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EDWARDS EXPERIMENTAL VACUUM SYSTEMS

EDWARDS
THE PARTNER OF CHOICE

Edwards is a world leader in the design, technology and manufacture of vacuum pumps for industrial applications with over 100 years' history.

We believe in delivering results that bring value to our customers by using our breadth of industry experience to identify and apply solutions to your problems. Using the most innovative and up-to-date modelling techniques, we can optimise the pumping configuration for customers to provide a system design giving the maximum performance in the most reliable and cost-effective way.

MODULAR RESEARCH & TRAINING PLATFORMS FOR HIGH AND ULTRA-HIGH VACUUM SCIENCE

Edwards offers a range of modular experimental vacuum systems designed for hands-on research, instruction, and advanced process development. Each system combines high-performance vacuum hardware with flexible control options - from basic manual push-buttons to fully automated PLC + HMI operation.

Whether you're teaching vacuum science, prototyping technology, or conducting real-world R&D, Edwards Experiemental Vacuum Systems deliver the precision, versatility, and reliability you need, all backed by Edwards' industry-leading vacuum expertise.

Modular & Customizable Design

Edwards Experimental Vacuum Systems are built to adapt. Choose from a wide range of pumps, chamber sizes, gauges, and control options to create a system tailored to your specific research, instructional, or testing needs. Whether you need manual simplicity or full automation, our system scales with your goals.

Real-World Training & Testing Capability

Designed for both education and advanced experimentation, our Experimental Vacuum Systems enable users to simulate real-world high and ultra-high vacuum applications - such as space simulation, materials research, and component testing on a safe, manageable scale. This system is the ideal bridge between classroom learning and industrial practice.

Proven Edwards Engineering

With decades of vacuum expertise behind it, modular platform delivers reliable performance, intuitive control, and safety features built into every configuration. From rugged construction to advanced interlocks and remote operation, our Experimental Vacuum Systems are systems you can depend on for consistent results.

Shown above: Experimental Vacuum System Shown with manual push-button/relay panel

SYSTEM FEATURES

Every system is built for durability, mobility, and modular integration—housing pumps, gauges, and control electronics within a compact, rugged frame. Stainless steel chambers offer strength and chemical compatibility, with customizable ports and viewports. Advanced configurations support electropneumatic valves, multi-stage vacuum measurement, RGAs, and bakeout solutions, enabling precise control of vacuum conditions for diagnostics, process validation, and innovative research.

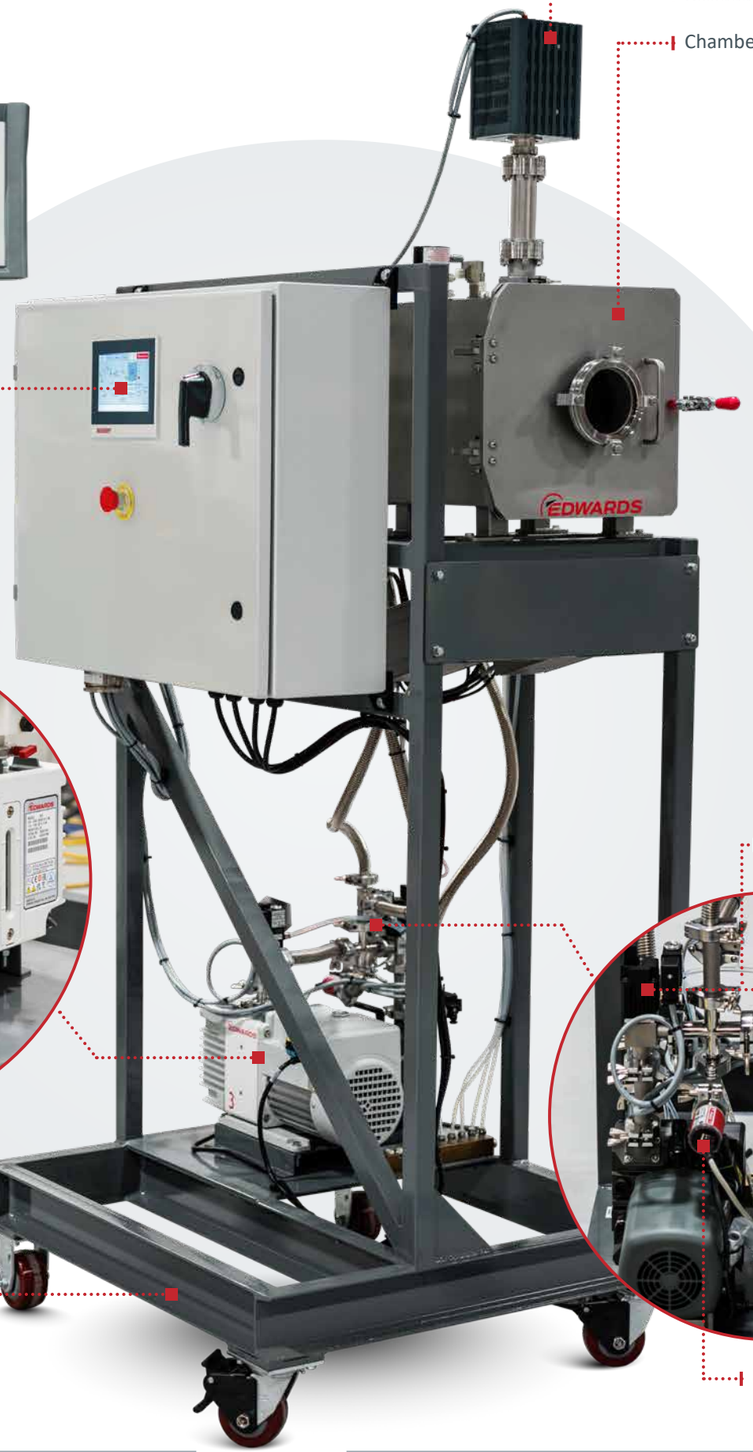
Pictured right: 12" cube chamber system for reference. Your configuration may differ based on selected options.

