RDT SERIES

Laboratory Tube Rotator Mixers

PRODUCT MANUAL

Models: RDT3510 | RDT3516 | RDT3720 | RDT3732 | RDT4510 | RDT4516

Fixed-Speed and Variable-Speed End-Over-End Tube Rotators

For Clinical, Diagnostic, and Research Laboratory Applications

Certification: CE | Warranty: 1 Year | Origin: China

1. Product Overview

This manual covers the RDT Series laboratory tube rotator mixers — a family of end-over-end rotators engineered for gentle, reproducible mixing of biological and chemical samples in clinical, diagnostic, and research laboratory environments. The 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) roller formats.

Intended Use

RDT Series mixers are designed for end-over-end rotation of 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.

Series Overview

The RDT300 Series provides a simple, fixed-speed solution for routine mixing tasks where reproducibility and simplicity are paramount. The RDT400 Series expands upon this with adjustable rotation speed, accommodating a wider variety of protocols and sample sensitivities. Within each series, single-layer models (Type A and Type B) offer a compact footprint, while double-layer models double throughput within the same installation envelope.

2. Product Comparison

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

Model	Series	Speed	Layers	Positions	Roller Type	Power (W)
RDT3510	RDT300	Fixed	1	10	Type A	8
RDT3516	RDT300	Fixed	1	16	Type B	16
RDT3720	RDT300	Fixed	2	20	Type A	—
RDT3732	RDT300	Fixed	2	32	Type B	—
RDT4510	RDT400	Variable	1	10	Type A	—
RDT4516	RDT400	Variable	1	16	Type B	—

Type A rollers are standard length; Type B rollers are extended to accommodate additional tube positions or larger tube formats. Double-layer configurations stack two rows of tube positions to maximize sample throughput without increasing the instrument's footprint.

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. End-over-end rotation 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.
- When working with infectious or hazardous materials, use appropriate personal protective equipment (PPE) at all times.
- 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. For models RDT3510 and RDT3516, connect directly to AC 110V, 60Hz outlet. For the RDT3720, connect the supplied power adapter (Input: AC 100–240V / 0.6A; Output: DC 24V / 1A) to a suitable outlet. Refer to the product-specific specifications for all other models. Never operate an instrument on an incompatible power supply.

4.4 Loading Tubes

Place sample tubes into the roller positions, ensuring each tube is secured by the retaining clips or within the designated tube wells. Distribute tubes evenly across the roller to maintain rotational balance. For partial loads, distribute tubes symmetrically to minimize vibration. Ensure all caps are tightly closed before initiating rotation.

5. Operation

5.1 Fixed-Speed Models (RDT3510, RDT3516, RDT3720, RDT3732)

Fixed-speed models operate at a constant 24 RPM. To start the instrument, connect it to the appropriate power supply and activate the power switch. The roller will begin end-over-end rotation at the preset speed. No speed adjustment is required or available. To stop mixing, turn off the power switch or disconnect from the power supply.

5.2 Variable-Speed Models (RDT4510, RDT4516)

Variable-speed models allow rotation to be adjusted between 5 and 30 RPM using the speed control dial or interface on the instrument. To set the desired mixing speed, turn the control to the indicated position before or after initiating rotation. Refer to the protocol requirements for your specific application to determine the appropriate speed setting. Typical recommendations are: 5–10 RPM for delicate cell suspensions and fragile samples; 10–20 RPM for standard biological and reagent mixing; 20–30 RPM for vigorous homogenization of viscous samples.

5.3 Application Guidelines

End-over-end rotation provides continuous, gentle mixing that prevents cell settling, maintains sample homogeneity, and avoids the foaming or shear stress associated with vortexing or agitation methods. It is particularly well suited to 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 roller 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 roller 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.

RDT3510 | Fixed-Speed Mixer

Fixed-speed single-layer mixer, 10 positions, Type A

The RDT3510 is a fixed-speed single-layer tube rotator designed for gentle, continuous end-over-end mixing of biological and chemical samples. With 10 tube positions and a Type A (standard length) roller format, it accommodates a variety of common tube sizes used in clinical, research, and diagnostic laboratories. Fixed-speed operation simplifies setup and ensures reproducible mixing conditions, while the single-layer design keeps the instrument compact and easy to use within standard laboratory incubators or cold rooms.

