TORONTECH

PRECISION R&D DRYING OVEN

Precision R&D Drying Oven – ToronOVEN™ RD

ToronOVEN™ RD is a high-performance laboratory blast drying oven built for demanding research, industrial, and quality-control environments that require tight temperature precision, advanced programmable control, and seamless connectivity. Operating up to 300°C across five capacity options (64 L to 452 L). The ToronOVEN™ RD combines the BRIGHT I control system, dual over-temperature protection, 6-stage fan speed regulation, and an RS-485 interface into a single, fully featured drying oven platform.

The ToronOVEN™ RD Precision R&D Drying Oven is engineered for researchers, engineers, and quality-control professionals who need more than a basic blast drying oven can offer. At its core is the BRIGHT I control system, which delivers real-time LCD readout of setpoint temperature, actual temperature, operational status, fan segment number, and working state — giving operators complete process visibility at a glance. A 10-segment, 100-cycle programmable engine supports complex ramp-and-soak thermal profiles for accelerated aging, multi-step drying sequences, and precision heat-treatment protocols that are difficult or impossible to execute on simpler drying ovens.

What sets the ToronOVEN™ RD apart from comparable Precision R&D Drying Ovens is its dual over-temperature alarm system. Rather than relying on a single safety circuit, it combines an RTD-based temperature sensor alarm with an entirely independent hardware temperature-control switch — two independent protection layers that guard both samples and equipment even in the event of a primary controller fault.

The fan features six discrete speed levels and a preheating chamber design to ensure uniform air distribution and fast thermal recovery, while the standard RS-485 communication interface enables direct integration with laboratory information management systems (LIMS), data loggers, or Ethernet gateways. Optional accessories — including a built-in printer, online monitoring platform, inlet and outlet air filters, and GPRS SMS alarm — allow the ToronOVEN™ RD to be configured as a fully connected, auditable Precision R&D Drying Oven for regulated environments.

APPLICATIONS

Precision R&D Drying Oven – ToronOVEN™ RD Applications

The ToronOVEN™ RD laboratory blast drying oven is suited to a wide range of precision thermal processing applications, including:

- High-temperature sample drying & dehydration
- Dry heat sterilization of lab ware & instruments
- Accelerated aging & stability testing with custom ramp-soak profiles
- Annealing & stress relief of metals & alloys
- Curing of high-temperature coatings & adhesives
- Electronics baking & component outgassing
- Pharmaceutical & medical device processing
- Ceramic & composite pre-sintering
- Material research & quality-control validation in regulated labs
- Remote-monitored or networked drying oven workflows

ToronOVEN™ RD Series
Precision R&D Drying Oven
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FEATURES

Precision R&D Drying Oven – ToronOVEN™ RD Key Features

- BRIGHT I control system with LCD simultaneously displays setpoint temperature, actual temperature, operational status, active fan segment number, and working state — providing complete at-a-glance process visibility for Precision

R&D Drying Oven operations

- Countdown reservation function with a timing range of 0 to 9,999 minutes, allowing users to pre-schedule delayed-start drying oven cycles for off-hours or overnight operation without manual intervention
- Advanced programmable engine supports 10 ramp-and-soak segments per cycle with up to 100 consecutive execution cycles, enabling multi-step thermal protocols for accelerated aging, stepwise drying, and precision heat-treatment in a single automated run
- Dual over-temperature alarm system provides two independent layers of protection: (A) an RTD-sensor-based software alarm integrated into the BRIGHT I controller, and (B) a completely independent hardware temperature-control switch that remains active even if the primary control circuit fails
- Heavy-duty door with rotary two-stage locking structure maintains a consistent, high-integrity chamber seal at sustained operating temperatures up to 300°C, minimizing heat loss and preventing temperature deviation during long-duration runs
- 6-stage adjustable fan speed paired with a preheating chamber design conditions and circulates heated air uniformly across the entire working space — the defining advantage of a forced-air blast drying oven over passive gravity-convection alternatives
- Standard RS-485 communication interface enables direct integration with laboratory information management systems (LIMS), data loggers, computers, and Ethernet gateways for real-time data acquisition and remote process monitoring
- Configurable with optional accessories including a built-in printer for on-demand record output, an online monitoring platform for remote oversight, inlet and outlet air filters for clean-room or particulate-sensitive environments, and a GPRS SMS alarm for remote fault notification

