

## *FlexChem* Model 404 Rotating Oven USER MANUAL

Cat. #1052-20-1, 1052-20-2, 1052-22-1 & 1052-22-2



**FOR RESEARCH USE ONLY**  
**Not for Use in Diagnostic Procedures**

## Serial Number

The following serial number identifies the specific instrument you have purchased and must be referenced when requesting service. A copy is affixed to the instrument.

Technical Service: (408) 733-7337, [techserv@scigene.com](mailto:techserv@scigene.com)

## Warranty

SciGene warrants that the rotating oven described in this manual shall be free of defects in materials and workmanship for a period of 12 months from date of delivery. This warranty does not cover removable rotators or accessories including hybridization tubes. In the event of a defect during the warranty period, SciGene's limit of liability will be to provide replacement parts at no charge or, at its sole discretion, replace the product. The foregoing warranty is void in the event the unit was abused or modified or used in a manner inconsistent with its intended purpose. SciGene makes no other warranty, expressed or implied including warranties of merchantability and fitness for a particular purpose. In no event shall SciGene be liable for any direct, indirect, special, incidental or consequential damages or for any damages resulting from loss arising out of or in connection with the sale, use or performance of the product.

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## I. SAFETY NOTICES

### A. Warnings

Failure to comply with the following warnings that are affixed to the product can lead to possible personal injury or death.



### B. Cautions

Failure to comply with the following cautionary statement affixed to the product may lead to possible personal injury. Items heated in the oven should be handled with heat protective gloves.



Open all closed vessels heated in the oven with the opening pointed away from you to avoid contact with heated aerosols.

### C. Lifting and Moving the Unit

The rotating oven you have purchased weighs approximately 70 lbs (32 kg). Use caution when lifting the unit to protect you and others from personal injury.

## II. UNPACKING AND SETTING UP YOUR OVEN

### A. Removing the Unit from the Carton

Position the shipping carton on the floor close to the intended location.

Open the shipping carton and remove the foam inserts from the top of the unit. One person should be positioned at the front and one person at the back of the oven. Grip the recessed edges along the top of the unit and lift it straight up and out of the shipping carton, taking care to keep it balanced, and place it on the bench.

Carefully inspect the unit for damage. If there is evidence of damage, do not discard the shipping materials since they may be needed to return the unit.

### B. Items Provided

The items that comprise the *FlexChem* Model 404 Rotating Oven are shipped in either two or three boxes depending upon which rotator is purchased with the unit.

The system is shipped in two (2) boxes when equipped with the *FlexChem* Block Rotator.

- Large Box (23"x23"x26") contains:
  - Rotating Oven
  - User Manual
- Small Box (20"x15"x15") contains:
  - Power and Control Unit and Cabling
  - Power Cord
  - Stainless Steel Drip Pan
  - FlexChem Reactor Block Rotator

The system is shipped in three (3) boxes when equipped with the General Purpose Rotator.

- Large Box (23"x23"x26") contains:
  - Rotating Oven
  - User Manual
- Medium Box (20"x15"x15") contains:
  - Power and Control Unit and Cabling
  - Power Cord
  - Stainless Steel Drip Pan
  - General Purpose Rotator Loading Stand
- Small Box (15"x15"x6") contains:
  - General Purpose Rotator

*Please verify that all items are received and in good condition.*

## C. Installation

### 1. Using a Fume Hood

The rotating oven unit should only be used in a fume hood with the control unit located outside of the hood.

Make sure there is adequate clearance along the front and right side of the oven to open the door completely.

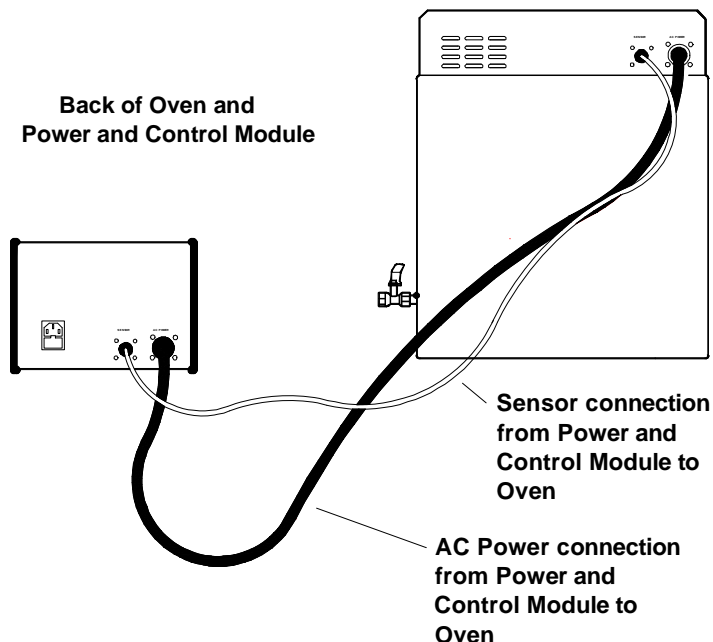
### 2. Connecting Power and Sensor Cables

