

Compact Digital Mini Rotator

Orbital Motion, 100-240V AC, 50/60Hz

Operation Manual 9240-11-018



Important Before using this product, read this entire operation manual carefully. Users should follow all of the operational guidelines contained in this manual and take all necessary safety precautions while using this product. Failure to follow these guidelines could result in potentially irreparable bodily harm and/or property damage. ▲

Caution All internal adjustments and maintenance must be performed by qualified service personnel. ▲

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MANUAL NUMBER 9240-11-018

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This manual contains important safety and operation information. You must carefully read, understand, and follow all the instructions in this manual prior to operating this instrument. Keep this manual in a safe place nearby for reference and make it easily available to all users.

- 1) This manual highlights DANGER/WARNING/CAUTION/NOTICE alerts to prevent injury or property damage and also to achieve optimum performance of your instrument.
- (2) These alerts are classified into four types in this manual depending on the importance and the risk levels as described below:

Symbols	Meaning
	Indicates a hazardous situation which, if not avoided, will result in death or serious injury.
	Ignoring this warning could cause serious injury or even death.
	Ignoring this caution could cause injury or property damage.
	Ignoring this notice could cause operational problems.

- 3) The claim which is out of the quality guarantee published by the Manufacturer is out of Manufacturer's responsibility.
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Section 1 Warnings and Cautions

WARNING

Ignoring the following warnings could cause serious injuries or even fatal accidents.

Check and connect properly -the voltage, phase and capacity of power supply on the ID plate before installation.

Power supply must be properly grounded. Abnormal grounded connection causes serious damage. Grounded connection must not be on the water pipe and gas pipe.

Use correct and provided power cord. Power cord: Wall outlet with grounded terminal power cord 250V 7A.

Do not install the product in the place that the gas could leak out. Do not use in a place that has industrial oil smoke and metallic dust. It causes fire or electric shock.

Do not use the machine near places where explosion can occur due to organic evaporating gases.

Explosive materials: Acid, Esther, Nitro compound

Inflammable materials: salt peroxides, inorganic peroxide, salt acids.

Check equipment for permissible environmental conditions when used inside Temp. & Humid. Chamber or Incubator. It can be cause of fire or trouble by shaker electricity, electronic, and damage of motor.

Shaker Permissible environmental condition; Temperature 2°C to 60°C, Maximum relative humidity 80%.

Wear your personal protective equipment in accordance with the hazard category of the medium to be processed. Splashing liquids, projectile parts, body parts, hair, clothing and jewelery getting caught.

Unplug, if there is strange sound, smell and smoke from the product. Stop operating and request service.

Keep out of the direct sunlight. It may influence that product life and operation properly.

Do not use the machine at places where moisture is high and flooding can be happened.

Do not assemble, repair, modify on your own. The product may not work well and electric shock change the efficiency of the product. Also this will void the warranty.

Section 1

Warnings and Cautions

CAUTION

Indicates a hazardous situation which, if not avoided, may result in minor or moderate injury.

Do not put heavy things on the power line. Do not put the machine on the line. It may take off the wire coating and cause electric shock or fire.

Do not touch it with wet hands and connect the main plug correctly. It may cause the electric shock or injuries.

Install power outlet near instrument for convenience.

Do not install the rotator near machinery generating high frequency noise. Avoid installing near high frequency- welding machine, sewing machine, and mass SCR controller.

Do not inject any liquid and inflammable things inside of product.

Do not pour water or put liquid on the top of the product when cleaning.

Intercept the main power immediately and request the service when water may be in the product.

Do not let the product take any strong shock or vibration. It causes abnormal operation or trouble. It may deteriorate the ability of the product and not obtain correct results.

Do not sprinkle insecticide or flammable spray on the product. Use smooth cloths. Cleaning with solvent can cause fire and deformity.

Power off while product cleaning. It may cause the electric shock or fire.

Disconnect the power plug if some sounds and burning smell, smokes occur. And request service.