THEORY & METHOD

Theory and Method

The ToronOVEN™ RD operates on the principle of forced-air convection. An electrically powered heating element raises the internal chamber temperature, while a variable-speed centrifugal fan — adjustable across six discrete speed levels — continuously circulates heated air throughout the working space. This blast drying approach eliminates thermal stratification and delivers significantly faster, more uniform heat transfer than passive gravity-convection drying ovens. The preheating chamber design further conditions incoming air before it reaches the main workspace, improving cross-section temperature uniformity and shortening stabilization time after door openings or sample loading.

Temperature is monitored by a precision RTD sensor that feeds continuous live data to the BRIGHT I microprocessor controller. The controller applies closed-loop PID (Proportional-Integral-Derivative) algorithms to modulate heater output and maintain the setpoint within a fluctuation of ±0.3°C at 150°C for the two smallest models, and ±0.5°C for the larger configurations — performance that is substantially tighter than standard Precision R&D Drying Ovens. Temperature uniformity across the chamber is maintained within ±1% of the setpoint in the RT+5°C to 105°C range and within ±2% from 105°C to 300°C.

The ToronOVEN™ RD employs a dual over-temperature alarm architecture that is unique among laboratory blast drying ovens at this price point. The primary protection layer is an RTD-sensor-based software alarm embedded in the BRIGHT I control system. The secondary layer is a completely independent hardware temperature-control switch that operates outside the main controller — meaning it remains active and effective even if the primary control circuit fails. The BRIGHT I programmable engine supports 10-segment ramp-and-soak profiles with up to 100 consecutive execution cycles, enabling complex multi-step thermal protocols for accelerated aging, staged drying, or precise heat-treatment sequences. Countdown timing and reservation scheduling allow unattended, delayed-start operation, while the built-in RS-485 interface enables real-time data output to computers, LIMS, and remote monitoring platforms.

TECHNICAL SPECIFICATIONS

Precision R&D Drying Oven – ToronOVEN™ RD Technical Specifications

Parameter	ToronOVEN™ RD 64	ToronOVEN™ RD 129	ToronOVEN™ RD 210	ToronOVEN™ RD 284	ToronOVEN™ RD 452
Volume (L)	64	129	210	284	452
Temperature Range (°C)	RT+5 ~ 300				
Temp. Resolution (°C)	0.1				
Temp. Fluctuation at 150°C (°C)	±0.3		±0.5		
Temp. Uniformity	±1% (RT+5°C ~ 105°C) | ±2% (105°C ~ 300°C)				
Heating Rate to 150°C (min)	17	20	20	20	22
Rated Power (W)	1,550	2,150	2,750	2,750	3,500
Voltage (V, Hz)	220 ±10, 50/60 (110V is also available)				
Timer Range (min or h)	0 – 9,999				
Reservation Range (min)	0 – 9,999				
Interior Dimensions W×D×H (mm)	410×350×450	570×400×570	630×530×630	720×530×745	600×580×1,300
Exterior Dimensions W×D×H (mm)	555×566×722	715×616×842	775×746×902	865×746×1,017	774×845×1,704
Shelves — Standard / Max (pcs)	2 / 5	2 / 7	3 / 7	3 / 9	4 / 13
Max Load per Shelf (kg)	25				
Net Weight / Gross Weight (kg)	42 / 60	57 / 75	77 / 96	97 / 118	145 / 174
Package Size (mm)	675×726×872	835×776×992	895×906×1,052	985×906×1,167	894×1,005×1,854

RT = ambient room temperature. Temperature fluctuation measured at 150°C. Heating rate expressed in minutes to reach 150°C. All dimensions in millimeters (mm). Specifications subject to change without notice.

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