Insert one end of the black, 1 inch diameter cable to the receptacle labeled AC Power on the back of the power and control unit and the other end to the similarly labeled receptacle on the rotating oven unit. Likewise, connect the thin white cable to the receptacles labeled Sensor on the back of the control and rotating unit.

Plug the power cord provided into the back of the power and control unit and then to a properly grounded outlet. Use only the power cord provided.

### 3. Powering On

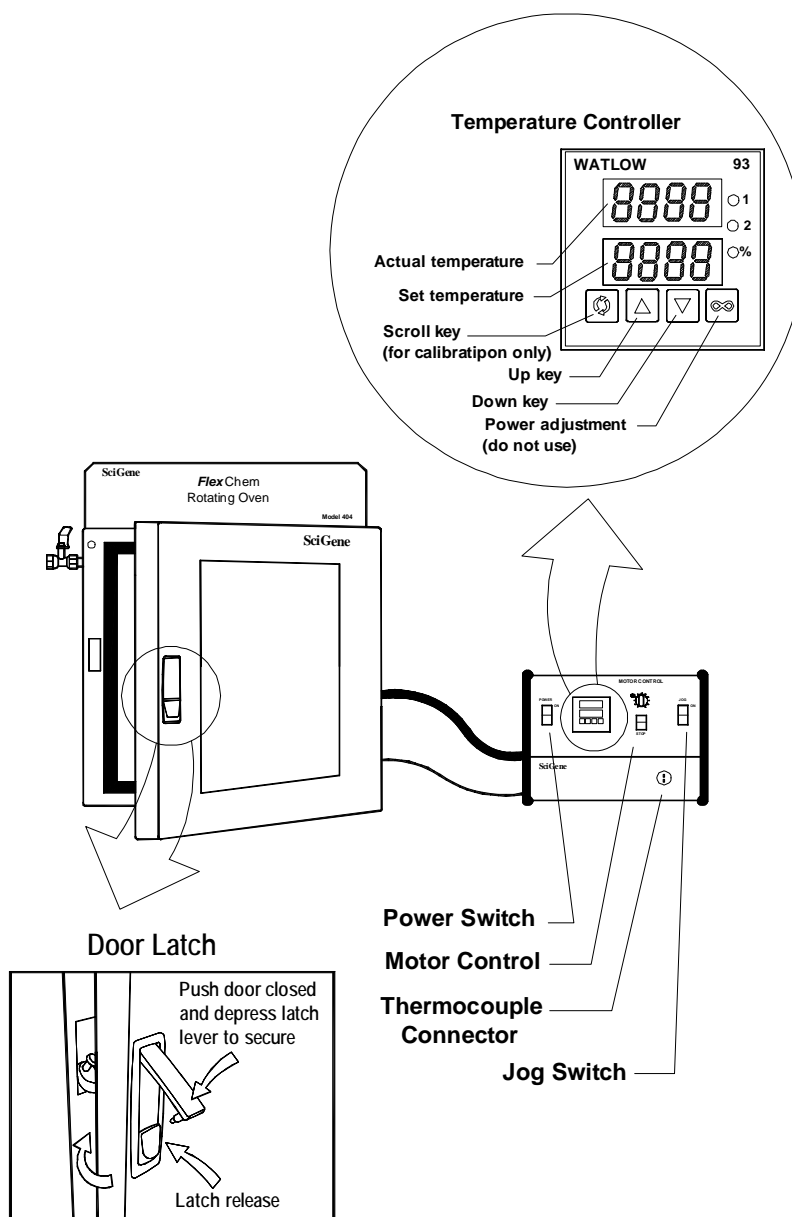
Turn on power to the unit using the switch on the front of the unit.



