

## LARGE CAPACITY LOW SPEED CENTRIFUGE (4 X 750 ML)



## Large Capacity Low Speed Centrifuge (4 x 750 mL) - ToronCent™ LS LC

ToronCent™ LS LC large capacity low speed centrifuge processes up to 4 x 750 mL per run and reaches 5,500 rpm and 4,904 x g. Clinical laboratories, blood banks, cell culture facilities, and molecular biology groups use it for high volume separations that exceed the capacity of standard benchtop units. Two configurations share the same drive and control platform: a refrigerated model covering -20°C to 40°C, and an ambient model for room temperature work. Rotor identification and short spin come standard on both.

Four rotors cover the working range. A 40 x 15 mL angle rotor delivers the top speed and g-force for pelleting. Three swing rotors run at 4,000 rpm and hold 4 x 500 mL, 4 x 750 mL, or 120 blood collection tubes with automatic de-capping. Round and rectangular buckets accept adapters covering 0.5 mL microtubes up to 500 mL bottles, and a microplate bucket takes deep-well plates. Aerosol-tight buckets and autoclavable adapters support work with infectious material.

A 7-inch touchscreen drives setup and reads clearly through gloves. Operators store up to 100 programs, each divisible into five steps with independent speed and time. Eleven acceleration and twelve deceleration profiles protect gradients and loose pellets. The refrigerated model adds scheduled pre-cooling and an airflow guiding chamber design that holds sample temperature during long runs.

### APPLICATIONS

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## Large Capacity Low Speed Centrifuge (4 x 750 mL) - ToronCent™ LS LC Applications

The ToronCent™ LS LC suits laboratories that separate large sample volumes or run high tube counts in a single batch.

- **Clinical Diagnostics and Hospital Laboratories:** batch processing of vacuum blood collection tubes for serum and plasma separation, with up to 152 tubes loaded per run
- **Blood Component Preparation:** separation of plasma, buffy coat, and packed cells in 250 mL and 500 mL containers using swing-out buckets that keep layers flat and easy to decant
- **Cell Culture and Bioprocessing:** harvesting mammalian and bacterial cells in 750 mL bottles, replacing repeated small volume spins with one cycle
- **Molecular Biology:** recovery of nucleic acid precipitates and washed pellets across 15 mL and 50 mL conical tubes
- **Microbiology and Virology:** concentration of cultures and infectious samples inside aerosol-tight, autoclavable buckets
- **Pharmaceutical Quality Control:** clarification of formulations and dissolution samples ahead of analytical testing
- **Microplate and High Throughput Workflows:** spin-down of 96-well and deep-well plates for assay preparation and bead-based protocols
- **Immunoassay and Radioimmunoassay:** dedicated 5 mL RIA tube adapters for batch handling of assay tubes
- **Food, Beverage, and Environmental Testing:** sediment recovery and clarification of large volume aqueous samples



**ToronCent™ LS LC**  
Large Capacity Low Speed Centrifuge  
(4 x 750 mL)

# Standards

The source documentation for the ToronCent™ LS LC references no test method or safety standard, so this page makes no compliance claim. The rotor identification system, the sealed aerosol-tight buckets, and the automatic diagnostic logging function as safety design features rather than certified conformity to a published standard. Buyers who require documented conformity for laboratory centrifuge safety, electromagnetic compatibility, or regional market access should request the supporting certificates before placing an order. Torontech provides available documentation on request.

## FEATURES

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### Large Capacity Low Speed Centrifuge (4 x 750 mL) - ToronCent™ LS LC

#### Key Features

The control platform, rotor range, and refrigeration package target laboratories running long batches and mixed sample formats.

- **7-Inch Full Touchscreen:** responds through gloves and shows every run parameter on one screen, cutting setup time against push-button panels
- **4 x 750 mL Maximum Capacity:** handles 3 L per cycle, which collapses several runs on a standard benchtop unit into one
- **Wide Adapter Range:** covers 0.5 mL microtubes up to 750 mL bottles, including conical, round, self-standing, RIA, and vacuum blood collection tubes
- **RCF and Speed Toggle:** switches between rpm and x g with a single touch, so protocols written either way run without hand conversion
- **100 Stored Programs:** saves routine methods for repeat recall, with five independent steps per program each carrying its own speed and time

