lifted mechanically.
- Users are responsible for ensuring that the equipment is used in accordance with safety procedures applicable to their work and is free of any biological or chemical contamination if an examination by INFORS staff is requested.
- All the housing covers of the basic unit and operating panel are, as they may cover critical areas, only to be removed by personnel explicitly authorized by INFORS to do so.

Safety points relating to installation & use:

- Electrical connections should only be installed and fitted by a qualified electrician.
- Installation of all services lines should be made only with pressure resistant tubing retained with suitable tubing clamps.
- Authorization for use of an oxygen supply and its operation in accordance with your own safety guidelines are the responsibility of the customer.
- The main ON/OFF switch should not be used to end operation.
- Observe all safety issues relating to hazardous chemicals, biological material and equipment under pressure, especially points regarding skin and eye contact.
- The equipment is only to be operated by suitably qualified and trained personnel, both in terms of equipment use & microbiological expertise.
- In normal use, operators should wear appropriate safety clothing, gloves, safety goggles and a face mask as appropriate to the degree of microbiological risk.



B. How to Use Me

Before switching each Parameter on, the set point must be entered:

RPM, °C, Humidity, Illumination & CO₂:

1. “F” key is pressed repeatedly until desired parameter icon is illuminated.
2. The required set point value is entered using “+/-“ keys.

Switching Control On

1. “F” key is pressed repeatedly until desired icon illuminated.
2. Switch parameter on with “ON/OFF” key.

Timer

1. Operation without any timer functions (standard)
2. Single change: the unit runs with chosen parameters for a definite time span, then makes a single change without returning to the original settings.
3. Cyclic operation: the unit alternates all active parameter settings between two states at regular time intervals.

Rules:

- “F” key always sets the current parameter values.
- “F_T” key always sets the relevant parameters for the following (or next) phase.
- The unit always find itself in the phase “F”. The value set by “F_T” are only utilized when next exchange actually take place.

Loading Tray

1. High vessel = High centre of gravity
2. Low vessel = Lower centre of gravity
3. The higher the distance the more the unit can vibrate.
4. Load tray evenly so the weight of flasks is spread over the whole tray.
5. Flasks with extraordinary height should not be shaken at high speed.
6. The allowed loading should not exceed the followings:
 - a. For Ø25mm:

Until 350rpm	9-19 kg (including weight of tray)
>350rpm	12-16 kg (including weight of tray)
 - b. For Ø50mm:

Until 250rpm	9-19 kg (including weight of tray)
>250rpm	12-16 kg (including weight of tray)

Shaking speed

MULTITRON	Ø25mm	Ø50mm
Lower Unit	400 rpm	350 rpm
Middle Unit	400 rpm	300 rpm
Upper Unit	350 rpm	250 rpm



Handling shaker without removing tray

1. The shaker is stopped temporarily.
2. The motor is waited to stop (unlocking audible; metallic sound).
3. The shaking goods are manipulated.
4. The shaker started automatically to operate again.

Removing Tray

1. The shaker is stopped temporarily.
2. The motor is waited to stop (unlocking audible; metallic sound).
3. Door is opened up to 90°.
4. Tray with handle is pulled out off the incubation chamber over the retainer & along guide rails using the handle(s).

**Moving shaker table can cause injuries. Tray should handle in state of rest.*

Inserting Tray

1. The tray is put between the two lateral guide rails.
2. The tray is pushed on the holds backwards into the incubation chamber up to retainer.
3. If tray cannot be pushed, the tray is removed and checked for distortion & curves.
4. If shape of tray is normal, foreign bodies in the incubation chamber is searched & should be removed.
5. Door is closed.
6. The shaker restarts automatically.

**Do not start shaker if tray is not inserted correctly!*

C. Preventive Maintenance

1. Always use protective goggles & gloves while handling glassware.
2. Always use container with wide & flat base only.
3. Clean the sticky stuff to ensure maximum adhesive power.
4. Always ensure the bottom container is dry & clean. Never use damaged flask.
5. Flask is removed by pushing or pulling neck gently & evenly. Wait a few second. Large containers take up to 30s until flask is released.
6. Flasks which firmly attached can be released using water.
7. Adhesive power will diminish gradually due to dust & dirt sticking on the surface. To generate, clean regularly with water & mild detergent.
8. Green adhesive matting is applied to universal trays.
9. After approximate 10,000hrs of operation, it is recommended to overhaul the shaker.
10. The machine can be cleaned with damp cloth & neutral mild detergent.
11. The 2 cones & 2 corresponding hoes in tray should be lubricated with thin lubricating film.
12. To open tray table, the 4 wrenches crosswise fitted in the centre of table is removed.
13. The table at the front side can be lifted up to max. 30°. Lifting higher causes damage to silent support blocks behind tray.

