



Operations Manual

Item: H2020 and H2024 (-E) V1.0



I. Specifications:

Speed:

H2020 Fixed 24 RPM (20RPM for 230V, 50Hz)

H2024 Adjustable from 1 to 70rpm

Temp. Range: Ambient +5 to 60C

Temp. Fluctuation: 0.9C

Max Capacity: 6 x 50ml / 16 x 15ml / 44 x 1.5-2.0ml

Dimensions: (wxdxh) 29.5 x 21.6 x 22.9cm (11.6x8.5x9 in.)

Weight: 9lbs / 4kg

Electrical: 120V, 60HZ or 230V, 50Hz, 2A 250W

Operating environment: 20°C to 45°C

Warranty: 2 years

II. Product Set-Up:

Place the rotator on a clean and stable surface. (Ensure that there is at least 3 inches of open space both in front of and behind the instrument.) Plug the instrument into an outlet of the appropriate voltage.

III. Tube Holder Installation / Exchange:

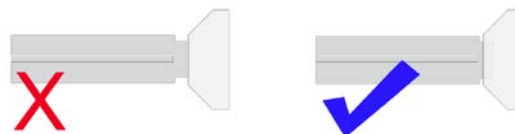
The instrument includes an assortment of tube holders and posts.

ALWAYS attach the tube holder load tubes outside of the incubation chamber. Once fully loaded, then load the posts with tube holders onto the rotating axis. Loading tubes and tube holder within the incubation chamber may result in the dropping of tubes and spillage on the heating surface.

1.5/2.0, 5, 7, 10 and 15ml Tubes:

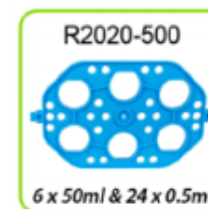


Attach the tube holders (above) to the included post with two arms. Press holders on firmly to prevent them from coming loose during use. Once pressed on firmly, attach the post to the rotator by inserting the post into the left side of the rotator first and then into the main body (right side). Once inserted, rotate the post until it is fully installed, see below:



To adjust the angle of which the tubes rotate, simply rotate the position of the tube holders by hand until the desired rotational angle is achieved.

0.5 and 50ml Tubes



Attach the large tube holder directly to the rotator (without posts.) Insert the holder into the left side of the rotator first and then into the main body (right side). Once inserted, rotate the post until it is fully installed (similar to diagram above).

To rotate tubes horizontally (rolling/hybridization motion), first attach the 2 small posts to the center of the large tube holder. (One post has a small flat that can be inserted to correspond to the flat located in the center of the tube holder). Thread the 2 posts together by turning the post (without flat) clockwise until fully tightener. Then insert posts into the rotator as described above.

To load test-tubes, press them firmly into the appropriate holder. **ALWAYS** ensure a balanced load across both sides of the rotational axis. (When mixing 15 and 50ml tubes, always load a similar quantity of tubes on each side of the rotational axis.)

IV. Product Operation:

Rotator Control (Lower Control Panel)

H2020

The speed of the R2020 is fixed (not adjustable)

Once tubes are properly loaded, press the "Rotator" switch to the "On" position to start the rotation. When mixing is completed, press the switch into the off position.

H2024

Set the Rotational Speed:

The rotational speed can be selected by pressing the up and down keys to adjust the display to the desired speed setting (5 to 70rpm)

Choose the Mixing Mode:

The R2024 offers three additional mixing modes, Mix, Pause and Rock.

To activate, press the "Mode" key, an LED for the activate mode is illuminated. To toggle between modes, press the "Mode" key again. To return to the standard rotating mode, press the "Mode" key until all LED indicators are off.

Temperature Control (Upper control Panel)

Set temperature using the "UP" and "Down" buttons on the upper control Panel.

The set temperature will appear on bottom of display, with the chamber temperature appearing on top of display.

Once the desired temperature is set, press "Start/Stop" to begin heating. The actual temperature (top of display) will rise to match the temperature set on the bottom. Hot surface indicator lights to alert the user that the bottom of the chamber is above a safe contact temperature.



Caution: Hot surface! Once the incubation has begun, the bottom surface of the chamber will become very hot. ALWAYS avoid bodily contact or personal injury may occur.

In-Lab Calibration:

If the incubator is not performing to the desired level of accuracy, the instrument has a recalibration function. To recalibrate:

- Remove all tubes and adjust the empty tube holders to the fully horizontal position (see below). NEVER attempt to recalibrate with the 6 x 50ml tube holder or with any tubes loaded
- Insert a properly calibrated thermocouple (or a partial immersion thermometer) through the port on the top of the lid and line up the immersion point with the lid surface.



- Set the rotator to the "On" position with a recommended speed of 20-25rpm.
- Set the desired temperature and press the "Start/Stop Key". Allow 60 minutes for the desired temperature to equilibrate.
- Read the temperature of the external thermocouple/thermometer and note the difference from the set temperature. (For example, if the set Temperature is 40C and the measured temperature is 39.8C, the difference equals -0.2.
- Press and HOLD the start stop key for 5 seconds and adjust the value by -0.2C.
- Press and hold the "Start/Stop" key to save the calibration and return to the standard operating mode.

IV. Care and Maintenance:

No routine maintenance is required other than to keep the unit clean. Cleaning can be done with a damp cloth. Avoid the use of harsh solvents.

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Service and Contact: In the event that service or technical support is required, please contact **Benchmark** by phone at **1-908-769-5555** or by email at info@benchmarkscientific.com.