TORONTECH

ELECTRONIC ANALYTICAL BALANCE

Electronic Analytical Balance (1 mg) - ToronAB™ E Series

ToronAB™ E Series electronic analytical balance delivers 1 mg readability in a compact, fourth-generation platform suited to varied working environments and space-constrained bench configurations. Standard models use an ultra-thin EMF sensor with external calibration; the internal calibration model uses a load-cell sensor for unattended recalibration. A 15–30°C working temperature range, wide-angle HD LCD display, full-capacity tare, and RS232 connectivity are standard across all three models.

The E Series supports counting, percentage, peak hold, and unit conversion functions across all configurations; the internal calibration model additionally provides gsm output for textile and paper area-weight applications. Print output is configurable in three modes (continuous real-time, continuous stable, and single-point) with adjustable baud rate for RS232 transmission. Overload and fault alarms alert the operator before sensor damage occurs, and stability and speed settings allow adjustment of the balance response for the material type being weighed.

The compact housing (305 × 210 × 305 mm) and 5–6 kg weight suit space-constrained benches and mobile deployment between workstations. External calibration models include a φ80 mm pan as standard with a φ90 mm option; the internal calibration model ships with φ90 mm as standard. A three-sided glass sliding door draft shield, adjustable leveling feet, built-in level bubble, and overload and fault alarms are standard across all models.

APPLICATIONS

Electronic Analytical Balance (1 mg) - ToronAB™ E Series Applications

The ToronAB™ E Series serves laboratory and production environments where 1 mg mass accuracy is needed in a compact, portable platform suitable for bench-constrained and temperature-variable settings.

- **Scientific Research and Academia**: quantitative chemistry experiments, reference sample preparation, and mass determination tasks where a compact instrument reduces equipment clutter on shared or multi-user benches
- **Pharmaceutical Manufacturing and QC**: ingredient weighing, batch verification, and quality sampling where 1 mg precision meets formulation requirements and the wide operating temperature range suits production environments
- **Gold and Jewelry**: precise mass measurement of precious metals and gemstones for trade, assay, and lot verification on retail and workshop benches where a full-size balance is impractical
- **Precision Counting**: piece-count mode supports high-accuracy counting of tablets, small components, and electronic parts where individual item weight variation falls at the milligram level
- **Food Science and Nutraceuticals**: minor ingredient weighing for small-batch formulations, supplement preparation, and nutritional testing at 1 mg resolution
- **Textile and Paper Applications (N Model)**: the gsm display function of the internal calibration model supports area-weight measurement of fabric samples, filter papers, and sheet materials
- **Medical and Clinical Laboratories**: mass determination for diagnostic reagent preparation and sample aliquoting in settings where bench space is limited
- **Environmental Sampling**: filter media weighing, sample mass determination, and reference material preparation in field-adjacent or site laboratory environments


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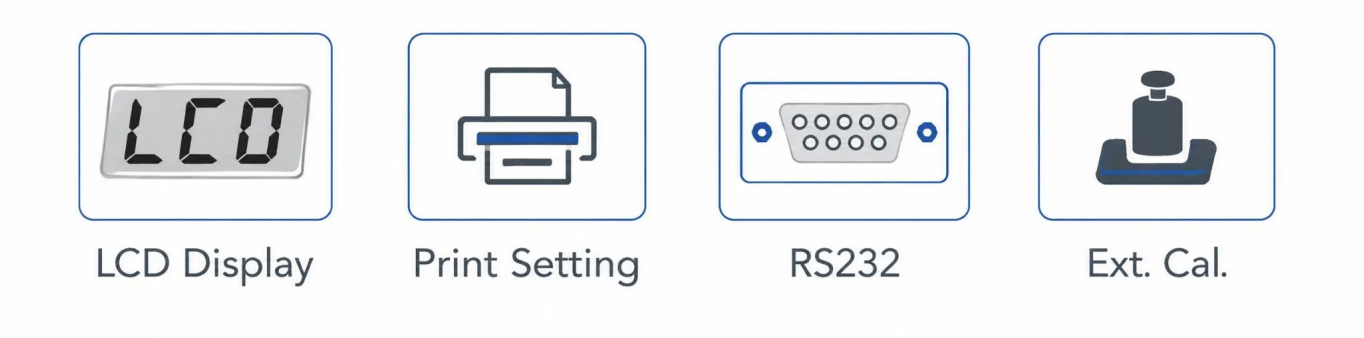
FEATURES

Electronic Analytical Balance (1 mg) - ToronAB™ E Series Key Features



The ToronAB™ E Series delivers 1 mg precision in a compact multi-function platform available with external or auto-internal calibration and a choice of sensing technology.