Do not let the product take shock by falling down. It will cause wrong operation and malfunction.

Section 2 Functional Descriptions

Compact Digital Mini Rotator is commonly used for mixtures, homogenizing and various hybridization, immunocytochemistry reaction or gel staining / destaining process and over biotechnology.

Features

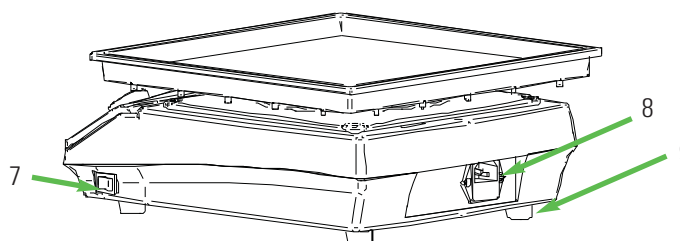
This product is designed to be user safe in laboratories, convenient and follow features.

- (1) User can choose easily the instruments rotating speed (50~300 rpm) for their own purposes.
- (2) The controller display adopts VFD (Vacuum Fluorescent Display). It is easy to indicate stirrer set up and operating condition.
- (3) It is convenient to use in an incubator or a low temp. room because It is small and easy to move
- (4) User can do conveniently timer setting. (1 min to 99 hour 59 min)
- (5) The tray has the efficient size to be placed 6 Well-pate and can be separated from main body to keep using in clean condition. (Tray: optional)
- (6) It is conveniently used for Microbiological culture by Universal Platform and flask clamp(optional)
- (7) Rubber Mat and Dimpled Mat are optional
- (8) Universal Platform is optional. Flask clamp, micro plate can be equipped on Universal Platform.

Construction



- (1) Non-slip pad (Silicone pad or Sticky pad): to protect sliding of glass flask (optional)
- (2) Tray: to be placed sample or carried (optional)
- (3) Rubber bands: to fix and tie the sample (optional)
- (4) VFD panel & Controller: The panel indicates product setting and control condition.
- (5) Touch Button: to choose RPM or TIMER individually, operating by orange and green LED lamp
- (6) Knob: to set a shaking speed / timer and start / stop.



- (7) Power switch: It is the main ON/OFF switch and supplying power of the product.
- (8) Socket: Connect the power cable on the socket.
- (9) Foot: to prevent from slipping and support main body

Section 3 Installation

Check to see if there is any damage in the instrument packaging before unpacking. Then unpack the instrument carefully. Inspect to see that the instrument was not damaged during transportation.

Checking Instrument Components

Check the instrument components supplied in the package after unpacking. If a noticeable issue or an omission is found, immediately notify your local Thermo Scientific dealer's Service Department.

BASIC COMPONENT	QUANTITY/ RECEIVED	DESCRIPTION
Operating Manual	1/OK	-
Main Unit	1/OK	-
Power cord	1/OK	-

Installation Environment

The unit should be installed in a suitable environment as described below.

- Temperature: 2°C ~ 60°C
- Relative Humidity: RH 10% ~ 80%
- Maximum Altitude: Up to 2000m

WARNING

- The unit should be located away from naked flame sources, direct sunlight. It can cause a malfunction or lower the function.

Place the unit onto the table as far as possible when in use and keep suitable distance from other instruments.

CAUTION

- Do not place the unit near other laboratory equipment which can be readily influenced, even by weak motor vibration.

Fixing Feet and Keeping Balance

STEP 1: Gently press the feet on the table.

