

LARGE CAPACITY HIGH SPEED REFRIGERATED CENTRIFUGE (4 X 750 ML)



Large Capacity High Speed Refrigerated Centrifuge (4 x 750 mL) - ToronCent™ HSR LC

ToronCent HSR LC large capacity refrigerated centrifuge processes up to 3 liters per run in four 750 mL buckets while holding the chamber from -20°C to 40°C. Blood banks, cell culture facilities, and process development labs use it to harvest cells, wash media, and separate blood components in volumes that microtube instruments cannot reach. A variable frequency drive turns angle rotors as fast as 21,000 rpm for small-volume work on the same deck. The benchtop chassis measures 713 x 681 x 398 mm.

Fourteen rotor options span the range, and the choice sets the real ceiling for any given protocol. The 4 x 750 mL swing rotor turns at 4,000 rpm and 3,500 x g, which suits blood component work and cell harvesting. Angle rotors deliver the high end: the 24 x 1.5/2.2 mL rotor reaches 32,752 x g, and the 12 x 1.5/2.2 mL rotor hits the full 21,000 rpm. Maximum speed and maximum capacity therefore belong to different rotors, not to a single configuration.

Temperature control uses a variable frequency compressor under PID regulation with a dual-channel refrigeration circuit, holding 4°C within $\pm 0.5^\circ\text{C}$ even at maximum speed. Pre-cooling runs on a schedule and adapts to the rotor in place, so the chamber sits at setpoint when the first sample arrives. Aerosol-tight round and rectangular buckets contain the sample during spins of infectious or hazardous material. Rotor identification, automatic run logging, and 100 named programs round out the control package for regulated laboratories.

APPLICATIONS

Large Capacity High Speed Refrigerated Centrifuge (4 x 750 mL) - ToronCent™ HSR LC Applications

The ToronCent HSR LC covers the volume range where clinical, biotechnology, and process laboratories move from tube-scale preparation to bulk separation.

- **Blood Banking and Transfusion Services:** separates whole blood into packed cells, plasma, and platelet fractions using the 4 x 750 mL swing rotor and dedicated blood collection tube adapters
- **Clinical Diagnostics:** prepares serum and plasma in batches of up to 152 vacuum collection tubes per run across four rectangular buckets
- **Cell Culture and Bioprocess Development:** harvests bacterial, yeast, and mammalian cultures from shake flasks and bioreactor draws without splitting the volume across multiple spins
- **Molecular Biology and Nucleic Acid Preparation:** pellets DNA and RNA precipitates and clears lysates on high speed angle rotors above 30,000 x g
- **Protein Purification and Enzymology:** collects precipitated protein and removes cell debris while the chamber holds 4°C to preserve activity
- **Microbiology and Vaccine Research:** concentrates bacterial cultures and viral preparations inside aerosol-tight buckets rated for biosafety handling
- **Pharmaceutical Quality Control:** clarifies formulation batches and supports stability programs that call for controlled-temperature separation
- **High-Throughput Screening Laboratories:** spins deep-well plates and standard microplates with the dedicated microplate bucket
- **Environmental and Water Analysis:** settles suspended solids from large-volume field samples ahead of instrumental analysis



 TORONTECH

ToronCent™ HSR LC
Large Capacity High Speed
Refrigerated Centrifuge
(4 x 750 mL)

Standards

torontech supplies the ToronCent HSR LC with the manufacturer's conformity documentation and calibration records. Supplier literature for this model does not cite specific international test standards, so laboratories operating under accredited quality programs should request the declaration of conformity at the time of order and qualify the unit under their own equipment verification procedure.

FEATURES

Large Capacity High Speed Refrigerated Centrifuge (4 x 750 mL) - ToronCent™ HSR LC Key Features

The design addresses the three problems that surface most often in high-volume separation work: temperature drift at speed, method repeatability across operators, and containment of hazardous samples.

