

Axygen® Microtube Shaker

Instruction Manual



Catalog Numbers:

I-4010

I-4011

I-4012



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1.0 Safety Information



CAUTION: Risk of danger – there is material in the instruction manual which must be read, understood, and followed to preserve safety operations and features. Ensure that only trained staff or personnel work with the instrument.



CAUTION:

- ▶ Caution during experimentation as the housing and the microtube shaker blocks can be programmed to reach a temperature of 110°C. Refer to specifications.
- ▶ Pay attention to the residual heat during block exchange and powering off – risk of burn.



Protective ground contact

The socket must be grounded before each use.



- ▶ When working wear personal protective equipment (PPE) to avoid the risk from:
 - Splashing and evaporation of liquids
 - Release of toxic or combustible gases
- ▶ Set up the instrument on a level, stable, clean, non-slip, dry, and fire resistant surface. Do not operate the instrument in explosive atmospheres, with hazardous substances, or under water.
- ▶ Always power off before fitting accessories.
- ▶ Temperature must always be set at least 50°C lower than the fire point of the media used.
- ▶ Be aware of hazards due to:
 - Flammable materials or media with a low boiling temperature
 - Overfilling of media
 - Incorrect use of accessories
- ▶ Process pathogenic materials in closed vessels only.
- ▶ Ensure the instrument and accessories comply with the safety and set up instructions stated in this manual.
- ▶ Do not use damaged components. Safe operation as described in this manual is applicable with the accessories provided by Corning. Accessories must be securely attached to the device.
- ▶ The instrument can only be disconnected from the main power supply by disconnection from the main or the connector plug. The main wall socket plug is the preferred power disconnect method.
- ▶ The voltage stated on the label must correspond to the main power supplied from the region's facility.
- ▶ Ensure that the main power supply cord does not touch the microtube shaker. Do not cover the device.
- ▶ The instrument may only be opened or serviced by authorized service technicians.
- ▶ The Axygen® Microtube shaker is for research use only.

2.0 Design Environments

The instrument is designed for the rapid heating, mixing, and cooling of biologic materials and substrates used in research.

- ▶ Observe the minimum distances between the devices, between the device and the wall and above the assembly (min. 100 mm).
- ▶ This device is not suitable for using in residential areas or other constraints mentioned in Section 1.

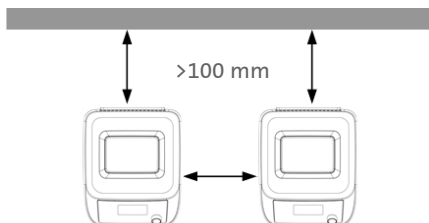


Figure 1. Device placement.

3.0 Unpacking

Unpack the equipment carefully, and check for any damages which may have arisen during transport before use. Please keep original packaging. Please contact the manufacturer/supplier for technical support.



CAUTION: If there is any apparent damage to the system, please do not plug it into the power line. Contact your local Corning support team.

3.1 Package Contents

| Description | Qty/Cs |
|--------------------------|--------|
| Axygen® Microtube shaker | 1 |
| Power supply cords | |
| I-4010 (120V) | 1 |
| I-4011 (230V) | 1 |
| I-4012 (230V) | 1 |
| Instruction manual | 1 |

NOTE: Blocks purchased separately.

3.2 Accessories (sold separately)

| Block | Cat. No. | Description | Speed (rpm) | Well Dimensions (diameter x depth) |
|---|------------|---|-------------|------------------------------------|
|  | I-4010-A | Heating block, holds 0.5 mL tubes (24) | 1,500 | 8.1 x 26 mm |
|  | I-4010-B | Heating block, cone bottom, holds 1.5 mL tubes (24) | 1,500 | 10.9 x 30.8 mm |
|  | I-4010-C | Heating block, round bottom, holds 2 mL tubes (24) | 1,500 | 10.9 x 30.8 mm |
|  | I-4010-D | Heating block, holds 5 mL tubes (8) | 1,500 | 13.6 x 42 mm |
|  | I-4010-E | Heating block, cone bottom, holds 5 mL tubes (8) | 1,400 | 17 x 51.5 mm |
|  | I-4010-F | Heating block, holds 15 mL tubes (8) | 800 | 16.9 x 102.24 mm |
|  | I-4010-G | Heating block, holds 50 mL tubes (4) | 600 | 29.6 x 105.95 mm |
|  | I-4010-H | Heating block for 0.2 mL tubes or 96-well PCR microplates | 1,500 | — |
|  | I-4010-I | Heating block for 96- or 384-well microplates | 1,500 | — |
| — | I-4010-TPC | Block casing for I-4010-A, -B, -C, -E | — | — |
| — | I-4010-PPC | Block casing for I-4010-H, -I | — | — |