- **Eleven Acceleration and Twelve Deceleration Profiles:** match ramp rates to sample fragility, and a settable free parking time lets the rotor coast down without braking loose pellets
- **Dual Time Ranges and Three Timing Modes:** cover 1 s to 99 min 59 s and 1 min to 99 h 59 min, with start timing, at-speed timing, or continuous running
- **AC Frequency Conversion Motor:** runs brushless with no carbon dust, needs no routine maintenance, and holds speed within  $\pm 10$  rpm
- **Rotor Identification:** reads the installed rotor and applies its speed limit automatically, preventing over-speed of the lower rated swing rotors
- **Aerosol-Tight Buckets:** seal the sample during spinning for work with infectious or hazardous material
- **Autoclavable Buckets and Adapters:** allow steam sterilization between sample types without replacing consumables
- **Automatic De-Capping Swing Rotor:** opens 120 blood collection tubes at 13 x 75 mm or 13 x 100 mm in a single load for high throughput clinical batches
- **Short Spin Function:** delivers quick manual pulses for tube contents that need collecting rather than separating
- **Automatic Run and Diagnostic Logging:** stores operating records so the laboratory can trace each batch and review instrument behavior
- **Scheduled Pre-Cooling (refrigerated model):** chills the chamber ahead of the session using rotor-specific parameters, so the first run starts on time
- **Variable Frequency Compressor with PID Control (refrigerated model):** pairs with a dual channel refrigeration circuit to hold  $\pm 0.5^{\circ}\text{C}$  across the full temperature range
- **Airflow Guiding Chamber (refrigerated model):** directs cold air around the rotor to keep temperature sensitive samples at set point through long runs
- **Programmable Sleep Mode (refrigerated model):** idles the compressor after a set interval, 15 minutes by default, saving energy and extending compressor life
- **R134a Refrigerant (refrigerated model):** a hydrofluorocarbon with zero ozone depletion potential, serviceable by standard refrigeration technicians

# Theory and Method

Centrifugal separation replaces gravity with a much larger radial acceleration. Relative centrifugal force follows  $RCF = 1.118 \times 10^{-5} \times r \times N^2$ , where  $r$  is the rotating radius in centimeters and  $N$  is speed in revolutions per minute. Sedimentation rate scales with particle size, the density difference between particle and medium, and the inverse of medium viscosity, the relationship Stokes' law describes. Larger and denser particles reach the tube bottom first, which separates cells from plasma or harvested biomass from spent medium.

Low speed instruments trade rotational speed for radius and volume. The 4 x 750 mL swing rotor turns at 4,000 rpm yet reaches 3,500 x g because its radius compensates. Swing buckets pivot horizontal under load, so sediment travels along the tube axis and the pellet forms flat at the bottom. That geometry suits soft pellets, buffy coat layers, and hand decanting. The 40 x 15 mL angle rotor holds tubes at a fixed angle, shortens the sedimentation path, and reaches 4,904 x g.

Friction between the rotor and the chamber air heats the sample during long runs, and heat degrades enzymes, live cells, and labile proteins. The refrigerated model answers this with a variable frequency compressor under PID control and a dual channel refrigeration circuit that holds set point within  $\pm 0.5^{\circ}\text{C}$  across  $-20^{\circ}\text{C}$  to  $40^{\circ}\text{C}$ . An airflow guiding design directs cold air around the rotor rather than letting it settle in the chamber floor. Scheduled pre-cooling brings the chamber to temperature before the session starts.

## TECHNICAL SPECIFICATIONS

### Large Capacity Low Speed Centrifuge (4 x 750 mL) - ToronCent™ LS LC Technical Specifications

| Parameter | ToronCent™ LS LC-R (Refrigerated) | ToronCent™ LS LC (Ambient) |
|-----------|-----------------------------------|----------------------------|
|-----------|-----------------------------------|----------------------------|

