



TORONTECH

MULTI-FUNCTION ANALYTICAL BALANCE



Multi-Function Analytical Balance (0.1 mg) - ToronAB™ MF Series

ToronAB™ MF Series multi-function analytical balance combines a fourth-generation ultra-thin electromagnetic force restoration sensor with twelve user-configurable functional settings, delivering 0.1 mg readability across a compact platform suited to a wide variety of working environments. Four capacity models span between 100 g and 220 g, each available in both external and auto-internal calibration variants. At 6 kg and 305 × 210 × 305 mm, the MF Series targets space-constrained workstations and portable-adjacent applications where a standard-format analytical balance is impractical.

Standard models with external calibration use a separately supplied calibration weight placed on the pan by the operator, making them cost-effective for environments where calibration is infrequent. Auto-internal calibration models deploy a built-in reference weight automatically when the balance detects temperature drift, removing the need for manual calibration steps during continuous operation. The auto-internal calibration variant also supports one-click manual calibration for on-demand correction when conditions shift. Both calibration types share the same functional settings, display, and RS232 connectivity.

The three-sided glass draft shield uses a glass extension track on each door to prevent unintended sliding, and the door-slot design simplifies sample loading with large containers. A standard ø80 mm 304 stainless steel pan accommodates most laboratory vessels, with a ø90 mm pan available as an option. Adjustable leveling feet and a built-in level bubble confirm correct horizontal positioning before use. The wide-angle HD LCD display with a 96 × 24 mm screen presents the readout clearly at various viewing distances.

APPLICATIONS

Multi-Function Analytical Balance (0.1 mg) - ToronAB™ MF Series Applications

The ToronAB™ MF Series suits a broad range of laboratory and production environments where 0.1 mg mass accuracy is required, particularly where counter space is limited or the balance needs to be repositioned between tasks.

- **Pharmaceutical Research and QC:** weighing active pharmaceutical ingredients, excipients, and formulation components, with the auto-internal calibration variant supporting continuous-use environments where ambient temperature variation affects accuracy
- **Chemical Analysis Laboratories:** preparation of reagent solutions, standard dilutions, and gravimetric analysis samples at 0.1 mg resolution
- **Scientific Research and Academia:** bench-scale quantitative chemistry, mass determination for density experiments, and instrument calibration in university and research settings
- **Food Science and Nutraceuticals:** measuring minor ingredient quantities during product development, specification verification, and nutritional formulation
- **Medical and Clinical Testing:** precise mass measurement for diagnostic reagent preparation, sample aliquoting, and test kit component weighing
- **Environmental Laboratory Work:** initial sample mass determination before extraction, digestion, or spectrometric analysis where accurate starting mass is required for concentration calculations
- **Quality Control and Production:** counting and percentage weighing modes support incoming material checks, batch fill monitoring, and component ratio verification
- **Gold and Jewelry:** 0.1 mg readability supports precious metal and gemstone mass measurement for assay, trade, and hallmarking applications



FEATURES

Multi-Function Analytical Balance (0.1 mg) - ToronAB™ MF Series Key Features

The ToronAB™ MF Series packs twelve functional settings into a compact platform, offering the same analytical capability as larger instruments in a reduced footprint.



LCD Display



Print Setting



RS232



Ext. Cal.
(FA, F)

- **Fourth-Generation Ultra-Thin EMFR Sensor:** advanced compact force cell delivers 0.1 mg resolution while keeping the overall balance depth to 305 mm, suited for bench space-constrained laboratory environments
 - **Wide-Angle HD LCD Display:** the 96 × 24 mm screen presents mass readings clearly across a wide horizontal viewing angle, reducing readout errors in shared laboratory settings
 - **Auto Timed Internal Calibration (N Models):** balance monitors ambient temperature and deploys its built-in calibration weight automatically when drift is detected, maintaining accuracy without operator intervention
 - **One-Click Manual Calibration (N Models):** a single keypress initiates on-demand calibration of the internal reference weight, allowing immediate recalibration when working conditions change
 - **External Calibration (Standard Models):** standard models perform calibration using a separately supplied calibration weight placed on the pan, guided by a simple key sequence
 - **Estimation Digit Display (Optional):** an additional estimated digit extends the displayed reading, helping operators monitor convergence and stability during sample settling
 - **Tare Function:** full-capacity tare zeroes the display with any container across the entire weighing range
 - **Counting Function:** piece-count mode calculates quantity from a stored reference piece weight, supporting production counting and component verification tasks
 - **Percentage Weighing:** compares each reading against a stored reference to display a percentage value, supporting formula verification and fill ratio control
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- **Peak Hold:** locks the displayed maximum reading during dynamic weighing events, capturing peak mass for filling, dispensing, and process monitoring
 - **Unit Conversion:** reading switches between g, mg, ct, and oz without hardware adjustment, supporting multi-discipline use across a single instrument