4.0 Instrument Overview

4.1 Control

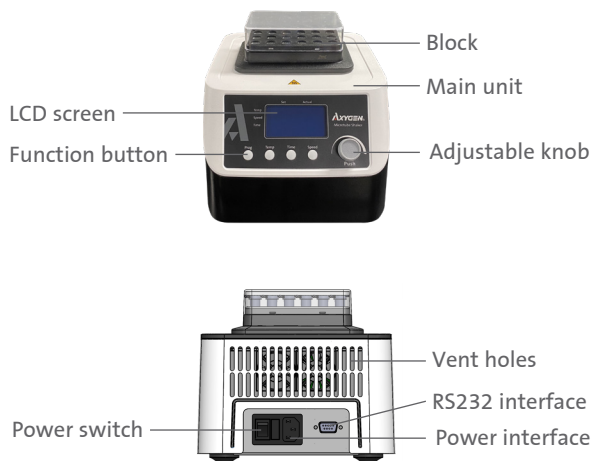


Figure 2. Oxygen® Microtube shaker overview.

| | |
|------------------------|---|
| Block | Interchangeable magnetic attachment; ensure vessel type matches block type. |
| LCD screen | Display to set experiment parameters. |
| Function button | Switches the input parameters or programming. |
| Adjustable knob | At parameter setting state, rotate to alter function values. Press to confirm setting. During operations press to pause/resume, press and hold to stop/end. |
| RS232 interface | Used for temperature calibration. |
| Power interface | Connects the power cord. |
| Power switch | Powers the instrument On/Off |

4.1 Display



| | |
|------------------------|--|
| Set | Displays the setting experiment parameters. |
| Actual | Displays the actual parameters (ramp up/cool down). |
| Prog | Program button, used for programming. |
| Temp | Temperature will flash when selected. |
| Time | Time will flash when selected. During Timed mode, the time will countdown. In continuous operation mode, time will run for the duration of operation (Figure 5). |
| Speed | Speed of the setting area correlate to the 3 mm orbit agitation motion in rpm and will flash when selected. |
| Adjustable knob | At parameter setting state, rotate to alter function values. Press to confirm setting. During operations press to pause/resume, press and hold to stop/end. |

5.0 Instrument Operation

5.1 Parameter Setting

- ▶ Press the function button. The corresponding characters of the setting area will flash.
- ▶ Rotate the parameter knob. Input the target parameters for the experiment.
- ▶ Wait 3 seconds, the corresponding character will stop blinking. Complete parameter setting.

NOTE: When powered On, the Settings screen will display parameters of the last run. When the Time is adjusted to 00:00, the device will run in continuous mode.

5.2 Start and Stop

- ▶ **Start:** Complete the parameter input, push the knob to begin the protocol. Run indicates the experiment is in progress.

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

- ▶ **Pause:** Press the knob once to pause at any time during a Run.

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

In the Actual value column Pause will be displayed during a desired temporary pause in the experiment. When in this state, only the Timer and Mixing functions are paused, the Temperature Control function is still consistent with the temperature at the point of pausing.

- ▶ **Resume:** Press the knob once to resume to the Run while in the Pause phase.
- ▶ **Stop:** Press and hold the knob to stop the current Run.

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

5.3 Running

5.3.1 Single Step Work Without Saving

When powered On, the LCD screen shows the parameters of the last run, or factory settings. Press the Temp, Speed, Time function buttons respectively, the corresponding characters will flash. Rotate the knob to set each parameter according to the standard operating procedure of the experiment. If Time is set to 00:00, it will run in continuous mode. After the setting is completed, press the knob to start work.

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

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

5.3.2 Multiple Step Work Without Saving

- ▶ The program set in the single step is the first step by default.

| | Set | Actual |
|-------|-------|--------|
| Temp. | 30.5 | |
| Speed | 1500 | |
| Timer | 07:00 | |
| Prog. | 1-1 | |

- ▶ Press the Prog function button to generate the second step. The last line in the Set column now shows 1-2.

| | Set | Actual |
|-------|-------|--------|
| Temp. | ---.- | |
| Speed | ----- | |
| Timer | --:-- | |
| Prog. | 1-2 | |

NOTE: Before setting the second step, there is one step by default. But after the Prog setting is complete, the actual steps will be shown correctly once confirmed.

| | Set | Actual |
|-------|-------|--------|
| Temp. | 30.5 | |
| Speed | 1500 | |
| Timer | 07:00 | |
| Prog. | 2-2 | |

- Complete N number of steps Then, press the knob to start work.

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

Prog shows the program and step number. Refer to the figure above, 2-2 refers to the total number of steps and the current step of the run.

NOTE: Before the Time is set, the step will not take effect. If Time is set to 00:00, it will run in continuous mode. Complete the current step input values prior to programming the next step.