CONFIGURABLE COMPONENTS

Category	Options
Primary Pump	RV3/5/8/12, mXDS3, nXDS6i/10i/15i, nXR30i
Turbo Pump	nEXT55, 85, 240, 300, 400
Capture Pump	Ion (TiTan series), NEG (NP, NS), TSP, HyTan
Measurement & Control	APG200, AIM200, WRG200, CDG (Barocel), WRH, AIGX, P4, P5, PRA100, PRA100S, PRA200, PRA200S, WRA200S, and WRA300S
Chambers	High or Ultra-high Vacuum Rated, Cube (12"–30"), Cylindrical (12"x18"–24"x30"), Custom Ports Available
Ports	KF, ISO-K/F, CF – various sizes (1.33 to 8")
Viewports	Door or Side mounted (ISO or CF)
Shelving	Removable or sliding internal shelving
Heating/Bakeout	Optional infrared heaters or resistive
Cooling	Optional platen, shroud and chiller
Control	Manual, Semi-Auto (TIC), Full Auto (PLC/HMI), or No Controls

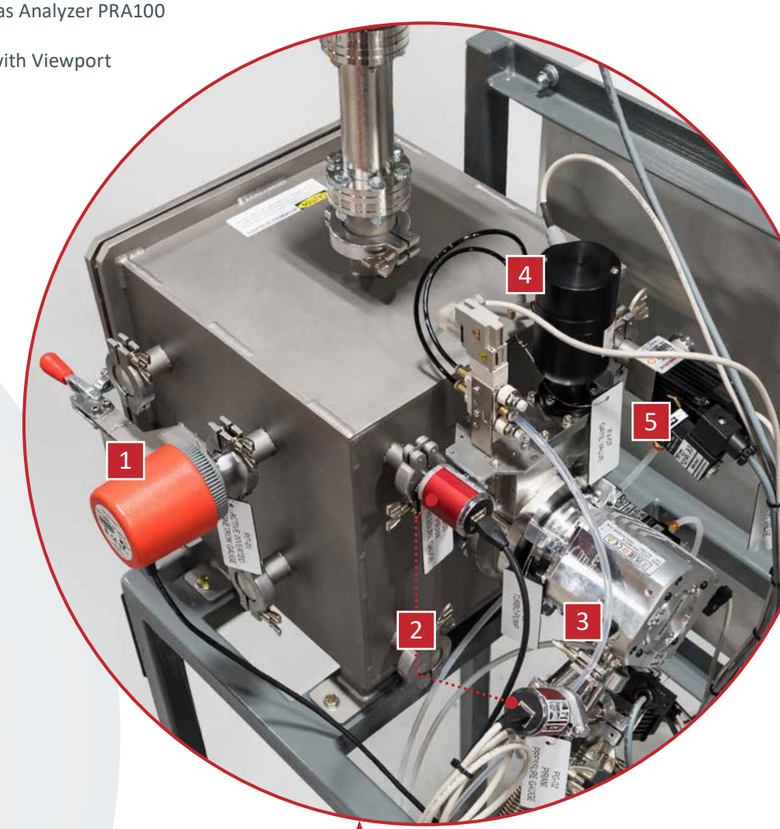
Control Panel with fully automated PLC/HMI Controller