|                           |                                                   |                                                   |
|---------------------------|---------------------------------------------------|---------------------------------------------------|
| Maximum Speed             | 5,500 rpm                                         | 5,500 rpm                                         |
| Maximum RCF               | 4,904 x g                                         | 4,904 x g                                         |
| Maximum Capacity          | 4 x 750 mL                                        | 4 x 750 mL                                        |
| Speed Accuracy            | ±10 rpm                                           | ±10 rpm                                           |
| Time Setting Range        | 1 s to 99 min 59 s; 1 min to 99 h 59 min          | 1 s to 99 min 59 s; 1 min to 99 h 59 min          |
| Timing Modes              | Start timing, speed timing, continuous timing     | Start timing, speed timing, continuous timing     |
| Temperature Setting Range | -20°C to 40°C                                     | Not applicable                                    |
| Temperature Accuracy      | ±0.5°C                                            | Not applicable                                    |
| Pre-Cooling Function      | Yes                                               | Not applicable                                    |
| Compressor Unit           | High performance compressor, R134a refrigerant    | Not applicable                                    |
| Noise Level               | ≤65 dB(A)                                         | ≤65 dB(A)                                         |
| Short Spin                | Yes                                               | Yes                                               |
| Rotor Identification      | Yes                                               | Yes                                               |
| Voltage                   | AC 220 V ±22 V, 50/60 Hz (110V is also available) | AC 220 V ±22 V, 50/60 Hz (110V is also available) |
| Power Consumption         | 1.6 kW                                            | 900 W                                             |
| Dimensions (W x D x H)    | 713 x 681 x 398 mm                                | 510 x 635 x 398 mm                                |
| Packing Dimensions        | 860 x 810 x 620 mm                                | 660 x 770 x 450 mm                                |
| Net Weight                | 95 kg                                             | 76 kg                                             |

## Rotor Range

| Rotor   | Type                                   | Maximum Capacity                     | Maximum Speed | Maximum RCF |
|---------|----------------------------------------|--------------------------------------|---------------|-------------|
| Rotor 1 | Fixed angle                            | 40 x 15 mL                           | 5,500 rpm     | 4,904 x g   |
| Rotor 2 | Swing-out (buckets ordered separately) | 4 x 500 mL                           | 4,000 rpm     | 3,345 x g   |
| Rotor 3 | Swing-out (buckets ordered separately) | 4 x 750 mL                           | 4,000 rpm     | 3,500 x g   |
| Rotor 4 | Swing-out with automatic de-capping    | 120 tubes (13 x 75 mm / 13 x 100 mm) | 4,000 rpm     | 3,370 x g   |

## Bucket and Adapter Options

| Rotor   | Bucket                                                    | Adapter Capacities                                                                                                                                                                                                                                                                                                       |
|---------|-----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Rotor 1 | Not applicable                                            | Custom configurations available on request                                                                                                                                                                                                                                                                               |
| Rotor 2 | Round bucket; aerosol-tight round bucket                  | 4 x 1 x 250 mL; 4 x 2 x 100 mL; 4 x 4 x 50 mL (conical/round); 4 x 7 x 20 mL; 4 x 9 x 15 mL (conical/round); 4 x 11 x 15 mL conical (cap ≤21.5 mm); 4 x 14 x 10 mL; 4 x 19 x 5/7 mL vacuum blood collection; 4 x 36 x 1.5 mL                                                                                             |
| Rotor 2 | Rectangular bucket; rectangular bucket with sealing cover | 4 x 1 x 250 mL; 4 x 3 x 100 mL; 4 x 6 x 50 mL (conical/round); 4 x 12 x 15 mL (conical/round); 4 x 20 x 10 mL; 4 x 31 x 5/7 mL vacuum blood collection; 4 x 56 x 1.5 mL                                                                                                                                                  |
| Rotor 3 | Round bucket; aerosol-tight round bucket                  | 4 x 1 x 500 mL (conical/flat); 4 x 1 x 250 mL (conical/flat); 4 x 4 x 100 mL; 4 x 5 x 50 mL (self-standing); 4 x 7 x 50 mL (conical/round); 4 x 10 x 20 mL; 4 x 15 x 15 mL (conical); 4 x 19 x 10 mL (self-standing); 4 x 21 x 10 mL; 4 x 27 x 5/7 mL vacuum blood collection; 4 x 37 x 5 mL (RIA tube); 4 x 56 x 1.5 mL |
| Rotor 3 | Rectangular bucket                                        | 4 x 9 x 50 mL (conical/round); 4 x 19 x 15 mL (conical/round); 4 x 30 x 10 mL; 4 x 38 x 5/7 mL vacuum blood collection                                                                                                                                                                                                   |
| Rotor 3 | Microplate bucket                                         | 4 x 2 x 96 deep-well plates; 4 x 4 x 96 microplates (total plate height ≤67 mm)                                                                                                                                                                                                                                          |
| Rotor 4 | Integrated brackets                                       | 13 x 75 mm / 13 x 100 mm tube adapter                                                                                                                                                                                                                                                                                    |

Custom bucket and adapter configurations are available for all swing-out rotors.



**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](mailto: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](mailto: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](mailto:me@torontech.com)