- **Variable Frequency Compressor with PID Control:** compressor output modulates continuously instead of cycling on and off, which holds 4°C to within $\pm 0.5^\circ\text{C}$ even at maximum rotational speed
- **Dual-Channel Refrigeration Circuit:** two independent cooling paths keep temperature-sensitive samples at setpoint through the full acceleration and braking cycle
- **Scheduled Pre-Cooling:** pre-cooling parameters adjust to the installed rotor and start on a timer, so the chamber is at temperature when the analyst walks in
- **AC Variable Frequency Motor:** a brushless drive removes carbon dust from the chamber, eliminates brush replacement, and holds speed to better than 10 rpm
- **Aerosol-Tight Buckets:** sealed round and rectangular buckets contain the sample during spins of infectious or otherwise hazardous material
- **100 Named Program Groups:** stored and labeled methods recall in one step, which standardizes technique across shifts and simplifies audit review

- **Eleven Acceleration and Twelve Deceleration Rates:** fine ramp control keeps soft pellets and density layers intact through the braking phase
- **7-Inch HD Touchscreen:** setup values and live run parameters appear on one screen, and operators type target values directly rather than stepping through menus
- **Automatic Run and Diagnostic Logging:** the instrument records every cycle and every fault without operator action, giving QC teams a retrievable history per batch
- **User-Defined Sleep Mode:** the unit idles between experiments on a schedule the lab sets, which cuts energy use and reduces compressor wear
- **Rotor Identification:** the drive recognizes the installed rotor and limits speed to that rotor's rating before the run starts
- **Short Spin Function:** a momentary spin collects droplets from tube walls without programming a full cycle
- **Fourteen Rotor Options:** angle rotors from 48 x 1.5/2.2 mL through 6 x 100 mL, plus 4 x 500 mL and 4 x 750 mL swing rotors and a dedicated microplate bucket
- **Low Acoustic Output:** noise stays at or below 65 dB(A), which suits shared benches and open laboratory layouts

THEORY & METHOD

Theory and Method

Sedimentation under centrifugal force separates particles by size and density difference. Angular velocity sets the field strength, and rotor radius scales it, so relative centrifugal force follows $RCF = 1.118 \times 10^{-5} \times r \times N^2$ with r in centimeters and N in rpm. Large-volume rotors carry heavy loads at long radius, which raises rotor stress as the square of speed and caps how fast they can safely turn. Rotor mechanics, not motor power, cap the 4 x 750 mL swing rotor at 4,000 rpm.

Swinging buckets pivot outward as the rotor spins, aligning the tube axis with the force vector. Particles travel straight down the full tube length and form a flat pellet at the bottom, which makes decanting straightforward and keeps layered separations sharp. Fixed-angle rotors hold tubes at a constant tilt, so particles strike the outer wall first and slide down to a

compact pellet. Shorter path length means faster clearing at equal force, which is why the small-volume angle rotors finish a spin in less time.

Aerodynamic drag on the rotor converts mechanical energy into heat, and the load climbs steeply with speed. A fixed-output compressor overshoots at low speed and falls behind at high speed, which is where variable frequency control earns its place. The ToronCent HSR LC modulates compressor output continuously against a PID loop, so the chamber tracks setpoint through acceleration, steady state, and braking. Sample temperature stays at 4°C within ±0.5°C even during a maximum-speed run, which protects enzymes, viable cells, and labile blood fractions.

TECHNICAL SPECIFICATIONS

Large Capacity High Speed Refrigerated Centrifuge (4 x 750 mL) - ToronCent™ HSR LC Technical Specifications

Parameter	Specification
Order Number	0202253006
Maximum Speed	21,000 rpm
Maximum RCF	32,752 x g
Maximum Capacity	4 x 750 mL
Speed Accuracy	±10 rpm
Time Setting Range	1 s to 99 min 59 s; 1 min to 99 h 59 min
Timing Modes	Start timing, speed timing, continuous timing
Temperature Setting Range	-20°C to 40°C