5.3.3 Program with Saving mode

Follow programming practices as mentioned in 5.3.2 for Multiple Step procedures. After the program has been built, press and hold, program name characters will flash (refer to the red square in below figure). Rotate the knob to organize each program by a P1-P9 naming system. Input the preferred P# of the newly generated program and keep for your records, then press the knob to complete the input. The program saving is complete now.

| | Set | Actual |
|-------|-------|--------|
| Temp. | 30.5 | |
| Speed | 1500 | |
| Timer | 07:00 | |
| Prog. | P1 | 5-2 |

Prog shows P1, 5-2, means program number 1 has been selected. P1 was saved with 5 steps and currently working through Step 2.

5.3.4 Load Program

While powered On, press and hold the Prog button. This enters the operator into the Load program mode. Rotate the knob to show the saved program, from P1 to the last, at most 9 programs. Switch to the program you want, and press the Prog button to check the program details. Then, press the knob to start or run the program.

5.3.5 Single Function Running

If Temp is set to ---, it means working without temperature control function. When the Time is adjusted to 00:00, the product will run in continuous mode. If speed is set to ----, it means work without mixing function.

5.4 Temperature Calibration

In order to ensure the temperature control accuracy, based on the temperature calibration function, it is recommended to calibrate the temperature whenever the heating block is changed.

The device adopts the three-point temperature calibration method at 10°C, 50°C, and 90°C.

The linear calibration of the three temperature points ensures the accuracy of the three temperature points of the system within $\pm 0.5^{\circ}\text{C}$.

At the time of temperature calibration, the ambient temperature must be 15°C to 25°C.

Calibration procedure

1. Inject silicon oil into the hole in the center of the heating block. Place the thermometer probe in the oil filled hole.
2. Turn the instrument On. Press both the Prog and Temp buttons at the same time to enter into Calibration mode while self-checking only.

NOTE: The instrument cannot enter into Calibration mode if the self-check is complete.



Figure 3. Calibration interface

3. Rotate the Parameter knob to set the target temperature for calibration. Press the parameter knob and confirm the set values.
4. The actual Temp reaches the set temperature and remains constant for 20 to 30 minutes. The calibration area will display the corresponding temperature on the display. Record the measurement on a thermometer, rotate the parameter knob to adjust the calibration Temp to actual thermometer temperature value (Calibration temp. adjustment range is Set temp. $\pm 5^{\circ}\text{C}$), and press the same knob to confirm settings.
5. To ensure the calibration temperature adjustment is set correctly, press the knob and the instrument will enter the second Calibration temperature. Repeat Step 4. After the third temperature calibration is completed, the screen displays Calibration Success on screen, and the instrument will automatically enter into the self-check mode. Then, calibration is complete.

If the display screen shows the “Cali Failed” interface, the input value of calibration may be wrong. Restart the instrument, and repeat the calibration steps again.

5.5 Restore the Factory Settings

1. Turn the instrument On. While the instrument is in self-check mode, press Temp and Prog buttons at the same time to enter into Calibration mode. **NOTE:** The instrument cannot enter into Calibration mode if the self-check is complete.
2. After entering the Calibration mode, press both the Prog and Time buttons to reset, the interface will display RESET Success, and the instrument will restart automatically.

6.0 Trial Run

- ▶ Make sure the required operating voltage and power supply voltage match.
- ▶ Ensure the socket is properly grounded.
- ▶ Add the medium into the vessel.
- ▶ Place the vessel on the block.
- ▶ Plug in the power cord, ensure the power is On and begins initializing.
- ▶ Secure the heating block for the experiment.
- ▶ Set the target parameters or programming.
- ▶ Start working.
- ▶ Observe the LCD display.
- ▶ Stop working, and power Off.

If these operations above are normal, the device is ready to operate. If not, the device may be damaged during transportation, please contact Corning Life Sciences for technical support.

7.0 Troubleshooting

| Problem | Solution |
|-------------------------------|---|
| Instruments will not power On | <ul style="list-style-type: none">▶ Check whether the power line is unplugged.▶ Check whether the fuse is broken or loose. |
| Fault in power On self-test | <ul style="list-style-type: none">▶ Turn Off the unit, then turn On the unit, and reset the instrument to factory default settings. |

If these faults are not resolved, please contact Corning Life Sciences.

8.0 Maintenance and Cleaning

- ▶ Proper maintenance can keep the instrument working properly and lengthen its lifetime.
- ▶ **Do not** spray cleanser or laboratory alcohols into the instrument when cleaning.
- ▶ Unplug the power line when cleaning.
- ▶ Only use recommended cleansers:
 - Dyes: Isopropyl alcohol
 - Construction materials: Water containing tenside/Isopropyl alcohol

- Cosmetics: Water containing tenside/Isopropyl alcohol
 - Food samples: Water containing tenside
 - Fuels: Water containing tenside
- Before using other cleaning solutions than those listed above please check compatibility with Corning Life Sciences prior to use. For safety, wear the proper protective gloves during cleaning of the instrument.



