



BENCHTOP HIGH SPEED REFRIGERATED CENTRIFUGE (4 X 250 ML)

Benchtop High Speed Refrigerated Centrifuge (4 x 250 mL) - ToronCent™ HSR B

ToronCent HSR B benchtop high speed refrigerated centrifuge accepts sample formats from 0.2 mL PCR tubes to 250 mL bottles, along with ELISA plates, deep-well plates, and filter plates. Sixteen rotors mount on one drive: twelve fixed-angle and four horizontal. Speed reaches 19,000 rpm and relative centrifugal force reaches 31,006 x g. The chamber holds any setpoint from -20°C to 40°C within $\pm 1^\circ\text{C}$.

Those headline figures come from different rotors, as they do on any multi-rotor platform. The 24 x 1.5/2.0 mL angle rotor produces the 31,006 x g maximum at 18,000 rpm, while the 12 x 1.5/2.2 mL rotor turns fastest at 19,000 rpm and 25,100 x g. The 4 x 250 mL horizontal rotor runs at 4,500 rpm and 3,917 x g with rectangular buckets. Matching rotor to protocol therefore comes before matching instrument to protocol.

Operators type target values directly for speed, RCF, time, and ramp rate rather than dialing them in, which removes a rounding step and shortens setup. A 7-inch touchscreen shows setpoints and live conditions together. The instrument stores months of run data and fault records on board, retrievable at the screen without a computer. Self-diagnostics watch the door interlock, motor temperature, rotational speed, and internal communications, and the lid locks automatically once a run begins.

APPLICATIONS

Benchtop High Speed Refrigerated Centrifuge (4 x 250 mL) - ToronCent™ HSR B Applications

Format range drives the fit here. Laboratories that move between plates, microtubes, conical tubes, and bottles get all four on one deck.

- **Immunoassay and ELISA Laboratories:** spins ELISA plates, filter plates, and reagent kits in the dedicated microplate rotor at up to 2,784 x g
- **Molecular Biology and PCR Workflows:** handles 0.2 mL PCR tubes through 2.2 mL microtubes, with 30-place, 48-place, and 60-place rotors for batch throughput
- **Cell Culture and Cell Biology:** pellets mammalian and bacterial cells in 15 mL and 50 mL conical tubes, then scales to 100 mL or 250 mL bottles for larger harvests
- **Clinical Diagnostics and Blood Work:** prepares serum and plasma using blood collection tube adapters in the horizontal rotors
- **Genomics and Nucleic Acid Extraction:** clears lysates and pellets precipitates at up to 31,006 x g on the high speed angle rotors
- **Protein Chemistry and Enzymology:** collects precipitated protein and removes debris while the chamber holds near 4°C
- **Deep-Well Plate Sample Preparation:** processes 96-well deep-well plates ahead of automated liquid handling
- **Pharmaceutical and Biotechnology Quality Control:** clarifies in-process and release samples under controlled temperature
- **Academic and Shared Research Facilities:** sixteen rotors and stored programs let one instrument serve groups working in unlike sample formats



Standards

No international test standards appear in the supplier's technical documentation for this model, and torontech publishes only what the manufacturer supports. Request the declaration of conformity and the factory calibration record when ordering, and plan to qualify the unit under the laboratory's own equipment verification procedure before putting it into regulated service.

FEATURES

Benchtop High Speed Refrigerated Centrifuge (4 x 250 mL) - ToronCent™ HSR B Key Features

The control system and the rotor catalog carry the value on this model: direct numeric entry instead of knobs, and a format range that runs from PCR tubes to quarter-liter bottles.

- **Sixteen Rotor Options:** twelve fixed-angle rotors and four horizontal rotors cover 0.2 mL tubes through 250 mL bottles, plus ELISA, deep-well, and filter plates
- **Direct Numeric Entry:** speed, RCF, time, and both ramp rates are typed as target values rather than dialed in, which removes the rounding error inherent to knob controls
- **7-Inch HD Touchscreen:** setpoints and live run conditions appear together, so operators read actual speed, temperature, and remaining time without switching views
- **Five-Step Centrifugation Programs:** a single stored method runs up to five sequential speed and time stages, which suits density gradient and multi-phase protocols
- **Ten Acceleration and Eleven Deceleration Profiles:** fine ramp selection prevents secondary emulsification and keeps soft pellets seated through braking
- **Extended Onboard Data Storage:** months of operation records and fault logs stay on the instrument and are reviewable at the screen without a connected computer