Parameter	Specification
Temperature Accuracy	4°C ±0.5°C at maximum speed
Pre-Cooling Function	Yes, rotor-specific and schedulable
Refrigeration Unit	Variable frequency compressor, R134a refrigerant
Drive Motor	AC variable frequency, brushless
Display	7-inch HD touchscreen
Program Storage	100 user-defined program groups
Acceleration / Deceleration Rates	11 / 12
Rotor Identification	Yes
Short Spinning	Yes
Noise Level	≤65 dB(A)
Voltage	AC 220 V ±22 V, 50/60 Hz (110V is also available)
Power Consumption	1.6 kW
Dimensions (W x D x H)	713 x 681 x 398 mm (28.1 x 26.8 x 15.7 in)
Packing Dimensions (W x D x H)	860 x 810 x 620 mm (33.9 x 31.9 x 24.4 in)
Net Weight	95 kg (209 lb)

Available Rotors

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

Rotor	Order Number	Type	Capacity	Max Speed	Max RCF	Adapters
-------	--------------	------	----------	-----------	---------	----------

No. 1	0301805020	Fixed angle	12 x 1.5/2.2 mL	21,000 rpm	30,642 x g	0.2 mL, 0.5 mL
No. 2	0301891142	Fixed angle	12 x 15 mL (conical)	14,000 rpm	21,913 x g	5 mL conical
No. 3	0301805310	Fixed angle	12 x 10 mL	15,000 rpm	23,120 x g	1.5 mL, 5 mL
No. 3A	0301891095	Fixed angle	6 x 30 mL	15,000 rpm	23,120 x g	5 mL, 10 mL
No. 4	0301805420	Fixed angle	6 x 50 mL	13,500 rpm	19,354 x g	1.5, 5, 10, 15, 20, 25, 30 mL
No. 5	0301805930	Fixed angle	6 x 50 mL (conical)	13,000 rpm	17,947 x g	15 mL conical; 50 mL round-bottom adapter included
No. 6	0301891235	Fixed angle	12 x 5 mL	16,500 rpm	19,166 x g	0.5 mL, 1.5 mL
No. 7	0301812510	Fixed angle	30 x 1.5/2.2 mL	16,000 rpm	28,918 x g	0.2 mL, 0.5 mL
No. 8	0301812830	Fixed angle	48 x 1.5/2.2 mL	15,000 rpm	24,663 x g	0.2 mL, 0.5 mL
No. 9	0301891099	Fixed angle	6 x 100 mL	10,000 rpm	11,960 x g	5, 10, 25 mL; 15 mL and 50 mL (conical/round)
No. 10	0301891236	Fixed angle	24 x 1.5/2.2 mL	18,500 rpm	32,752 x g	0.2 mL, 0.5 mL
No. 11	0301891237	Fixed angle	8 x 50 mL (conical)	11,000 rpm	14,100 x g	1.5, 5, 10, 15, 20, 25, 30 mL; 50 mL round-bottom adapter included
No. 12	0302850110	Swing	4 x 500 mL	4,000 rpm	3,345 x g	See bucket tables (buckets sold separately)
No. 13	0302891036	Swing	4 x 750 mL	4,000 rpm	3,500 x g	See bucket tables (buckets sold separately)
No. 14	0301891253	Fixed angle	8 x 50 mL	12,000 rpm	15,615 x g	1.5, 5, 10, 15, 20, 25, 30 mL

Buckets and Adapters: Rotor No. 12 (4 x 500 mL Swing)

Bucket	Order Number
Round bucket	0303891022
Aerosol-tight round bucket	0303891077

Bucket	Order Number
Rectangular bucket	0303851421
Rectangular bucket with sealing cover	0303891016