## III. USING YOUR OVEN

### A. Oven Components and Controls

- **Power Switch** -Turns ON main power to the unit.
- **Temperature Controller** - Used to set and observe chamber temperature
- **Rotator Control** - Controls the speed of the rotator
- **Jog Switch** - Activates rotator with door open at the speed selected
- **Door Latch** - Tightly secures the door closed with button release to open



## B. Closing and Opening the Door

To secure the door closed, press the door against the cabinet and push down the top lever. To open, press the lower latch release button.

## C. Using the Temperature Controller

The features of the Watlow 93 temperature controller on your oven are shown in the illustration on page 6. It has two LED read outs and four membrane buttons.

The upper read out displays the ACTUAL temperature. The lower read out displays the SET chamber temperature. The button with the circle icon at the lower left is used to scroll through the controller parameters when performing calibration of the controller. It is not used during normal operation. The up and down arrow buttons are used to adjust the desired set temperature. They are also used when calibrating the oven. The infinity symbol button on the lower right of the panel is for adjusting the power that is delivered to the chamber heaters. It is set at 100% at the factory and should not be adjusted during normal operation.

To set oven temperature, simply push the up and down arrows until the desired temperature is shown. The unit will now adjust the heat of the chamber until the set temperature is attained.

The controller is calibrated at the factory to provide an accurate chamber temperature when operated between 65 to 99°C. If you intend to use the oven below 65°C, the controller must be calibrated. Consult Section III F. “Calibrating the Oven Temperature” on page 8.

## D. Turning On and Setting Rotator Speed

The rotator is turned on and off with the rocker switch located below the speed control dial. To turn off the rotator drive system, place the switch in the Stop position. To adjust the speed of rotation when power is provided to the drive system, turn the control dial clockwise to set the speed of rotation from 2 to 20 RPM.

## E. Using the Jog Switch

The jog switch is used to momentarily advance the rotator when the door is open. When the jog switch is depressed, the rotator will turn at the speed selected on the speed controller. It will not move if the speed controller is turned off or is set below 2 RPM.



## F. Calibrating the Oven Temperature

All rotators are loaded and removed using the same two-step process. When loading, first insert the end of the shaft that ends in a ball joint with alignment pin into the slotted bearing on the *right* wall of the chamber. The left end of the shaft is then placed into the bearing on the left side of the chamber. Reverse this procedure when removing the rotator.

The temperature controller comes calibrated from the factory to provide accurate chamber temperatures from 65°C to 99°C.

The temperature controller will require calibration only if,

- You plan to use your oven below 65°C; or
- When checking the chamber temperature with a calibrated thermometer, the oven temperature on the thermometer differs by more than one (1) degree from the actual temperature shown on the controller display.

An NIST calibrated digital thermometer (sold separately, SciGene Cat. #1051-52-0) is required to calibrate the oven. The oven must be calibrated at both the high and low end of the range of temperatures it will be used over a range not to exceed 35°C. For example, for the range of temperatures of 50°C to 85°C, calibrate the unit for 50°C operation first then repeat the calibration process for 85°C.

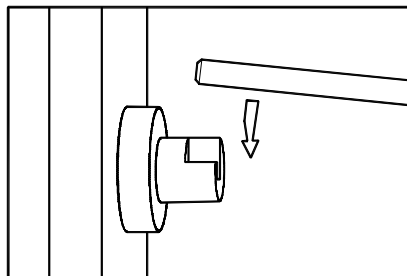
Follow these steps to adjust the controller to achieve an accurate oven temperature.

1. Enter the temperature on the controller for the lowest temperature of the range of temperatures it will be used. Allow the temperature in the unit to stabilize.
2. Using the cable provided with the digital thermometer, plug one end into the blue receptacle found on the back panel and the other into the digital thermometer. Turn on the thermometer using the on/off button on the keypad. The temperature of the chamber will be displayed.
3. On the temperature controller, press both up and down arrows simultaneously for 3 seconds. The upper display will now say “3” and the lower display “Loc”.
4. Using the down arrow, set the upper display to “0” The controller is now unlocked and is available for calibration.
5. Sequentially press the circle icon button until the display shows the ACTUAL and SET temperatures of the oven.