- **Automated Lid Locking:** the lid secures itself once a run starts and releases only when the rotor has stopped
- **Automatic Rotor Identification:** the drive reads the installed rotor and enforces that rotor's individual speed rating as over-speed protection
- **Multi-Point Self-Diagnostics:** monitored faults include door interlock failure, over-speed condition, motor overheating, operator error, and communication loss
- **Stored Program Recall:** saved methods load in one step, which keeps technique consistent across operators and shifts
- **Dedicated Microplate Rotor:** a horizontal plate rotor takes 2 x 6 ELISA plates, 2 x 2 deep-well plates, or 2 x 1 filter plate reagent kits
- **Environment-Friendly Refrigerant:** a high performance compressor circuit holds the chamber from -20°C to 40°C within $\pm 1^\circ\text{C}$
- **Low Acoustic Output:** noise stays at or below 65 dB(A), suited to shared benches and open laboratory layouts

THEORY & METHOD

Theory and Method

Plate-based separation demands a horizontal rotor. A microplate has to remain level while the force acts along the well axis, so buckets that swing to horizontal during the spin drive precipitate to the well bottom rather than one side. Fixed-angle geometry would push the pellet against the well wall and compromise the read. That constraint explains why the ELISA, deep-well, and filter plate configurations all attach to the horizontal rotor rather than any of the twelve angle rotors.

Comparing rotors on speed alone misleads, since a run's duration depends on how far a particle must travel and how strong the field is along that path. Sedimentation follows $\text{RCF} = 1.118 \times 10^{-5} \times r \times N^2$, where r is the radius in centimeters and N the speed in rpm. A short-radius microtube rotor at 19,000 rpm and a long-radius bottle rotor at 12,000 rpm can deliver similar force while clearing at different rates. Published methods state $\times g$ for that reason.

Five-step programming lets one method chain separate speed, time, and ramp stages without operator intervention. Density gradient work uses this directly: a slow initial stage forms the layers, a sustained high-force stage resolves the bands, and the gentlest deceleration profile brings the rotor down without remixing them. Ten acceleration and eleven deceleration profiles set the ramp on each stage. Refrigeration counters the heat that rotor drag generates at speed, keeping enzymes, viable cells, and labile analytes at the temperature the protocol calls for.

TECHNICAL SPECIFICATIONS

Benchtop High Speed Refrigerated Centrifuge (4 x 250 mL) - ToronCent™
HSR B Technical Specifications

Parameter	Specification
Order Number	0202223000
Maximum Speed	19,000 rpm
Maximum RCF	31,006 x g
Maximum Capacity	4 x 250 mL
Speed Accuracy	±10 rpm
Time Setting Range	1 min to 99 h 59 min
Temperature Setting Range	-20°C to 40°C
Temperature Accuracy	±1°C
Refrigeration Unit	High performance compressor, environment-friendly refrigerant
Display	7-inch HD touchscreen

Parameter	Specification
Acceleration / Deceleration Profiles	10 / 11
Program Steps	Up to 5 per method
Rotor Identification	Automatic
Lid Locking	Automatic
Noise Level	≤65 dB(A)
Voltage	AC 220 V ±22 V, 50 Hz (110V is also available)
Power Consumption	1,500 W
Dimensions (W x D x H)	710 x 560 x 450 mm (28.0 x 22.0 x 17.7 in)
Packing Dimensions (W x D x H)	1,022 x 712 x 630 mm (40.2 x 28.0 x 24.8 in)
Net Weight	95 kg (209 lb)

Fixed-Angle Rotors

Maximum speed and maximum RCF apply to each rotor individually, not to the instrument as a whole.