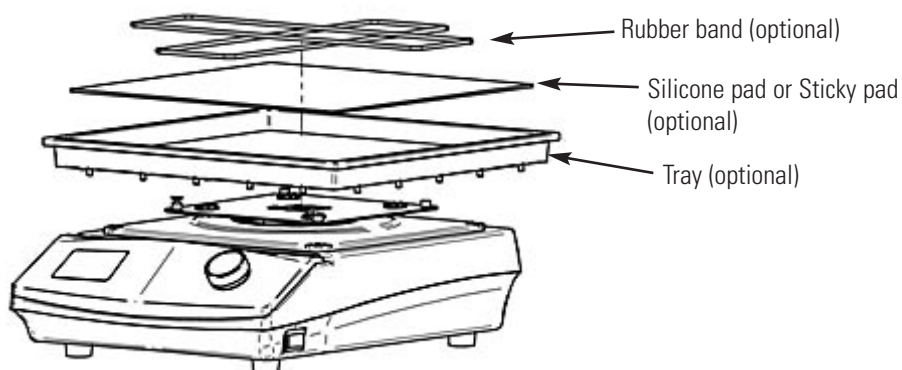
STEP 2: Check to see if shaker is level.

Tray Installation (optional)

Install the provided tray with main body as follows. It can be used by installing the optional non-slip pad as necessary.

STEP 1: Put the protrusions of tray into the 4 holes of main body

STEP 2: Please check if the tray is fitted perfectly



⚠ WARNING

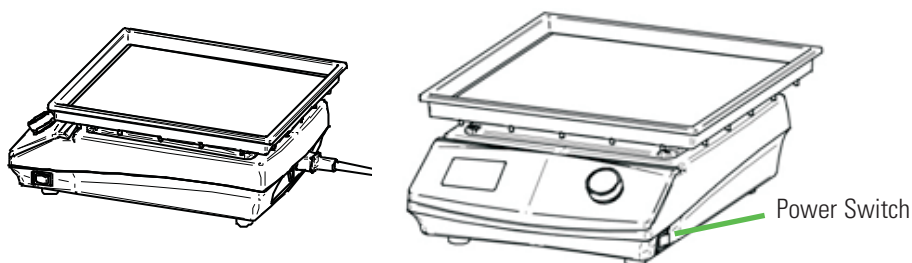
- When the product is operating, if you give wrong force to the product or catch tray, the shaft can be damaged.

Connecting to the Mains Power Supply

Connect the electric power to the unit according to the following process.

STEP 1: Switch off the main switch before connecting AC power cable.

STEP 2: Connect the power cable to the socket located on the unit back.



⚠ WARNING

- Use the power cord only supplied with the unit.

Section 4 Operation



(1) VFD (Vacuum Fluorescent Display):

Check status of unit through VFD display.

rpm: Indicator below PV and SV shows RPM.

Time: Run time or Indicating Timer mode.

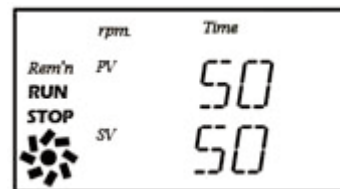
PV: Current RPM


SV: Setting RPM


Run: It indicates the unit works.

Stop: It indicates the unit stops.

Rem'n: It shows remaining time during Timer mode operation



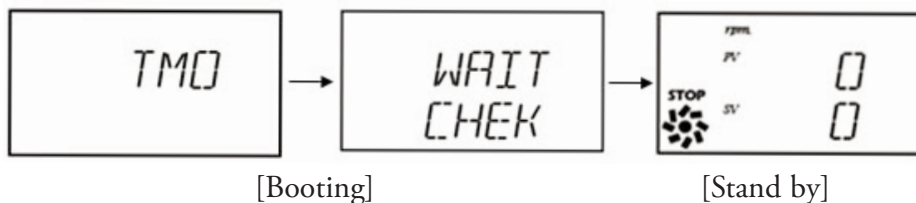
 (2) RPM button: It indicates that the unit works. RPM can be verified during Timer mode operation.

 3) TIME button : Timer and Run time can be verified.