Key Features

- Fixed-speed end-over-end rotation for gentle, consistent sample mixing
- 10-position single-layer design for standard tube formats
- Type A (standard length) configuration for common lab tube sizes
- Compact single-layer design — fits in incubators and cold rooms
- Suitable for blood, reagent, and biological sample mixing in clinical and research labs

Technical Specifications

Model Number	RDT3510
Product Type	Tube Rotator — Fixed-Speed
Configuration	Single-Layer, Type A
Tube Positions	10
Number of Layers	1
Rotation Speed	24 RPM (fixed)
Speed Range	Fixed
Power Supply	AC 110V, 60Hz, 8W
Country of Origin	China
Certifications	CE
Warranty	1 Year
Barcode	00850084643323
Status	ACTIVE

RDT3516 | Fixed-Speed Mixer

Fixed-speed single-layer mixer, 16 positions, Type B (longer)

The RDT3516 is a fixed-speed single-layer tube rotator with an extended Type B roller to accommodate 16 tube positions — making it the higher-capacity companion to the RDT3510 in the same product family. The longer roller format supports larger tubes or greater sample volumes per run, reducing the number of mixing cycles required in high-throughput workflows. Fixed-speed operation ensures reproducible gentle mixing conditions for blood, reagents, and biological specimens in clinical, diagnostic, and research laboratory environments.

Key Features

- Extended Type B roller accommodates 16 tube positions for higher throughput
- Fixed-speed end-over-end rotation for gentle, reproducible mixing
- Single-layer design for compact installation in incubators and cold rooms
- Supports larger tubes and greater sample volumes per run
- Ideal for blood, reagent, and biological sample mixing

Technical Specifications

Model Number	RDT3516
Product Type	Tube Rotator — Fixed-Speed
Configuration	Single-Layer, Type B (Extended)
Tube Positions	16
Number of Layers	1
Rotation Speed	24 RPM (fixed)
Speed Range	Fixed
Power Supply	AC 110V, 60Hz, 16W
Country of Origin	China
Certifications	CE
Warranty	1 Year
Barcode	00850084643330
Status	ACTIVE

RDT3720 | Fixed-Speed Mixer

Fixed-speed double-layer mixer, 20 positions, Type A

The RDT3720 is a fixed-speed double-layer tube rotator that doubles the capacity of the RDT3510 by stacking two rows of 10 tube positions — totaling 20 positions — within the same compact Type A footprint. The dual-layer design maximizes throughput without requiring additional bench or incubator space, making it an efficient choice for labs processing high sample volumes. Consistent fixed-speed end-over-end rotation ensures reliable, gentle mixing performance across all 20 positions simultaneously.

Key Features

- Double-layer design with 20 positions — twice the capacity of single-layer models
- Fixed-speed end-over-end rotation for uniform mixing across all positions
- Type A format — compact footprint fits standard incubators and cold rooms
- Maximizes throughput without additional bench space
- Ideal for high-volume blood, reagent, and biological sample processing

Technical Specifications

Model Number	RDT3720
Product Type	Tube Rotator — Fixed-Speed
Configuration	Double-Layer, Type A
Tube Positions	20
Number of Layers	2
Rotation Speed	24 RPM (fixed)
Speed Range	Fixed
Power Supply	Power Adapter — Input: AC 100–240V / 0.6A, Output: DC 24V / 1A
Country of Origin	China
Certifications	CE
Warranty	1 Year
Barcode	00850084643347
Status	ACTIVE

RDT3732 | Fixed-Speed Mixer

Fixed-speed double-layer mixer, 32 positions, Type B (longer)

The RDT3732 is the highest-capacity fixed-speed mixer in the RDT300 series, offering 32 tube positions across a double-layer Type B (extended length) roller. This configuration is designed for high-throughput laboratory environments where large numbers of samples must be mixed simultaneously and consistently. Fixed-speed end-over-end rotation ensures gentle, reproducible mixing conditions across all 32 positions, making the RDT3732 an efficient workhorse for blood banks, clinical laboratories, and research facilities with demanding daily sample volumes.