- **Fourth-Generation Ultra-Thin EMFR Sensor (E Models)**: compact EMF cell delivers 1 mg accuracy while keeping the balance depth to 305 mm, suited to space-constrained laboratory and production workstations
- **Load-Cell Sensor with Temperature Compensation (N Model)**: the auto-internal calibration model uses a strain-gauge load cell as an alternative sensing technology, with built-in temperature compensation across the 15–30°C operating range
- **Auto Timed Internal Calibration (N Model)**: built-in calibration weight deploys automatically when temperature drift is detected, maintaining accuracy without operator involvement
- **One-Touch Manual Calibration (N Model)**: a single keypress triggers immediate on-demand calibration of the internal reference weight, allowing recalibration at any point during use
- **Wide-Angle HD LCD Display**: 96 × 24 mm high-definition LCD screen presents mass readings clearly from a wide horizontal viewing angle, reducing readout errors in shared environments
- **Full-Capacity Tare**: tare function operates across the entire weighing range, zeroing the display with any container before sample addition

- **Counting Function**: piece-count mode calculates quantity from a stored reference piece weight, supporting production counting and receiving inspection tasks
- **Percentage Function**: percentage mode compares each reading against a stored reference to display a percentage value, supporting fill-ratio and formula proportion control
- **Peak Hold**: locks the displayed maximum reading during dynamic weighing events, capturing peak mass for filling, dispensing, and flow monitoring applications
- **Unit Conversion**: external calibration models convert between g, mg, ct, and oz; the internal calibration model converts between g, ct, oz, and gsm (grams per square meter) for textile and paper applications
- **Stability and Speed Setting**: adjustable response characteristics allow the operator to balance readout speed against settling stability for the material being weighed
- **Multi-Mode Print Output**: three modes (continuous real-time, continuous stable, and single-point) with configurable baud rate for RS232 output to a printer or data management system
- **RS232 Serial Interface**: standard RS232 connects all E Series models to printers or data systems for direct weighing output
- **Optional External Printer**: an optional printer connects via RS232 for generating paper records of weighing sessions
- **Overload and Fault Alarm**: visual alerts for tare overload, weighing underload, and general fault conditions protect the sensor and prevent undetected measurement errors
- **Aluminum Anti-Interference Shell**: aluminum housing shields the sensing cell from electromagnetic disturbance and provides structural stability under daily laboratory use
- **Three-Sided Glass Sliding Door Draft Shield**: three-panel sliding door provides access from multiple angles, simplifying sample placement and container handling
- **Adjustable Leveling Feet and Level Bubble**: four adjustable feet and a built-in level bubble allow the operator to confirm correct horizontal positioning on any bench surface
- **Wide Operating Temperature Range (15–30°C)**: extends the E Series to production floors and sampling areas outside a climate-controlled laboratory environment

THEORY & METHOD

Theory and Method

External calibration models in the ToronAB™ E Series use a fourth-generation ultra-thin electromagnetic force restoration (EMFR) cell to determine mass. A coil in a permanent magnetic field connects to the weighing pan; sample mass deflects the coil, and the control circuit restores it by adjusting the coil current. The restoring current is proportional to applied mass, and the processor converts it to a 1 mg reading within three seconds. The ultra-thin cell design reduces sensor footprint, enabling the compact 305 mm housing depth.

The internal calibration model uses a load-cell sensor, converting applied mass to an electrical signal through strain gauge elements bonded to a metal spring. Sample mass deflects the spring; the bonded gauges change electrical resistance in proportion to the deflection, and a bridge circuit converts this resistance change to a voltage proportional to mass. The processor linearizes and converts this voltage to a 1 mg reading within three seconds. Temperature compensation corrects for thermal effects on the gauge material across the 15–30°C operating range.

Automatic timed internal calibration in the auto-internal variant deploys a built-in reference weight when temperature drift is detected, updating the calibration coefficient without operator involvement. A one-touch trigger also allows immediate on-demand recalibration. External calibration models require the operator to place a known calibration weight on the pan and run the sequence at defined intervals. Both approaches correct for the same environmental offsets; the choice depends on calibration frequency and whether external reference weights are maintained in the working environment.

TECHNICAL SPECIFICATIONS

Electronic Analytical Balance (1 mg) - ToronAB™ E Series Technical Specifications

Standard Models (External Calibration, EMFR Sensor)

Parameter	ToronAB™ E200	ToronAB™ E500
Capacity	200 g	500 g
Readability	1 mg	
Sensor	EMFR	
Pan Size	φ80 mm (Std) / φ90 mm (Opt)	
Calibration Mode	External	
Unit Conversion	g / mg / ct / oz	

Auto-Internal Calibration Model (Load-Cell Sensor)

Parameter	ToronAB™ E220N
Capacity	220 g
Readability	1 mg
Sensor	Load cell
Pan Size	φ90 mm (Standard)
Calibration Mode	Internal (automatic)
Unit Conversion	g / ct / oz / gsm

Common Specifications

Parameter	Specification

Minimum Weight	20 mg
Repeatability	±2 mg
Linearity	±3 mg
Display	HD LCD, 96 × 24 mm
Stabilization Time	≤3 s
Working Temperature	15–30°C
Interface	RS232
Optional	External printer
Windshield Inner Dimensions	175 × 165 × 200 mm
Product Dimensions (W × D × H)	305 × 210 × 305 mm
Packing Dimensions	425 × 310 × 410 mm
Gross Weight	6 kg (E Models) / 5 kg (E220N)

TORONTECH.com

TORONTECH

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

USA | Canada | EU | UAE | GCC | KSA | India | Africa | Latin America | Asia