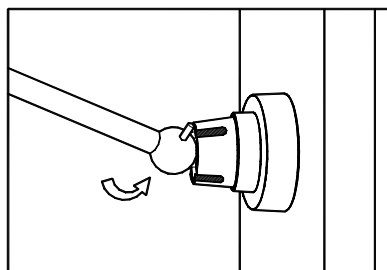
6. Calculate the difference in temperature shown on the ACTUAL display of the controller and the digital thermometer. For example, if the controller displays 52.5°C and the digital thermometer displays 51.0°C; the difference is 1.5°C.
7. Sequentially press the circle icon button until the lower display reads “Cal”. The upper display now shows the offset value between the controller and digital thermometer when the unit was last calibrated.
8. Using the up and down arrows, adjust the off set value to the difference in temperatures calculated in #6. For example, if the controller displays a temperature that is 1.5°C higher than the digital thermometer, adjust the off set value to *minus 1.5*.
9. Sequentially press the circle icon button until the display again shows the ACTUAL and SET temperatures. The actual temperature reported on the display should now match that of the digital thermometer.
10. Sequentially press the circle icon button until “Loc” is shown on the lower display. Press the up arrow until “3” is shown in the upper display.
11. Sequentially press the circle icon button until the actual and set temperatures are again shown on the display.

Your oven is now calibrated for the set temperature you selected. Repeat the calibration process starting at Step 1 for the highest temperature of the range of temperatures you will be using.

### G. Loading and Removing Rotators



Place end of shaft  
on left bearing



Insert shaft ball with  
alignment pin into right bearing

All rotators are loaded and removed using the same two-step process. When loading, first insert the end of the shaft that ends in a ball joint with alignment pin into the slotted bearing on the right wall of the chamber. The left end of the shaft is then placed into the bearing on the left side of the chamber. Reverse this procedure when removing the rotator.

## IV. MAINTAINING YOUR OVEN

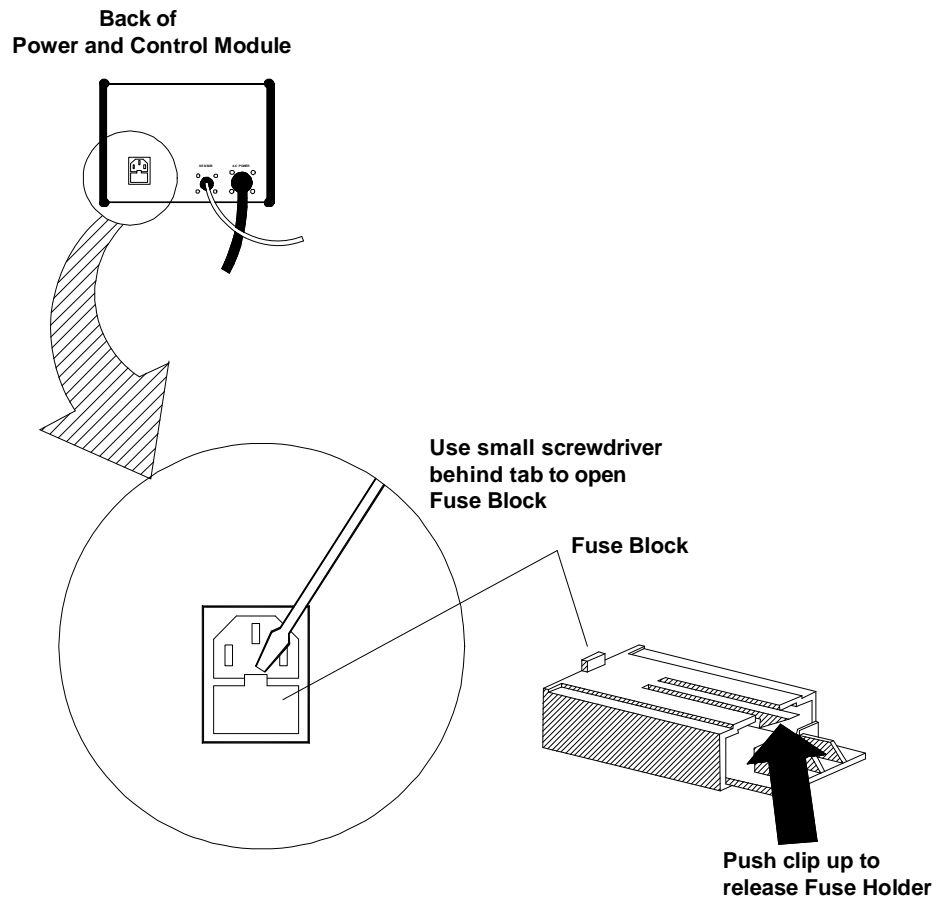
### A. Servicing

Turn the power switch to the off position and unplug the power cord before performing any service procedure.

