TORONTECH

MULTIPURPOSE HIGH SPEED CENTRIFUGE (4 X 250 ML)

Multipurpose High Speed Centrifuge (4 x 250 mL) - ToronCent™ HS MP

ToronCent™ HS MP multipurpose high speed centrifuge covers routine and demanding separations on one benchtop drive, reaching 19,000 rpm and 25,100 x g. Fifteen rotor options accept 0.2 mL microtubes, 250 mL bottles, PCR plates, ELISA microplates, and deep-well plates. Laboratories that would otherwise buy a microcentrifuge and a separate clinical unit can consolidate both workloads here. The instrument weighs 48 kg and occupies a 436 mm wide footprint.

Swing rotors hold four 250 mL buckets for bulk work, while angle rotors spin as many as 48 microtubes at speeds that pellet fine precipitates. Automatic rotor identification reads the installed rotor and caps its speed, so an operator cannot over-speed a low rated carrier. The aerodynamic oval bucket cuts air resistance inside the chamber, which lowers noise and power draw during long runs. Total consumption stays at 650 W.

A 7-inch touchscreen responds through gloves and takes direct numeric entry for speed, RCF, time, and ramp profile. Stored programs support five-step centrifugation, so a gradient or wash sequence runs unattended as a single method. Run logs and diagnostic records display on screen for traceability. Self-diagnostic routines watch door interlock, over-speed, motor temperature, and communication faults. Acceleration to full speed takes as little as 10 seconds.

APPLICATIONS

Multipurpose High Speed Centrifuge (4 x 250 mL) - ToronCent™ HS MP Applications

The ToronCent™ HS MP suits shared laboratories and core facilities where one instrument has to cover microliter separations, bulk clarification, and plate work.

- **Cell Culture and Bioprocessing**: harvests mammalian and bacterial cells in 100 mL and 250 mL bottles, then pellets washed cells in 15 mL and 50 mL conical tubes
- **Clinical and Diagnostic Laboratories**: separates serum, plasma, and buffy coat, processing up to 68 vacuum blood collection tubes per cycle in the rectangular bucket configuration
- **Molecular Biology and Genomics**: spins PCR plates, spin columns, and nucleic acid precipitates using the microtube rotors and the plate carrier
- **Immunoassay and ELISA Workflows**: collects reagents and removes bubbles in 96-well ELISA plates, deep-well plates, and filter plate reagent kits
- **Protein Purification and Biochemistry**: clarifies lysates and recovers precipitates at up to 25,100 x g in the high speed angle rotors
- **Pharmaceutical Quality Control**: separates suspensions and prepares samples for chromatographic and spectroscopic analysis
- **Food and Beverage Analysis**: splits fat, solids, and aqueous phases in dairy, juice, and beverage samples for compositional testing
- **Environmental and Water Testing**: concentrates suspended solids, sediment, and microbial biomass ahead of analysis
- **Veterinary Diagnostics**: handles animal blood, urine, and tissue samples across species with differing draw volumes
- **Teaching and Academic Laboratories**: gives students one platform for microtube, conical tube, and plate protocols without switching instruments


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ToronCent™ HS MP
Multipurpose High Speed Centrifuge
(4 x 250 mL)

FEATURES

Multipurpose High Speed Centrifuge (4 x 250 mL) - ToronCent™ HS MP Key Features

The ToronCent™ HS MP pairs a wide rotor library with programmable multi-step methods and layered mechanical protection.

- **19,000 rpm Maximum Speed and 25,100 x g**: pellets fine precipitates and subcellular fractions that general purpose lab centrifuges cannot bring down
- **15 Rotor Options**: covers 0.2 mL microtubes, 250 mL bottles, PCR plates, ELISA microplates, deep-well plates, and filter plate kits on one drive
- **4 x 250 mL Swing Rotor Capacity**: processes a liter per cycle with oval or rectangular buckets, giving flat pellets and a clean supernatant boundary
- **Five-Step Programmable Centrifugation**: chains multiple speeds and hold times into a single stored method, so staged washes and gradients run without operator intervention
- **11 Acceleration and 12 Deceleration Profiles**: matches the ramp to the sample and prevents re-emulsification or pellet disturbance, with the tenth profile available for custom timing
- **Automatic Rotor Identification**: recognizes the installed rotor and applies its speed ceiling as over-speed protection
- **10-Second Acceleration**: shortens cycle time and reduces the interval samples spend at intermediate speeds
- **7-Inch Glove-Compatible Touchscreen**: registers input through gloves and shows setpoints beside live running values, so operators track a run without switching screens
- **Direct Numeric Parameter Entry**: accepts speed, RCF, time, and ramp values by keypad rather than knob, improving repeatability across shifts
- **Automated Lid Locking**: secures the chamber before the rotor spins and holds it closed until the rotor comes to rest
- **Multi-Point Self-Diagnostics**: monitors door interlock faults, over-speed conditions, motor overheating, misoperation, and communication errors, with alerts on screen
- **On-Screen Run and Diagnostic Logs**: keeps cycle history and fault records available at the instrument for troubleshooting and batch traceability

- **Aerodynamic Oval Bucket**: reduces windage drag inside the chamber, which lowers noise, heat generation, and energy consumption
- **Quiet Operation at ≤65 dB(A)**: keeps sound suitable for open bench and shared laboratory placement
- **One-Piece Molded Panel and Lid**: presents a seamless surface that wipes down quickly and resists chemical spill ingress

THEORY & METHOD

Theory and Method

Centrifugation accelerates sedimentation by spinning samples around a fixed axis, creating a radial field far stronger than gravity. Denser particles migrate outward and collect at the tube wall or bottom. Relative centrifugal force quantifies that field: $RCF = 1.118 \times 10^{-5} \times r \times N^2$, where r is rotor radius in millimeters and N is speed in rpm. Speed enters the equation squared, so the microtube rotor at 19,000 rpm produces 25,100 x g.