Key Features

- 32-position double-layer design — maximum capacity in the RDT300 series
- Extended Type B roller supports larger tubes and higher sample volumes
- Fixed-speed end-over-end rotation for reproducible, gentle mixing
- Ideal for blood banks, clinical labs, and high-throughput research facilities
- Consistent mixing across all 32 positions simultaneously

Technical Specifications

Model Number	RDT3732
Product Type	Tube Rotator — Fixed-Speed
Configuration	Double-Layer, Type B (Extended)
Tube Positions	32
Number of Layers	2
Rotation Speed	24 RPM (fixed)
Speed Range	Fixed
Power Supply	See product documentation
Country of Origin	China
Certifications	CE
Warranty	1 Year
Barcode	00850084643354
Status	ACTIVE

RDT4510 | Variable Speed Mixer

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

The RDT4510 variable-speed single-layer tube rotator provides adjustable rotation from 5 to 30 rpm, giving laboratory operators precise control over mixing intensity for a wide range of sample types and protocols. With 10 tube positions in a compact Type A format, it is well-suited for applications requiring gentle handling — such as blood cell suspensions, immunoassay incubations, and nucleic acid hybridizations — as well as those requiring more vigorous agitation. Variable-speed capability makes the RDT4510 a versatile, protocol-adaptable choice for research, clinical, and diagnostic laboratories.

Key Features

- Adjustable speed 5–30 rpm for precise control over mixing intensity
- 10-position single-layer Type A format for standard tube sizes
- Gentle to vigorous mixing — adaptable to a wide range of protocols
- Compact design fits standard incubators and cold room environments
- Ideal for blood, immunoassay, hybridization, and biological sample mixing

Technical Specifications

Model Number	RDT4510
Product Type	Tube Rotator — Variable-Speed
Configuration	Single-Layer, Type A
Tube Positions	10
Number of Layers	1
Rotation Speed	5–30 RPM (adjustable)
Speed Range	Variable
Power Supply	See product documentation
Country of Origin	China
Certifications	CE
Warranty	1 Year
Barcode	00850084643361
Status	ACTIVE

RDT4516 | Variable Speed Mixer

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

The RDT4516 combines the protocol flexibility of variable-speed rotation (5–30 rpm) with an extended Type B roller that accommodates 16 tube positions — offering greater capacity than the RDT4510 while retaining full speed adjustability. It is designed for laboratories processing larger batches of samples under controlled, reproducible mixing conditions. The 5 to 30 rpm range covers a broad spectrum of mixing applications, from delicate cell suspensions to standard reagent homogenization, across clinical, research, and diagnostic environments.

Key Features

- Variable speed 5–30 rpm for protocol-specific mixing control
- 16-position extended Type B roller for higher sample throughput
- Single-layer compact design for incubator or cold room installation
- Suitable for cell suspensions, reagent mixing, and immunoassay incubation
- Reproducible end-over-end rotation for consistent results

Technical Specifications

Model Number	RDT4516
Product Type	Tube Rotator — Variable-Speed
Configuration	Single-Layer, Type B (Extended)
Tube Positions	16
Number of Layers	1
Rotation Speed	5–30 RPM (adjustable)
Speed Range	Variable
Power Supply	See product documentation
Country of Origin	China
Certifications	CE
Warranty	1 Year
Barcode	00850084643378
Status	ACTIVE

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 rotation	Mechanical obstruction or roller damage	Inspect roller 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 roller mechanism	Power off the instrument, inspect the roller and tube positions, remove any foreign material.
Instrument stops unexpectedly	Thermal overload protection 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 CE Certification

All models in the RDT Series carry the CE marking, indicating conformity with applicable European Union directives for safety, electromagnetic compatibility, and health. CE certification applies to all active models: RDT3510, RDT3516, RDT3720, RDT3732, RDT4510, and RDT4516.

9.3 Country of Origin

All RDT Series instruments are manufactured in China under quality management standards consistent with laboratory equipment industry requirements.

9.4 Disposal

Dispose of this instrument in accordance with local and national regulations for electrical and electronic equipment (WEEE). Do not dispose of in general waste. Contact your local authorized dealer or recycling authority for guidance on compliant disposal.