### B. Checking and Replacing Fuses

Fuses are located in a removable fuse block below the power cord receptacle on the back of the unit.

Unplug the cord and using a flat blade screwdriver, remove the fuse block as shown in the illustration. Remove the fuse holder from the block and gently pry out the two fuses. A blown fuse appears dark. Always replace blown fuse(s) with fuses of amperage and voltage as shown on the label below the fuse block.



## C. Replacing the Temperature Controller

If actual temperature reported on the controller is erratic even after calibration, the temperature controller may need to be replaced. Please contact SciGene Technical Service Department ([techserv@scigene.com](mailto:techserv@scigene.com)) with assistance in troubleshooting the situation. If replacement is required, replacement controllers are available from SciGene (Cat.# RP600-0146-03)

## D. Rotator Drive System

The rotator drive system is designed to provide trouble-free operation for many years and does not require routine maintenance. However, components of the drive system that fail due to normal wear and tear over long term usage can be easily replaced. Contact SciGene's Technical Service Department ([techserv@scigene.com](mailto:techserv@scigene.com)) for assistance in obtaining replacement parts and performing these repairs.

## E. Cleaning

Clean the exterior and interior surfaces using a mild, detergent-based spray cleaner and wipe with a soft cloth.

Under no circumstances should solutions be allowed to enter the electronics package through the ventilation slots on the top of the unit.

Do not use abrasive cleansers or scouring pads that can scratch the stainless steel.

## V. TROUBLESHOOTING

Symptom	Cause	Solution
Rotator does not turn after closing door	Rotator control is in the off position	Turn on rotator.
Door does not shut or is difficult to open	Latch is improperly adjusted	Adjust threaded rod on inside of latch
Temperature is erratic	Thermal controller is defective	Replace controller

## VI. SPECIFICATIONS

Electrical (Oven Unit)	
Cat. #1052-20-1 Cat. #1052-22-1	115/120V AC; 50/60 Hz; 550 W
Cat. #1052-20-2 Cat. #1052-22-2	220/240V AC; 50/60 Hz; 550 W
Dimensions	
Interior Chamber	14W x 14D x 14H inches
	36W x 36D x 36H cm
Exterior	18W x 17D x 22H inches
	45W x 40D x 56H cm
Weight	
Cat. #1052-20-1 Cat. #1052-20-2	Net: 90 lbs (41kg) Gross: 95 lbs (43kg) Includes shipping cartons
Cat. #1052-22-1 Cat. #1052-22-2	Net: 95 lbs (43kg) Gross: 102 lbs (46kg) Includes shipping cartons
Performance and Controls	
Temperature Range	Ambient +5°C to 99°C
Temperature Control	± 0.1°C
Heat up Time	3°C per minute
Temperature Controller	Digital PID, single loop
Temperature Display	Actual/Set Dual LED
Rotation Speed	2 to 20 RPM
Chamber	Stainless Steel
Digital Thermometer Output	Thermocouple

## VII. ROTATORS AND ACCESSORIES

Cat. #	Description	UoM
1040-01-0	Hybridization tube, 35x300mm with screw cap	Each
1040-02-0	Hybridization tube, 35x150mm with screw cap	Each
1040-09-0	Hybridization tube, 75x300mm with vented screw cap	Each
1040-20-5	Replacement Drip Pan for Model 400	Each
1040-21-0	Removable Rocking Platform	Each
1040-21-1	Rotator for 10 large/20 small hybridization tubes	Each
1040-21-2	Maxi-80 Rotator for 80x50ml conical tubes	Each
1040-21-3	Maxi-200 Rotator for 200x15ml tubes	Each
1040-21-4	Maxi-400 Rotator for 400x1.5ml centrifuge tubes	Each
1040-21-5	Maxi-140 Rotator for 40x50mL & 100x15mL plastic tubes.	Each
1040-21-6	Maxi-240 Rotator for 200x1.5mL and 40x50mL tubes.	Each
1040-21-7	Maxi-300 Rotator for 100x15ml tubes & 200x1.5 ml tubes.	Each
1040-21-8	Rotator for six 75x300mm glass tubes	Each
1052-23-0	General Purpose Rotator	Each
1052-24-0	Loading Stand for General Purpose Rotator	Each
1051-52-0	Handheld electronic digital thermometer—includes NIST traceable certificate of calibration	Each