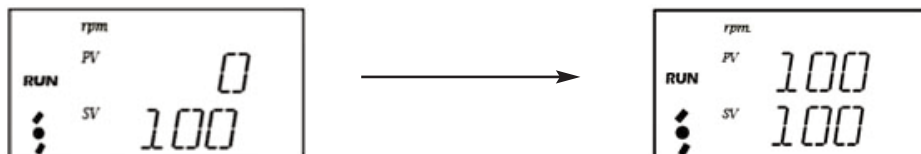
(4) Dial knob : RPM setting, Input time, or stop the unit


Start and Stop

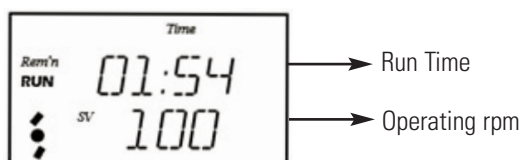
(1) Turn on the switch at the bottom right of the unit.



(2) Dial the knob and set the desired RPM.



(3) Run time can be verified during shaking if you press  button.



Display returns to previous display about after 10 seconds.

(4) You can stop the unit if you rotate or press the dial knob.

How to Set the Timer

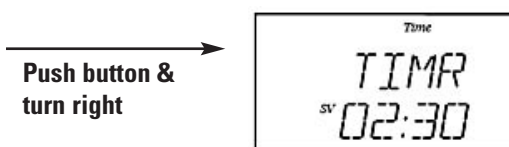
(1) Press Timer button when the unit stops.



(2) Time input display shows when you press the dial knob.



Input Hour/Min: Hour blinks during setting



How to Set the Timer (continued)

STEP 1: Input hour by rotating dial knob to right or left direction.

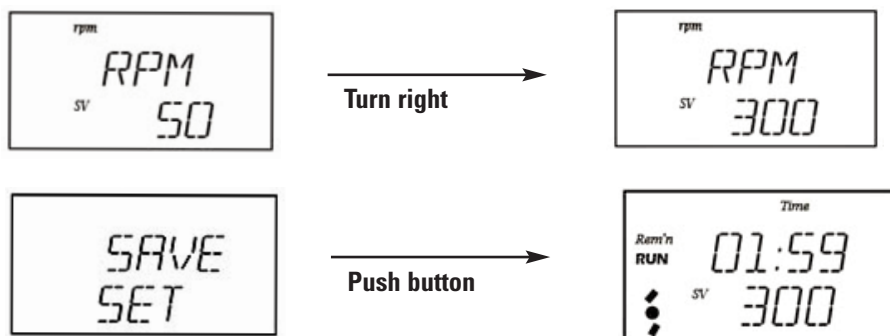
STEP 2: Press dial knob 1 time.

STEP 3: Input minute by rotating dial knob to right or left direction.

STEP 4: Press dial knob 1 time. Display moves to next mode (RPM setting)

How to Set RPM

Input RPM by dialing the knob. Press dial knob 1 time to save set value and unit starts shaking. Remaining time and set value (RPM) show on display.



(1) Shaking stops and alarms when the time is terminated. If you press dial knob or touch button, display returns to stand by status.



Stop Timer

Timer function can be stopped as follows;

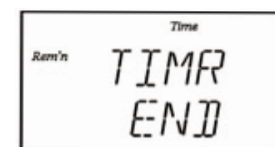
STEP 1: Press the dial knob.



STEP 2: Turn the dial knob to right to choose STOP/YES.



STEP 3: Press the dial knob.



Stop Timer (continued)

NOTICE

- RPM Setting is available from 50 rpm min.
- If you press the Timer button at any stage of setting timer, it returns to stand-by mode. You can set time and rpm again by pressing Timer button.

⚠ CAUTION

- Using the stop button does not work while timer is operating. Refer to information above.