Rotor geometry sets the trade between speed and volume. Angle rotors fix tubes at a pitch, keeping mass close to the axis so the rotor tolerates high rotational stress, and the short sedimentation path packs a pellet against the tube wall. Swing rotors pivot buckets horizontal under load, giving particles the full tube length to travel and leaving a flat pellet with a clean supernatant boundary. That geometry places mass farther out, so the 250 mL swing rotor tops out near 3,917 x g.

Ramp control decides whether a separation holds. Rapid braking drags fluid across a settled pellet and can resuspend it or re-emulsify a separated phase, so the eleven acceleration and twelve deceleration profiles let operators match the ramp to the sample. Five-step programming chains different speeds and durations into one method, which suits washes and staged clarifications. Rotational drag against chamber air also wastes energy and generates heat, and the oval bucket profile reduces that drag.

TECHNICAL SPECIFICATIONS

Multipurpose High Speed Centrifuge (4 x 250 mL) - ToronCent™ HS MP Technical Specifications

Parameter	Specification
Maximum Speed	19,000 rpm
Maximum RCF	25,100 x g
Maximum Capacity	4 x 250 mL
Speed Accuracy	±20 rpm
Timer Range	1 s to 99 min 59 s, or 1 min to 99 h 59 min
Timing Modes	Start timing at set speed, start timing when spinning, short spin timing
Rotor Identification	Automatic
Display	7-inch HD touchscreen, glove-compatible
Program Memory	Multiple stored programs, five-step centrifugation supported
Acceleration Profiles	11
Deceleration Profiles	12
Fastest Acceleration	10 s
Lid Locking	Automated
Noise Level	≤65 dB(A)
Voltage	AC 220 V ±22 V, 50/60 Hz (110V is also available)
Power Consumption	650 W

Parameter	Specification
Dimensions (W x D x H)	436 x 560 x 380 mm
Packing Dimensions (W x D x H)	547 x 727 x 432 mm
Net Weight	48 kg

Angle Rotor Options

Max Capacity	Max Speed	Max RCF	Adapters Available
12 x 1.5 / 2.2 mL	19,000 rpm	25,100 x g	0.2 mL, 0.5 mL
24 x 1.5 / 2.2 mL	15,500 rpm	22,991 x g	0.2 mL, 0.5 mL
30 x 1.5 / 2.2 mL	13,000 rpm	19,090 x g	0.2 mL, 0.5 mL
48 x 1.5 / 2.2 mL	13,000 rpm	18,525 x g	0.2 mL, 0.5 mL
12 x 15 mL (conical)	12,000 rpm	16,098 x g	5 mL
6 x 50 mL	12,000 rpm	15,285 x g	1.5, 5, 10, 15, 20, 25, 30 mL
6 x 50 mL (conical)	11,000 rpm	12,843 x g	15 mL (conical)
4 x 100 mL	11,000 rpm	13,000 x g	5, 10, 15 mL (round/conical); 25, 50 mL (round/conical)
6 x 85 mL	11,000 rpm	13,280 x g	5, 10, 15 mL (round/conical); 25, 50 mL (round/conical)
40 x 15 mL	5,000 rpm	4,053 x g	

Swing Rotor Options

Max Capacity	Max Speed	Max RCF	Bucket Type

60 x 1.5 mL	14,000 rpm	16,400 x g	Integral carrier
4 x 250 mL	4,200 rpm	3,450 x g	Oval bucket
4 x 250 mL	4,500 rpm	3,917 x g	Rectangular bucket
4 x 100 mL	4,500 rpm	3,056 x g	Round bucket
2 x 2 x 96-well	4,500 rpm	2,784 x g	Microplate bucket

Bucket and Adapter Configurations

Bucket Type	Adapter Configurations
Oval bucket, 4 x 250 mL swing rotor	4 x 26 x 1.5 mL; 4 x 10 x 5 mL; 4 x 14 x 5/7 mL; 4 x 13 x 10 mL; 4 x 8 x 15 mL (conical); 4 x 8 x 15 mL; 4 x 6 x 20 mL; 4 x 4 x 50 mL (conical); 4 x 4 x 50 mL; 4 x 2 x 100 mL; 4 x 1 x 250 mL
Rectangular bucket, 4 x 250 mL swing rotor	4 x 16 x 1.5 mL; 4 x 17 x 5/7 mL; 4 x 12 x 10 mL; 4 x 9 x 15 mL (conical); 4 x 4 x 50 mL (conical); 4 x 1 x 100 mL; 4 x 1 x 250 mL
Round bucket, 4 x 100 mL swing rotor	4 x 3 x 10 mL blood collection tube; 4 x 1 x 15 mL; 4 x 1 x 15 mL (conical); 4 x 1 x 50 mL; 4 x 1 x 50 mL (conical)
Microplate bucket	2 x 6 x 96 ELISA microplate; 2 x 2 x 96 deep-well plate; 2 x 1 x 96 filter plate reagent kit
Custom configurations	Available on request

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