Rotor	Order Number	Capacity	Max Speed	Max RCF	Adapters
No. 1	0301805020	12 x 1.5/2.2 mL	19,000 rpm	25,100 x g	0.2 mL, 0.5 mL
No. 2	0301891142	12 x 15 mL (conical)	14,000 rpm	21,912 x g	5 mL
No. 3	0301805310	12 x 10 mL	16,000 rpm	26,310 x g	1.5 mL, 5 mL
No. 4	0301805420	6 x 50 mL	13,000 rpm	17,938 x g	1.5, 5, 10, 15, 20, 25, 30 mL
No. 5	0301805930	6 x 50 mL (conical)	12,500 rpm	16,585 x g	15 mL conical; 50 mL round-bottom adapter included

Rotor	Order Number	Capacity	Max Speed	Max RCF	Adapters
No. 6	0301805710	4 x 100 mL	12,000 rpm	15,471 x g	5, 10, 25 mL; 15 mL and 50 mL (round/conical)
No. 7	0301812510	30 x 1.5/2.0 mL	16,000 rpm	28,917 x g	0.2 mL, 0.5 mL
No. 8	0301812830	48 x 1.5/2.0 mL	16,000 rpm	28,061 x g	0.2 mL, 0.5 mL
No. 9	0301891097	6 x 85 mL	12,000 rpm	15,805 x g	5, 10, 25 mL; 15 mL and 50 mL (round/conical)
No. 10	0301891144	40 x 15 mL	5,500 rpm	4,904 x g	—
No. 15	0301855600	60 x 1.5 mL	15,000 rpm	18,826 x g	—
No. 16	0301805520	24 x 1.5/2.0 mL	18,000 rpm	31,006 x g	0.2 mL, 0.5 mL

Horizontal (Swing) Rotors

Rotor	Order Number	Capacity	Max Speed	Max RCF	Bucket
No. 11	0302891099	4 x 250 mL	4,200 rpm	3,450 x g	Oval bucket, 0303891081
No. 12	0302891099	4 x 250 mL	4,500 rpm	3,917 x g	Rectangular bucket, 0303891082
No. 13	0302891038	4 x 100 mL	5,000 rpm	3,773 x g	Round bucket, 0303891029
No. 14	0302852310	2 x 2 x 96 well	4,500 rpm	2,784 x g	Microplate bucket, 0303852351

Rotors No. 11 and No. 12 share the same rotor body; bucket choice sets the speed and force rating.

Adapters: Rotor No. 11 (Oval Bucket)

Adapter Configuration	Order Number
4 x 26 x 1.5 mL	0304891454

Adapter Configuration	Order Number
4 x 10 x 5 mL	0304891456
4 x 14 x 5/7 mL	0304891459
4 x 13 x 10 mL	0304891461
4 x 9 x 15 mL (conical)	0304891463
4 x 9 x 15 mL	0304891465
4 x 6 x 20 mL	0304891467
4 x 4 x 50 mL (conical)	0304891469
4 x 4 x 50 mL	0304891471
4 x 2 x 100 mL	0304891473
4 x 1 x 250 mL	0304891475

Custom adapter configurations are available on request.

Adapters: Rotor No. 12 (Rectangular Bucket)

Adapter Configuration	Order Number
4 x 16 x 1.5 mL	0304891477
4 x 17 x 5/7 mL	0304891479
4 x 12 x 10 mL	0304891481
4 x 9 x 15 mL (conical)	0304891483
4 x 4 x 50 mL (conical)	0304891485

Adapter Configuration	Order Number
4 x 1 x 100 mL	0304891487
4 x 1 x 250 mL	0304891489

Adapters: Rotor No. 13 (4 x 100 mL Round Bucket)

Adapter Configuration	Order Number
4 x 3 x 10 mL blood collection tube	0304852409
4 x 1 x 15 mL	0304891119
4 x 1 x 15 mL (conical)	0304891118
4 x 1 x 50 mL	0304891116
4 x 1 x 50 mL (conical)	0304891114

Plate Configurations: Rotor No. 14 (Microplate Bucket)

Configuration	Plate Capacity
2 x 6 ELISA microplate	2 x 6 x 96
2 x 2 deep-well plate	2 x 2 x 96
2 x 1 filter plate reagent kit	2 x 1 x 96

Custom plate configurations are available on request.



Torontech Inc.

251 Consumers Road, Suite 1200
Toronto, Ontario, M2J 4R3, Canada 

Phone: +1 416 368 2721 | Fax: +1 416 981 7652
Email: info@torontech.com

Torontech, LLC

601 Brickell Key Drive, Suite 700
Miami, FL 33131, USA 

Toll-Free: 1-866-383-7919
Email: sales@torontech.com

Torontech ME FZE

Meydan Grandstand, 6th Floor,
Meydan Road, Nad Al Sheba,
Dubai-261440, UAE 

Phone: +971 488 19252
Email: me@torontech.com