Section 5 Maintenance

Classification	Inspection cycle	
	Daily	Weekly
General		
Power cord		
- The conditions of connection for power supply and an adaptor	•	
- The presence of power supply and an adaptor contact wetting, and cable peeling off, and out of contact	•	
Surface cleaning		•
Main Body		
Controller display status	•	
Controller function checking		•
Motor on/off status	•	
Check attachment connections for being tight	•	

Cleaning of Tray and Unit Body

Remove a contaminant by cleaning the unit frequently with a soft cloth before and after using, otherwise it cannot be readily wiped out for a long time. Keep the unit clean always without any contaminant.

WARNING

- Do not soak the product in the water to clean.

Keeping Product

- (1) Unplug the instrument from the main power.
- (2) Clean the instrument with a soft cloth neatly.
- (3) Store in a dry place after packing.

Section 6 Troubleshooting

Electrical Trouble	Causes	Solution
The unit does not turn on	Incorrect electric power	Compare power source and voltage on the ID plate and make sure they are the same. ID plate is found on the back of unit.
	Power failure or circuit breaker shuts down	Find out the causes of power failure and recovery.
	Main plug not seated properly.	Check the electrical cord connection at the unit to ensure it is fully seated.
	Check the electrical cord connection at the unit to ensure it is fully seated.	If the socket / plug / main power line are cut, request service.
	PCB has damaged by reagent	Request service.
Room circuit breaker trips often when the unit is turned on or running	Too many plugs connect at the same time	1. Check the circuit breaker size along with the voltage and current supplied to it. 2. Check that several similar units are inserted together, if so, you should not use overly.
No VFD	Main plug is not inserted correctly	Check electrical cord connection at the unit to ensure it is fully seated.
	Power failure	Find out the causes of power failure and recovery.
Button doesn't work well	Button switch has damage	Request service.
	Power failure	Find out the causes of power failure and recovery.

Troubles During Operation	Cause	Action
Incurring while running the device if it sounds	Axis deviation in the interior of the unit	Request service.
Touch button doesn't work well	Capacitance sensor initialization errors	Off the power switch on the power supply is blocked. In a few moments to initialize the controller power supply.
Spinning speed cannot be controllable properly.	DC Motor and circuit problem.	Request service.
In case the severity of changes in rotational speed	Heavy leaning to one side of sample tray is located	Reduce load or tray in the center

Error Messages on Display	Cause	Action
OVER LOAD	Overloaded by the amount of work overload on the motor	Use in a fixed range of uses.
	Foreign substances jammed in the rotating part	Take off the tray and remove foreign substances.
	Motor driver board problem	Request service
	Average life of motor ends	Request service
WARN KEY	In the key of the button pressed	Request service in case symptoms remain
MOTR CHEK	Motor driver board problem (communication part)	Request service

Section 7 Accessories

Designation	Order No.	Description
Universal platform	88880106	-
Rubber Mat	88880101	-
Universal attachment	88880104	-
Dimpled Mat	88880102	-
Rubber Bands	88880105	-
Clamp 50ml	88880107	
Clamp 100ml	88880108	
Clamp 250ml	88880109	
Clamp 300ml	88880110	
Clamp 500ml	88880111	
Clamp 1L	88880112	
Clamp 2L	88880113	

Universal Platform

An universal platform with screw holes is provided as an option to simply attach various accessories. Using an universal platform with its fixable flasks or well-plates guarantees safer stirring operations at high rpm.