**Unplug main supply prior to cleaning the unit!*



D. Calibration

Contact supplier/distributor/INFORS rep.

E. Troubleshooting

Error/Display	Signifies	Reasons	Solution
Er1 DEC RPM Led	Machine does not start	Drive/table blocked. Driving belt torn. Motor fuse defective. Motor not connected to print or motor defective.	Restart machine.
Er2 DEC RPM Led	Machine does not start	Drive/table blocked. Driving belt torn. Motor fuse defective. Motor not connected to print or motor defective.	Restart machine.
Err CTL RPM Led	Machine accelerate too fast	Motor control defective. Interference with speed measurement.	Restart machine
Er1 Thl °C Led	Temperature too high (>65°C)	Defect in the measurement electronics of internal temperature measurement.	Contact service
Er1 Tho °C Led	Temperature too slow (<0°C)	Defect in the measurement electronics of internal temperature measurement.	Contact service
Er1 SEn °C Led		Defective PT100 or connecting cable is broken	Contact service
Er2 Thl °C Led	Temperature in the flask with external PT100 is too high (>70°C)	Defect in measurement electronics of external temperature.	Contact service
Er2 Tho °C Led	Temperature in the flask with external PT100 is too low (<0°C)	Loose connection or disconnected cable in the external temperature measurement system. Defect in measurement electronics of external temperature.	Contact service
Er2 SEn °C Led		Defective external PT100 or the electronics	Contact service



Err H ₂ O & humidity diode		Not enough water in the reservoir	Add on water
P.Fail	Power failure Not an error but alarm failure	One of the parameter in still On while the machine have been switched off.	Turn off every parameter before switch off the machine.
The large display stays dark		Operation light still burns Main switch turned off Power cable unplugged Electric fuse defected	Contact service Turn on main switch Plugged in power cable Replace with new fuse
The heating does not work		Heating control deactivated Set point not adjusted correctly Capillary thermostat set to 10°C higher than set point.	Turn on the heating control Adjust set point correctly Adjust capillary thermostat to lower temperature than set point
The shaker drive does not work		Motor control deactivated Set point not adjusted correctly	Turn on motor control Motor control is activated Set point is correctly adjusted
The incubation illumination does not work		Light control is deactivated Set point not correctly adjusted Both heater fan does not working	Turn on light control Set point is correctly adjusted Contact service
The parameter values cannot be reached			The control of relevant function (temp.,speed or light) is checked.
Operating mode/timer function cannot be programmed			Complex programming steps should not be made in over-hasy way.
The unlocking mechanism of the door does not work			Contact service
Function control of the door tilt-switch			Turn on all controls Check whether different functions start to operate



F. My Specification

Width	: 1075 mm
Depth	: 865 mm
Depth with opened door	: 1160 mm
Height	: 540 mm (with rubber foot)
Incubation chamber (h x b x d)	: 390 x 925 x 550 mm
Incubation chamber (volume)	: approx. 200 l
Required charging space (b x d)	: 1235 x 965 mm
Weight without tray	: 89 kg
Electric connection	: 115/230 or 3 x 230 volt
Current consumption	: Multitron: 5A
Multitron with cooling ZM 110	: 8A
Multitron with illumination ZL 112	: 7.5A
Multitron with illumination ZL 110	: 10.5A
Power: approx. 1200 watt (incl. illumination and heating, excl. cooling)	
Rotation speed	: see chapter 8.2. (20...400 RPM)
Max. deviation	: 1 % with maximum speed of rotation
Temperature control	: electronic PID-controller with Pt-100 probe
Temperature precision (Pt-100)	: +- 0.2 °C
Temperature range ¹⁾ (without light)	: 4 °C over ambient temperature to 65 °C
With ext. cooling ¹⁾	: depending on the temperature of the coolant and the environment
With int. cooling ¹⁾	: approx. 15 °C below ambient temperature (but not under 4°C) up to 65 °C
Air circulation (total)	: 360 m ³ /h
Heating power	: 700 watt
Cooling power	: 700 watt
Permitted humidity (available)	: 85 % r.H. (not adjustable, on demand a higher range is available)
Tray	: tray size M (850 x 470 mm)
Flask	: according to the specifications of the customer
Weight of tray	: average value approx. 7.5 kg (depending on the size of the clamps and the quantity)
Allowed loading (incl. tray)	: with 50 mm diameter up to 250 rpm approx. 9 - 19kg above 250 rpm approx. 12 - 16 kg with 25 mm diameter up to 350 rpm approx. 9 - 19 kg above 350 rpm approx. 12 - 16 kg
Order number	: varies according to the type
Illumination request	: a lot of different spectral options are available upon request

* For ambient temperature up to max. 30 °C