

RDT SERIES

Laboratory Tube Mixers

PRODUCT MANUAL

Models: RDT4510 | RDT4516

Variable-Speed Tube Mixers

For Clinical, Diagnostic, and Research Laboratory Applications



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1. Product Overview

The RDT Series laboratory tube mixers are engineered for gentle, reproducible mixing of biological and chemical samples used in clinical, diagnostic, and research laboratories. The RDT Series is divided into two main categories: the RDT300 Series (fixed-speed, 24 rpm) and the RDT400 Series (variable-speed, 5–30 rpm), each available in single-layer and double-layer configurations with Type A (standard) or Type B (extended) trays. This manual covers the variable-speed RDT400 Series models.

Intended Use

RDT Series mixers are designed for mixing sample tubes containing blood, plasma, reagents, buffers, and biological specimens. They are suitable for use in standard laboratory environments, temperature-controlled incubators, and cold rooms.

2. Product Details

The following table provides a side-by-side comparison of all models in the RDT400 Series to assist in selecting the appropriate instrument for your application.

Model	Speed	Speed Range	Timer	Layers	Positions	Pause Button
RDT4510	Variable	5-30RPM	0-30min	1	10	Yes
RDT4516	Variable	5-30RPM	0-30min	1	16	Yes

3. Safety Information

Read all safety instructions before operating any RDT Series instrument. Failure to follow these instructions may result in instrument damage, sample contamination, or personal injury.

General Safety Precautions

- Do not operate the instrument with damaged tubes, cracked containers, or improperly sealed samples.
- Ensure all tube caps are securely fastened before loading. Mixing will cause spillage from unsecured containers.
- Do not exceed the rated tube positions. Overloading may cause mechanical imbalance and reduce instrument lifespan.
- Position the instrument on a stable, level surface or ensure it is properly secured within its incubator or cold room installation.
- Do not operate in environments with flammable gases or explosive atmospheres.
- Do not disassemble or modify the instrument. Refer all service to qualified personnel.
- Disconnect power before cleaning or performing maintenance.
- Use only the power adapter and voltage specifications indicated on the instrument label.

Biological Safety

- Handle all biological samples in accordance with institutional biosafety protocols and applicable regulations and standards.

- When working with infectious or hazardous materials, always use appropriate personal protective equipment (PPE).
- Decontaminate the instrument surfaces after exposure to biohazardous materials following your facility's standard operating procedures.

4. Installation and Setup

4.1 Unpacking

Carefully remove the instrument from its packaging. Inspect for any shipping damage before proceeding. Retain the original packaging materials for future transport. Verify that all components listed in the packing slip are present.

4.2 Environmental Requirements

- Operating temperature: 2°C to 40°C (compatible with standard laboratory incubators and cold rooms)
- Relative humidity: 20%–80%, non-condensing
- Place on a stable, vibration-free surface or mount securely within a temperature-controlled enclosure
- Ensure adequate clearance around the instrument for ventilation and safe operation

4.3 Power Connection

Before connecting power, verify that your local supply voltage matches the specification on the instrument label. Connect RDT400 Series using supplied power adapter (Input: AC 100–240V / 0.6A; Output: DC 24V / 1A) to a suitable outlet. Never operate an instrument on an incompatible power supply.

4.4 Loading Tubes

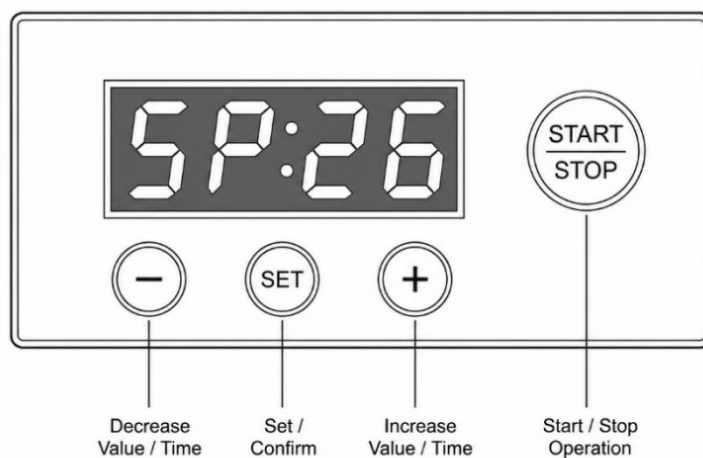
Place sample tubes into the tray positions, ensuring each tube is within the designated tube wells. Distribute tubes evenly across the tray to maintain mixing balance. For partial loads, distribute tubes symmetrically to minimize vibration. Ensure all caps are tightly closed before initiating mixing.