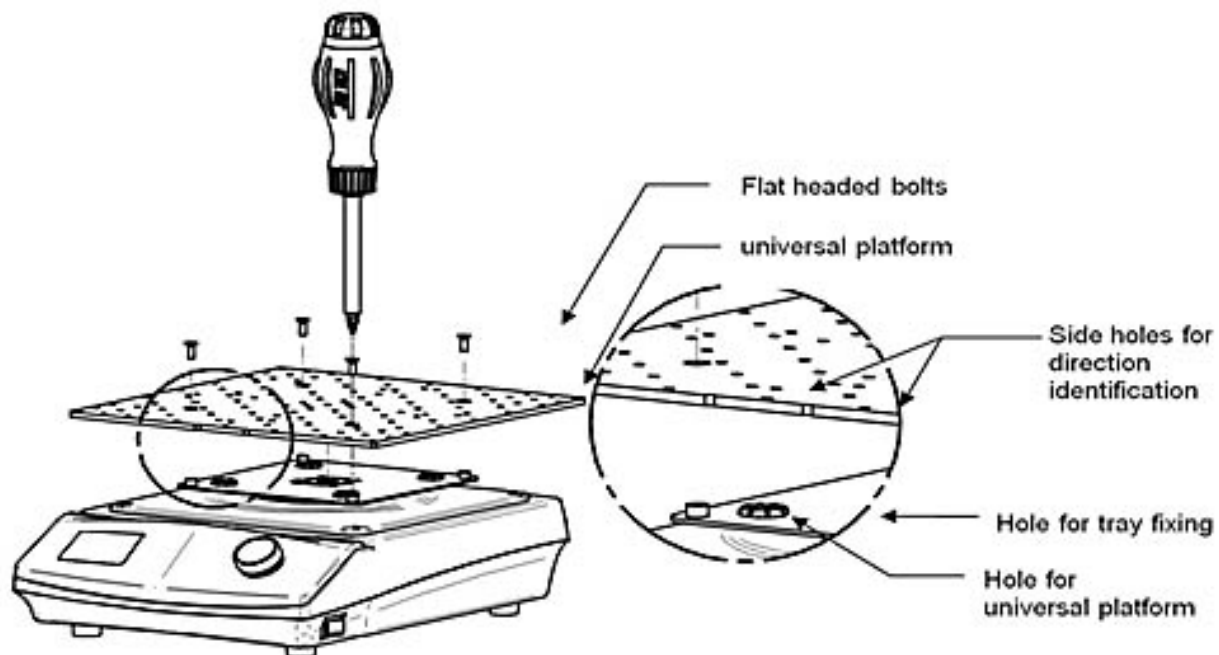
Universal Platform Installation

STEP 1: Remove the installed tray by lifting up.

STEP 2: Check identification holes at two sides of overall platform.

STEP 3: Place the platform on the top by adjusting platform's four screw holes to fit in the top's screw holes.

STEP 4: Fix platform to main body with four flat head bolts as shown in figure below.



Section 8 Technical Specifications

Model		Compact Digital Mini Rotator
Technical Data	Speed range (rpm)	50 ~ 300
	Timer	1min to 99 hr 59 min
	Orbital diameter (mm/inch)	13 / 0.51
	Load max. (kg / lbs)	up to 4 / 8.81
	Ambient temperature range (°C)	2 to 60
	Accuracy at 100 (rpm)	± 5
General Data	Speed control	Feedback Control PID
	Control panel	VFD (Vacuum Fluorescent Display), Touch key, Dial Button
	Safety device	Over Current detection
	Motor	BLDC
	Material	PP, PET, Powder coated steel
	Electrical supply	100-240 V, AC 50/60 Hz
	Tray dimension (W x D, mm/in)	276 x 276 / 10.87 x 10.87
	Overall dimension (W x D x H, mm/in)	276 x 334 x 130 / 10.9 x 13.1 x 5.1
	Net weight (kg / lbs)	8 / 17.6

** If not specially mentioned, the standard value is from statues of 25°C, 60%R.H.*

** Specifications can be changed without prior notice for quality upgrade*

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The Warranty Period starts two weeks from the date your equipment is shipped from our facility. This allows for shipping time so the warranty will go into effect at approximately the same time your equipment is delivered. The warranty protection extends to any subsequent owner during the first year warranty period.

During the first two (2) years, component parts proven to be non-conforming in materials or workmanship will be repaired or replaced at Thermo's expense, labor included. Installation and calibration are not covered by this warranty agreement. The Technical Services Department must be contacted for warranty determination and direction prior to performance of any repairs. Expendable items, glass, filters and gaskets are excluded from this warranty.

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