Design Details

three-sided opening

Three-door glass and slot
Convenient for placing items



Glass extension track

Prevent the glass door
from sliding



Level bubble

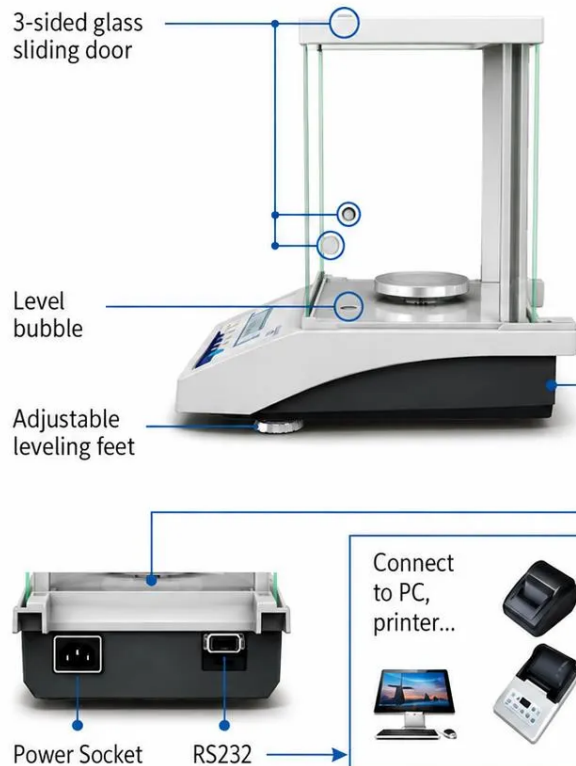
Adjust the balance for more
accurate measurement



304 stainless steel pan

Standard $\phi 80\text{mm}$
Optional $\phi 90\text{mm}$

Product Appearance



- **Multi-Mode Print Output:** three output modes (continuous real-time, continuous stable, and single-point) align balance output with the operator's workflow
- **RS232 Serial Interface:** standard RS232 connects the balance to printers, PCs, or central control equipment; baud rate is user-configurable at 1200, 2400, 4800, or 9600 bps
- **Display Speed and Sensitivity Adjustment:** response characteristics are adjustable between fast readout and stable display to match the sample type being weighed

- **Overload and Fault Alarm:** visual alerts for tare overload, weighing underload, and general faults protect the sensor and prevent undetected measurement errors
- **304 Stainless Steel Weighing Pan:** standard $\phi 80$ mm pan provides a corrosion-resistant, chemically inert weighing surface; a $\phi 90$ mm pan is available as an option
- **Glass Extension Track:** each draft shield door rides on a dedicated extension track, preventing unintended sliding and maintaining a sealed weighing environment during operation
- **Three-Sided Glass Draft Shield:** three-panel sliding door design provides access from multiple angles, simplifying sample placement and container handling
- **Adjustable Leveling Feet:** four adjustable feet and a built-in level bubble allow the operator to confirm correct horizontal positioning on any bench surface

THEORY & METHOD

Theory and Method

The ToronAB™ MF Series uses a fourth-generation ultra-thin electromagnetic force restoration (EMFR) cell to convert applied mass to a digital reading. A flat coil assembly suspended in a permanent magnetic field connects directly to the weighing pan through a rigid linkage. Sample mass deflects the coil from its equilibrium position, and the control electronics restore it by supplying a precisely measured restoring current. The current magnitude is linear with applied force, and the microprocessor translates it to a mass reading at 0.1 mg resolution.

Calibration aligns the balance output with a traceable mass reference, correcting for offsets introduced by temperature or environmental drift. External calibration models require the operator to place a known calibration weight on the pan and initiate the sequence; the balance stores the resulting correction factor for subsequent readings. Auto-internal calibration models monitor ambient temperature and deploy an integrated reference weight automatically when drift exceeds the correction threshold. A one-click trigger also allows on-demand calibration of the auto-internal variant without removing it from service.

The three-sided draft shield uses a glass extension track on each door, preventing panels from sliding open during operation or transport. The 304 stainless steel pan provides a chemically inert, easy-clean weighing surface resistant to typical laboratory reagents. Adjustable leveling feet compensate for uneven bench surfaces, and the built-in level bubble provides a visual reference for horizontal orientation before each weighing session. The ultra-thin fourth-generation EMFR cell reduces the overall platform depth to 305 mm, lowering the bench footprint without affecting measurement accuracy.

TECHNICAL SPECIFICATIONS

Multi-Function Analytical Balance (0.1 mg) - ToronAB™ MF Series
Technical Specifications

Standard Models (External Calibration)

Parameter	ToronAB™ MF100	ToronAB™ MF120	ToronAB™ MF200	ToronAB™ MF220
Capacity	100 g	120 g	200 g	220 g
Readability	0.1 mg			
Calibration Weight	100 g	100 g	200 g	200 g
Calibration Mode	External			

Auto-Internal Calibration Models (N)

Parameter	ToronAB™ MF100N	ToronAB™ MF120N	ToronAB™ MF200N	ToronAB™ MF220N
Capacity	100 g	120 g	200 g	220 g

Parameter	ToronAB™ MF100N	ToronAB™ MF120N	ToronAB™ MF200N	ToronAB™ MF220N
Readability	0.1 mg			
Calibration Weight	100 g	100 g	200 g	200 g
Calibration Mode	Internal (auto)			

Common Specifications

Parameter	Specification
Minimum Weight	10 mg
Repeatability	±0.2 mg
Linearity	±0.3 mg
Display	HD LCD, 96 × 24 mm
Pan Size	ø80 mm (Standard), ø90 mm (Optional)
Stabilization Time	≤3 s
Working Temperature	18-23°C
Voltage	100-240 V, 50/60 Hz
Interface	RS232
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



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