5. Setup and Operation

5.1 Variable-Speed Models (RDT4510, RDT4516)

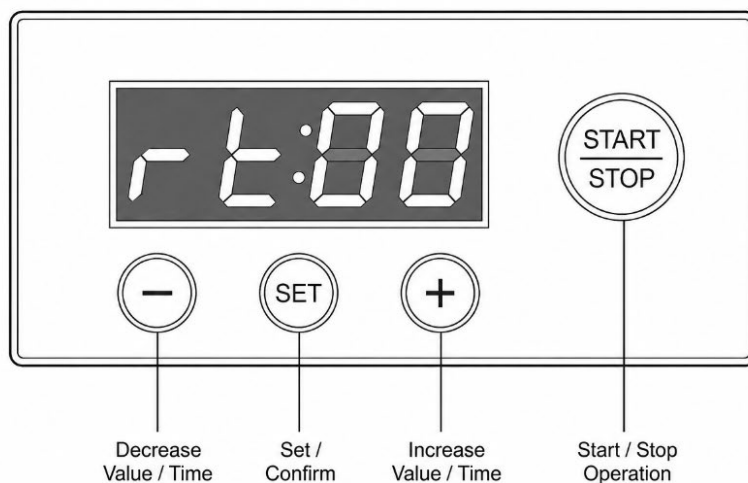
Variable-speed models provide adjustable mixing speeds from 5 to 30 rpm and can operate using a programmable timer or in continuous operation mode.

5.2 Setting Speed



Press the SET button once. The display will show **SP** for SPEED. Use the plus (+) and minus (-) buttons to select the desired speed. The speed range is 5-30 rpm

Setting run time



Press the SET button again. The display will show **rt** for run time. Use the plus (+) and minus (-) buttons to select the desired run time. The run time can be set from 1 to 30 minutes.

NOTE: When the timer is enabled, the colon (:) on display will be blinking.

To run continuously (no timer): Set **rt** to 00.

NOTE: When the timer is disabled, the colon (:) on the display does not blink.

5.3 Starting the Mixer

1. Connect the supplied power adapter to the mixer and a suitable electrical outlet.
 2. Turn the power switch ON.
 3. Adjust the mixing speed as required.
 4. Set the desired run time (1–30 minutes) or select Continuous operation by setting RT to 00.
 5. Press the Start/Stop button to begin mixing.
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5.4 During Operation

1. Press the Red Pause button to temporarily stop tray movement without changing the programmed speed or timer settings.
 2. Press the Red Pause button again to resume mixing.
 3. Pressing the Start/Stop button stops the mixing cycle and resets the timer to the preset value.
 4. Pressing the Red Pause button while the timer is running also resets the timer to the preset value before resuming operation.
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5.5 Stopping the Mixer

1. Press the Start/Stop button to stop mixing.
 2. Turn the power switch OFF.
 3. Disconnect the power adapter before cleaning, maintenance, or long-term storage.
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5.6 Timer Display

During the final minute of a timed run, the display automatically changes from minutes to seconds. When RT is set to 00, the mixer operates continuously until stopped manually.

NOTE: The Red Pause button is a momentary pushbutton and does not indicate its current operating state.

NOTE: Pressing either the Start/Stop button or the Red Pause button during a timed run resets the timer to the programmed value.

5.7 Application Guidelines

Mixing ensures continuous, gentle agitation that prevents cells from settling, maintains sample uniformity, and avoids the foaming or shear stress caused by vortexing or other high-agitation methods. This makes it especially well-suited for the following applications:

- Whole blood mixing for hematology and coagulation assays
- Blood bank sample preparation and reagent homogenization
- Immunoassay incubation and bead-based assay protocols
- Nucleic acid hybridization and extraction procedures
- Reagent and buffer preparation in clinical and research settings

6. Maintenance and Care

6.1 Routine Cleaning

Disconnect the instrument from power before cleaning. Wipe exterior surfaces with a damp cloth moistened with a mild laboratory detergent or 70% isopropanol. Do not allow liquids to enter the motor housing or electrical components. Do not use abrasive cleaners, strong solvents, or bleach on the exterior housing.

6.2 Decontamination

For decontamination of the tray surface and tube holders following biohazard exposure, apply a suitable disinfectant in accordance with your facility's biosafety protocols. Allow adequate contact time before wiping clean with a damp cloth. Ensure no residue remains on contact surfaces before resuming use.

6.3 Inspection

Periodically inspect the instrument for signs of wear, damage to the tray mechanism, deterioration of tube retaining components, or unusual vibration during operation. If any abnormality is observed, discontinue use and contact your authorized service representative.

6.4 Storage

When not in use for extended periods, clean the instrument thoroughly, disconnect from power, and store in a clean, dry environment within the temperature and humidity ranges specified for operation. Use the original packaging or a suitable protective cover to prevent dust accumulation.

7. Individual Product Specifications

The following sections provide detailed specifications and feature descriptions for each model in the RDT Series Mixers.