Bucket Type	Adapter Configuration	Order Number
Round	4 x 1 x 250 mL	0304891142
Round	4 x 2 x 100 mL	0304891009
Round	4 x 4 x 50 mL (conical/round)	0304891008
Round	4 x 7 x 20 mL	0304851485
Round	4 x 9 x 15 mL (conical/round)	0304891083
Round	4 x 11 x 15 mL conical (cap ≤21.5 mm)	0304891508
Round	4 x 14 x 10 mL	0304891705
Round	4 x 19 x 5/7 mL vacuum blood collection tube	0304851450
Round	4 x 36 x 1.5 mL	0304891677
Rectangular	4 x 1 x 250 mL	0304891041
Rectangular	4 x 3 x 100 mL	0304891744
Rectangular	4 x 6 x 50 mL (conical/round)	0304891014
Rectangular	4 x 12 x 15 mL conical	0304891582
Rectangular	4 x 12 x 15 mL round	0304891779
Rectangular	4 x 20 x 10 mL	0304891077
Rectangular	4 x 31 x 5/7 mL vacuum blood collection tube	0304891782

Bucket Type	Adapter Configuration	Order Number
Rectangular	4 x 56 x 1.5 mL	0304891603

Custom adapter configurations are available on request.

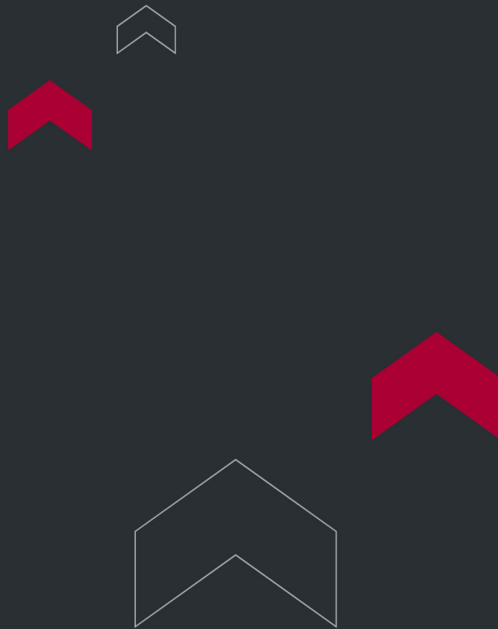
Buckets and Adapters: Rotor No. 13 (4 x 750 mL Swing)

Bucket	Order Number
Round bucket	0303891025
Aerosol-tight round bucket	0303891006
Rectangular bucket	0303891002
Microplate bucket	0303891147

Bucket Type	Adapter Configuration	Order Number
Round	4 x 1 x 500 mL conical	0304891035
Round	4 x 1 x 500 mL flat	0304891036
Round	4 x 1 x 250 mL conical	0304891562
Round	4 x 1 x 250 mL flat	0304891039
Round	4 x 4 x 100 mL	0304891006
Round	4 x 5 x 50 mL (self-standing tube)	0304891024
Round	4 x 7 x 50 mL conical	0304891003
Round	4 x 7 x 50 mL round	0304891004
Round	4 x 10 x 20 mL	0304891163

Bucket Type	Adapter Configuration	Order Number
Round	4 x 15 x 15 mL conical	0304891005
Round	4 x 19 x 10 mL (self-standing tube)	0304891732
Round	4 x 21 x 10 mL	0304891730
Round	4 x 27 x 5/7 mL vacuum blood collection tube	0304891728
Round	4 x 37 x 5 mL (RIA tube)	0304891166
Round	4 x 56 x 1.5 mL	0304891025
Rectangular	4 x 9 x 50 mL conical	0304891015
Rectangular	4 x 9 x 50 mL round	0304891016
Rectangular	4 x 19 x 15 mL conical	0304891012
Rectangular	4 x 19 x 15 mL round	0304891704
Rectangular	4 x 30 x 10 mL	0304891709
Rectangular	4 x 38 x 5/7 mL vacuum blood collection tube	0304891017
Microplate	4 x 2 x 96 deep-well plate	Contact torontech
Microplate	4 x 4 x 96 microplate	Contact torontech

Total stacked plate height in the microplate bucket must not exceed 67 mm.



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