Manual push-button/TIC turbo instrument option shown above



Residual Gas Analyzer PRA100

Chamber with Viewport



View from behind the chamber shown above

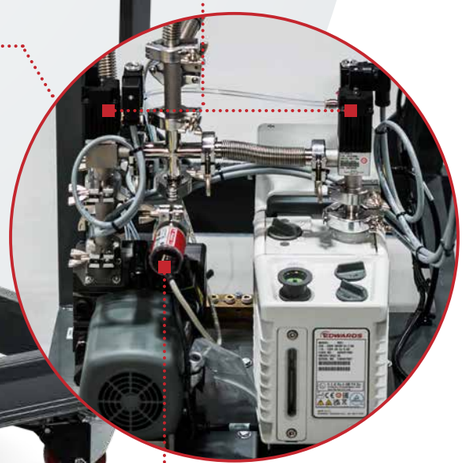
1. AIM Cold Cathode Gauge
2. APG200 Pirani Gauge (2)
3. nEXT55 Turbopump
4. Gate Valve
5. Right Angle Valve

mXDS3 Dry Scroll Pump

RV3 Rotary Vane Pump

Caster-Mounted Welded Steel Frame

Right Angle Valves



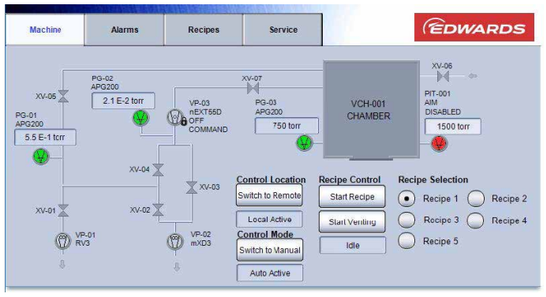
APG200 Pirani Gauge

FULLY AUTOMATED SYSTEM CONTROLS

For users who opt for a fully automated option, our Experimental Vacuum System comes equipped with a Beckhoff PLC-based control panel, bringing advanced control, safety, and ease of operation to your vacuum testing and training workflow.

All functions can be managed directly via the 7” touchscreen interface or remotely using a Windows Remote Desktop connection. The system supports both automatic and manual modes, with pre-programmed pumpdown sequences, intuitive navigation, and integrated safety interlocks that remain active in all modes of operation.

CONTROL INTERFACE SCREENS & FEATURES

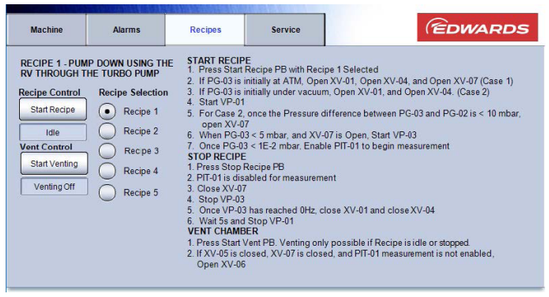


Machine Screen – System Overview

View your entire system at a glance—including backing pumps, turbopump, and pressure gauges. Easily toggle between local and remote operation, and switch between automated recipes or manual control. Interlocks remain active even in manual mode for added protection.

Alarms Screen – Real-Time Alerts

Stay informed with a live feed of active alarms, including emergency stops, circuit breaker trips, and communication errors. Acknowledge and reset alarms directly from the screen, and view a complete history of past system events for troubleshooting and safety tracking.