NOTE:

- If you require maintenance service, the instrument must be cleaned in advance to avoid pollution of hazardous substances, and to be sent back in the original packing.
- If the instrument will not be used for a long time, please turn Off and place in a dry, clean, room temperature, and stable location.
- Do not use cleanser within electrical ports.

| | |
|---------------------------------------|---|
| Model | I-4010, I-4011, I-4012 |
| Functions | Heating, cooling, and mixing |
| Temperature range | -15°C ambient to 100°C |
| Temperature setting range | 0.1°C to 100°C |
| Control accuracy (°C at 20°C to 45°C) | ±0.5°C |
| Uniformity (°C at 20°C to 45°C) | Max. ±0.5°C |
| Maximum heating rate | 5.5°C/min. |
| Maximum cooling rate | 5°C/min. (100°C to room temperature) 0.5°C/min. (below room temperature) |
| Speed range | 200 to 1,500 rpm |
| Mixing diameter | 3 mm |
| Display | LCD |
| Program | Up to 6 steps per 9 programs |
| Voltage | 100 to 240V |
| Frequency | 50/60Hz |
| Power | 200W |
| Ambient operation range | +5°C to 40°C, up to 80% RH, non-condensing |

The Axygen® Microtube shaker is designed to be safe when operated under the following conditions:

- Indoor use
- Altitude up to 2,000 meters
- Pollution Degree 2

9.0 Limited Warranty

Corning Incorporated (Corning) warrants that this product will be free from defects in material and workmanship for a period of one (1) year from date of purchase. CORNING DISCLAIMS ALL OTHER WARRANTIES WHETHER EXPRESSED OR IMPLIED, INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE. Corning's sole obligation shall be to repair or replace, at its option, any product or part thereof that proves defective in material or workmanship within the warranty period, provided the purchaser notifies Corning of any such defect. Corning is not liable for any incidental or consequential damages, commercial loss, or any other damages from the use of this product.

This warranty is valid only if the product is used for its intended purpose and within the guidelines specified in the supplied instruction manual. This warranty does not cover damage caused by accident, neglect, misuse, improper service, natural forces, or other causes not arising from defects in original material or workmanship. This warranty does not cover motor brushes, fuses, light bulbs, batteries, or damage to paint or finish. Claims for transit damage should be filed with the transportation carrier.

In the event this product fails within the specified period of time because of a defect in material or workmanship, contact Corning's Customer Service at 800.492.1110. Outside the United States, call +1.978.442.2200 or contact your local Corning sales office.

Corning Customer Service will help arrange local service where available or coordinate a return authorization number and shipping instructions. Products received without proper authorization will be returned. All items returned for service should be sent postage prepaid in the original packaging or other suitable carton, padded to avoid damage. Corning will not be responsible for damage incurred by improper packaging. Corning may elect for onsite service for larger equipment.

Some states do not allow limitation on the length of implied warranties or the exclusion or limitation of incidental or consequential damages. This warranty gives you specific legal rights. You may have other rights which vary from state to state.

No individual may accept for, or on behalf of Corning, any other obligation of liability, or extend the period of this warranty.

For your reference, make a note of the serial and model number, date of purchase, and supplier here.

Model No. _____ Serial No. _____

Date Purchased _____ Supplier _____

10.0 Equipment Disposal



According to Directive 2012/19/EU of the European Parliament and Council of 4th July 2012 on waste and electronic equipment (WEEE) as amended, the Axygen® Microtube Shaker is marked with the crossed-out wheeled bin and must not be disposed of with domestic waste.

Consequently, the buyer shall follow the instructions for reuse and recycling of waste electronic and electrical equipment (WEEE) provided with the products and available at www.corning.com/weee.

Warranty/Disclaimer: Unless otherwise specified, all products are for research use or general laboratory use only.* Not intended for use in diagnostic or therapeutic procedures. Not for use in humans. These products are not intended to mitigate the presence of microorganisms on surfaces or in the environment, where such organisms can be deleterious to humans or the environment. Corning Life Sciences makes no claims regarding the performance of these products for clinical or diagnostic applications. *For a listing of US medical devices, regulatory classifications or specific information on claims, visit www.corning.com/resources.

Corning's products are not specifically designed and tested for diagnostic testing. Many Corning products, though not specific for diagnostic testing, can be used in the workflow and preparation of the test at the customers discretion. Customers may use these products to support their claims. We cannot make any claims or statements that our products are approved for diagnostic testing either directly or indirectly. The customer is responsible for any testing, validation, and/or regulatory submissions that may be required to support the safety and efficacy of their intended application.

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