



INTEGRATED VACUUM OVEN WITH BUILT-IN PUMP

Integrated Vacuum Oven with Built-In Pump — ToronOVEN™ V-IP Series

ToronOVEN™ V-IP is a large-capacity vacuum oven built around a fully integrated design that houses a standard vacuum pump inside a dedicated noise-reducing cabinet beneath the working chamber. This self-contained configuration eliminates the need for a separate external pump, vacuum lines, or additional bench space giving laboratories a complete, ready-to-operate vacuum oven system in a single floor-standing footprint.

Available in five chamber volumes (30 L, 53 L, 100 L, 250 L, and 500 L) the ToronOVEN™ V-IP series covers a broad range of laboratory and industrial vacuum drying requirements, from compact research applications through high-throughput production-scale programs. All models achieve a vacuum degree of 133 Pa and operate across a temperature range of RT+10°C to 250°C, with temperature fluctuation held to $\pm 1^\circ\text{C}$. A programmable timer supports run durations from 0 to 9999 minutes.

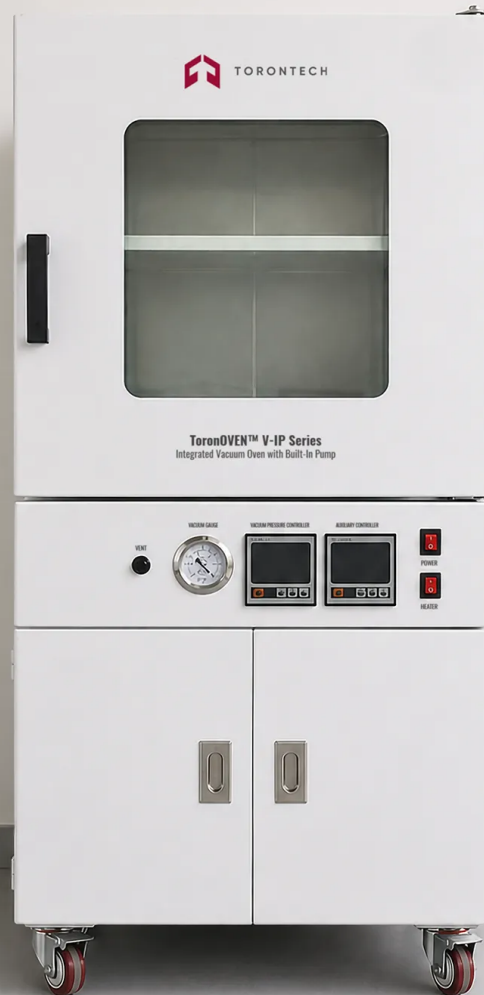
Like the ToronOVEN™ V-IZ, each heating shelf in the ToronOVEN™ V-IP operates as an independent temperature zone with its own dedicated controller and display dashboard — allowing simultaneous processing of samples at different thermal setpoints within the same evacuated chamber. This multi-zone capability, combined with the integrated pump design, makes the ToronOVEN™ V-IP a practical alternative to both standard bench-top vacuum ovens and conventional drying ovens for laboratories where operational simplicity and working volume are both priorities. A power recovery function retains all active setpoints and timer states following any power interruption. An optional oil filter accessory is available for installations requiring extended pump protection.

APPLICATIONS

Integrated Vacuum Oven with Built-In Pump — ToronOVEN™ V-IP Series Applications

The ToronOVEN™ V-IP serves laboratory and industrial environments where a self-contained, large-volume vacuum oven with independent multi-shelf temperature control is required:

- General Laboratory Vacuum Drying: the primary application; moisture removal from pharmaceutical, chemical, food, and material samples under 133 Pa vacuum conditions without requiring a separate pump or external vacuum supply infrastructure
- Multi-Product Simultaneous Processing: independent shelf temperature control allows researchers to dry or process samples with different thermal requirements on separate shelves within a single evacuated chamber run
- Pharmaceutical Manufacturing and QC: vacuum drying of APIs, granules, excipients, and solid dosage intermediates at shelf-specific temperatures aligned with individual product thermal limits
- Degassing and Outgassing: removal of dissolved gases and volatile compounds from adhesives, resins, epoxies, and polymer materials under controlled 133 Pa vacuum conditions
- Electronics and Material Testing: low-temperature vacuum drying and thermal conditioning of PCBs, sensors, composites, and advanced materials where atmospheric oxygen exposure during heating would compromise results
- Food Science and Analytical Chemistry: moisture content determination, loss-on-drying analysis, and vacuum thermal processing of food and agricultural samples per standard analytical methods
- Industrial QC and Manufacturing: high-volume vacuum conditioning and product drying programs where the 250 L and 500 L models provide capacity that benchtop drying oven configurations cannot match
- Research Institutions: general-purpose vacuum oven applications for chemistry, materials science, pharmaceutical science, and engineering research programs requiring a complete, self-contained vacuum system



FEATURES

Integrated Vacuum Oven with Built-In Pump — ToronOVEN™ V-IP Series

Key Features



Integrated Vacuum System

- Standard vacuum pump housed inside a built-in noise-reducing cabinet — no external pump, external vacuum lines, or additional floor space required
- Vacuum degree: 133 Pa across all five models
- Self-contained, factory-matched pump-to-chamber configuration for simplified installation and consistent vacuum performance
- Optional oil filter accessory for pump protection in solvent-heavy processing applications

Independent Multi-Zone Shelf Temperature Control



- Each heating shelf operates as an independent temperature control zone with dedicated microcomputer controller
- Separate front-panel dashboard per shelf displays setpoint and measured temperature independently
- Simultaneous processing of samples at different temperatures on separate shelves within a single evacuated chamber