Recipes Screen – Pre-Programmed

The PLC includes five built-in pumpdown “recipes” designed for different roughing and turbopump configurations. Each sequence is managed by its own state machine for consistent, repeatable results. Recipes include:

- RV → Turbopump
- mXDS → Turbopump
- RV Bypass
- mXDS Bypass
- RV Roughing + Turbo backed by mXDS

Additional recipes can be custom-programmed upon request.

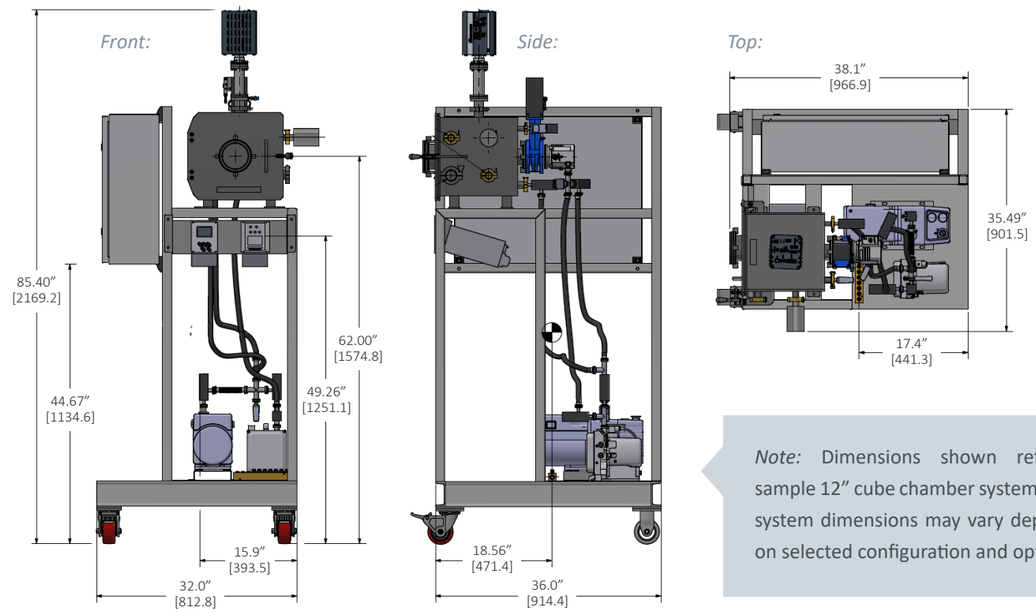
SPECIFICATIONS

Vacuum performance is process dependant. Using tools like ***PumpCalc***, our team can generate pumpdown curves tailored to your system configuration, giving you a realistic understanding of expected performance for your process.

Need help selecting the right options? Our vacuum experts are here to guide you every step of the way.

Category	High Vacuum System	Ultra-High Vacuum System
Operating Pressure	760 to ≤7.5×10^{-7} Torr (1000 to ≤1×10^{-6} mbar)	760 to ≤7.5×10^{-10} Torr (1000 to ≤1×10^{-9} mbar)
Base Pressure	≤7.5×10^{-7} Torr (≤1×10^{-6} mbar) with Turbopump	≤7.5×10^{-10} Torr (≤1×10^{-9}mbar) with Capture Pump + Turbopump
Primary Pumps	RV, mXDS, nXDS, or nXRi	Oil-free pumps only (mXDS, nXDS, or nXRi)
Turbopumps	nEXT55 to nEXT400	nEXT55 to nEXT400
Capture Pumps	Optional	Required: Ion Pump, NEG, TSP, and/or HyTan
Chamber Material	304L Stainless Steel	304L Stainless Steel, UHV Cleaned, Electropolished
Bakeout Options	Optional IR heaters (LIR)	Recommended for UHV: IR or resistive heating
Control Options	Manual, TIC, or PLC + HMI	Same
Operating Temp Range	54–104°F (12–40°C) based on pump specs	54–95°F (2–35°C) – limit outgassing, sensitive components
Approx. System Weight	350–550 lbs (160–250 kg) depending on build	400–600 lbs (180–270 kg) with UHV components
Frame Design	Caster-mounted welded steel	Same
Utilities Required	120 VAC 1Φ, 50/60 Hz; 6–8 bar compressed air, optional LN_2 feed line or chiller	Same

Note: Final system specifications depend on your selected configuration and options.



Note: Dimensions shown reflect a sample 12” cube chamber system. Actual system dimensions may vary depending on selected configuration and options.

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