Tray Type A – standard size with silicone mat for 10 positions

Tray Type B – extended size with silicone mat for 16 positions

RDT4510 | Variable Speed Mixer

Variable-speed (5–30 rpm) single-layer mixer, 10 positions Tray Type A

The **RDT4510** is a variable-speed, single-layer tube mixer designed for gentle, continuous mixing of biological and chemical samples. Featuring **10 tube positions** and an adjustable mixing speed from **5 to 30 rpm**, it provides precise control over mixing intensity for a wide range of sample types and laboratory protocols. Its compact, space-saving design makes it ideal for laboratory benches, incubators, and cold rooms. The RDT4510 is well suited for applications ranging from gentle blood cell suspensions, immunoassay incubations, and nucleic acid hybridizations to procedures requiring more vigorous agitation, making it a versatile choice for clinical, diagnostic, and research laboratories.

Key Features

- Adjustable speed 5–30 rpm for precise control over mixing intensity
- Programmable 0–30 minute timer with continuous operation mode for precise, unattended mixing protocols
- 10-position single-layer format for standard tube sizes
- Non-slip double sided silicone mat
- Red Pause button for convenient stop-and-go operation
- Gentle to vigorous mixing — adaptable to a wide range of protocols
- Compact design fits standard laboratory and cold room environments
- Ideal for blood, immunoassay, hybridization, and biological sample mixing

Technical Specifications

Model Number	RDT4510
Product Type	Tube Mixer — Variable-Speed
Configuration	Tray Type A
Tube Positions	10
Number of Layers	1
Speed	5–30 rpm
Timer	0-30 min; 0 = continuous operation
Power Supply	AC 110 V, 60 Hz, 8 W
Warranty	1 Year

RDT4516 | Variable Speed Mixer

Variable-speed (5–30 rpm) single-layer mixer, 16 positions, Tray Type B

The **RDT4516** is a variable-speed, single-layer tube mixer designed for gentle, continuous mixing of biological and chemical samples. Featuring an **extended tray with 16 tube positions** and an adjustable mixing speed from **5 to 30 rpm**, it provides precise control over mixing intensity while accommodating larger sample volumes and higher throughput. Its increased capacity makes it ideal for laboratories processing larger batches of samples under controlled, reproducible mixing conditions. The adjustable **5 to 30 rpm** speed range supports a broad spectrum of applications, from delicate cell suspensions, immunoassay incubations, and nucleic acid hybridizations to more vigorous reagent mixing, making the RDT4516 a versatile choice for clinical, diagnostic, and research laboratories.

Key Features

- Adjustable speed 5–30 rpm for precise control over mixing intensity
- Programmable 0–30-minute timer with continuous operation mode for precise, unattended mixing protocols
- 16-position single-layer format for standard tube sizes
- Non-slip double sided silicone mat
- Red Pause button for convenient stop-and-go operation
- Gentle to vigorous mixing — adaptable to a wide range of protocols
- Compact design fits standard laboratory and cold room environments
- Ideal for blood, immunoassay, hybridization, and biological sample mixing

Technical Specifications

Model Number	RDT4516
Product Type	Tube Mixer — Variable-Speed
Configuration	Tray Type B
Tube Positions	16
Number of Layers	1
Speed	5–30 RPM
Timer	0-30 min; 0 = continuous operation
Power Supply	AC 110V, 60Hz, 8W
Warranty	1 Year

8. Troubleshooting

Symptom	Possible Cause	Corrective Action
Instrument does not start	No power supply / loose connection	Verify power connection and outlet functionality. Check that the power switch is in the ON position.
Excessive vibration during operation	Uneven tube loading or unbalanced sample distribution	Redistribute tubes symmetrically across the roller. Ensure tubes are of similar weight and volume.
Irregular or intermittent mixing	Mechanical obstruction or layer damage	Inspect tray for obstructions. If damage is observed, discontinue use and contact service.
Speed inconsistency (variable-speed models)	Speed control set incorrectly or dial malfunction	Verify speed control setting. If problem persists, contact authorized service.
Unusual noise during operation	Foreign object in tray mechanism	Power off the instrument, inspect the tray and tube positions, remove any foreign material.
Instrument stops unexpectedly	Thermal overload protection has been activated	Power off and allow the instrument to cool for 15 minutes before restarting. Ensure ventilation is not obstructed.

If the issue cannot be resolved using the guidance above, discontinue use of the instrument and contact your authorized service representative or distributor. Do not attempt to open the instrument housing or perform internal repairs.

9. Warranty and Regulatory Information

9.1 Warranty

All RDT Series instruments are warranted against defects in materials and workmanship for a period of one (1) year from the date of purchase. The warranty covers repair or replacement of defective components at the manufacturer's discretion. The warranty is void if the instrument has been misused, modified, damaged due to improper power supply, or serviced by unauthorized personnel.

9.2 Disposal

Dispose of this instrument in accordance with local and national regulations for electrical and electronic equipment (WEEE). Contact your local authorized dealer or recycling authority for guidance on compliant disposal.