Control System and Timer

- Microcomputer single-chip temperature control system per shelf zone with over-temperature alarm
- Programmable timer: 0-9999 minutes for flexible short-cycle and extended vacuum processing programs
- Power recovery function retains all active setpoints, timer states, and process data after power interruption or system halt

Chamber and Door Design

- Cold-rolled steel exterior with electrostatic spray finish; stainless steel interior working chamber
- Toughened, bulletproof double glass door window for visual sample monitoring without venting
- Adjustable door with silicone rubber perimeter seal for consistent vacuum integrity over the service life
- 1 shelf standard (30 L); 2 shelves standard (53 L and 100 L); 3 shelves standard (250 L); 4 shelves standard (500 L)

THEORY & METHOD

Theory and Method

Integrated Vacuum Pump System

The defining design feature of the ToronOVEN™ V-IP is the integration of a standard vacuum pump inside a noise-reducing cabinet housed within the instrument base, directly beneath the working chamber. This built-in configuration achieves 133 Pa vacuum degree — the same performance level as external-pump configurations — while eliminating the separate equipment, external vacuum lines, and additional bench or floor space that external pump setups require. The noise-reducing cabinet attenuates pump operating sound, making the ToronOVEN™ V-IP more suitable for shared laboratory environments where a standalone rotary vane pump would generate unacceptable acoustic output.

From an operational standpoint, the integrated design also simplifies system startup. There is no pump-to-chamber connection to verify, no separate pump power switch to manage, and no risk of mismatched pump capacity for the chamber volume — the system is factory-configured and ready to operate as a matched unit. An optional oil filter accessory is available for installations where pump oil contamination from processed samples is a concern.

Independent Multi-Zone Shelf Temperature Control

Each heating shelf in the ToronOVEN™ V-IP operates as an independent heating zone with its own dedicated microcomputer single-chip temperature control system and front-panel dashboard displaying that shelf's setpoint and measured temperature independently. This per-shelf control architecture allows different temperature setpoints to be active simultaneously on upper and lower shelves within the same evacuated chamber — enabling multi-product or multi-protocol vacuum drying runs that single-zone vacuum ovens and conventional drying ovens cannot support without separate sequential runs.

Temperature fluctuation is held to $\pm 1^{\circ}\text{C}$ across all models and operating temperatures. An over-temperature alarm activates when any shelf temperature exceeds its programmed threshold, providing process safety coverage for unattended multi-hour vacuum drying programs.

Vacuum Integrity and Chamber Construction

The working chamber interior is fabricated from stainless steel for corrosion resistance and chemical compatibility across the broad range of compounds processed in a laboratory vacuum oven. The exterior shell uses cold-rolled steel plate with an electrostatic spray finish. The door incorporates an adjustable silicone rubber perimeter seal — consistent compression across the door frame is the primary determinant of sustained vacuum integrity at 133 Pa during extended thermal processing cycles. The toughened, bulletproof double glass door window allows visual monitoring of samples on all shelf levels without venting the chamber.

Timer, Data Protection, and Process Control

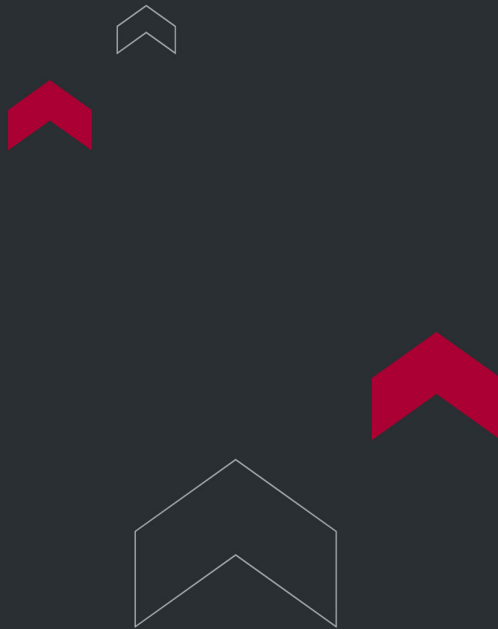
A programmable timer supports run durations from 0 to 9999 minutes. A power recovery function retains all active setpoints, timer states, and process data following any power interruption — protecting long-cycle vacuum drying programs from uncontrolled restart or data loss conditions that would require chamber venting and full process restart.

TECHNICAL SPECIFICATIONS

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Technical Specifications

Parameter	ToronOVEN™ V-30IP	ToronOVEN™ V-53IP	ToronOVEN™ V-100IP	ToronOVEN™ V-250IP	ToronOVEN™ V-500IP
Chamber Volume (L)	30	53	100	250	500
Temp. Range (°C)	RT+10 to 250				
Temp. Fluctuation (°C)	±1				
Vacuum Degree (Pa)	133				
Rated Power (W)	450	1200	1400	2800	4000
Voltage	220V ±10V, 50/60 Hz (110 is also available)				380V ±10V, 50 Hz
Timer Range (min)	0-9999				
Internal Dimensions W×D×H (mm)	320×320×300	415×370×345	450×500×450	600×600×700	630×810×845
External Dimensions W×D×H (mm)	480×530×1015	575×550×1060	620×640×1165	770×780×1515	800×990×1660
Number of Shelves	1	2	2	3	4
Net Weight (kg)	84	109	129	228	442
Gross Weight (kg)	98	122	148	251	475
Package Size (mm)	610×580×1240	685×645×1275	720×775×1420	870×880×1650	1090×970×2060



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