

NEW PRODUCTS

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LAWRENCE G. RUBIN

FOCUS ON VACUUM TECHNOLOGY

Cold-Cathode Gauge Controller

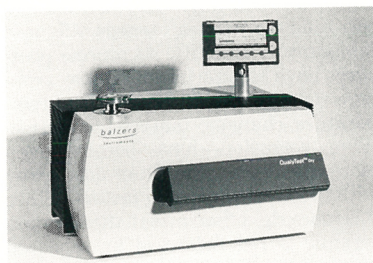
The Vacuum Products Group of MKS Instruments has introduced the HPS series 943 cold-cathode gauge controller. It will operate the HPS series 423 I-Mag gauge or the 421 cold-cathode gauge with a measurement range of 10^{-2} to 10^{-14} torr. The controller includes an LED digital readout, two adjustable set points with LEDs, high-voltage protection and analog output. Measurements can be taken in torr, millibars or pascals.

HPS cold-cathode gauges are inverted magnetron sensors. The design includes an isolated collector, which makes the sensor less susceptible to contamination and allows a wider range of pressure measurements. The 421 cold-cathode gauge has a high operating temperature, requires no adjustment in emission current, has no filaments to burn out and does not need to be degassed. The 423 is smaller and less expensive. *Vacuum Products Group, MKS Instruments, 5330 Sterling Drive, Boulder, Colorado 80301*
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Helium Leak Detector

The QualyTest helium leak detector from Pfeiffer Vacuum Technology features an all-steel construction and is claimed to provide easy-to-learn operation. Its low, streamlined profile prevents accidental tip-over, while the menu-driven remote can withstand being dropped.

The QualyTest twin-flow design permits a high inlet pressure of 25 millibar and a pumping speed of 2.1 L/s, resulting in fast recovery for short test times. The instrument can detect small leaks with a detection limit of 5×10^{-12} millibar L/s. The unit is



ready for use three minutes after startup, and remote operation and display are possible up to 100 m away.

Three versions of the detector are available. The QualyTest Dry is best suited for clean applications, the QualyTest Standard for general vacuum applications and the QualyTest Select for economical leak detection using an existing vacuum pump. *Pfeiffer Vacuum Technology, 24 Trafalgar Square, Nashua, New Hampshire 03063-1988*
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Rotary Motion into Vacuum

Many high- and ultrahigh-vacuum applications require rotary motion to be transferred through the vacuum vessel wall. When the vacuum requirements exceed the simple, dynamic O-ring seal, the common shaft seal is a suspension of magnetic particles in low vapor pressure fluid, held in place by magnets. For ultrahigh-vacuum conditions, the shaft does not penetrate the vacuum wall but is sealed inside a flexible metal bellows; however, the sealing mechanisms can fail. Kurt J. Lesker's MagiDrive is a rotary motion device in which the shaft is enclosed by a stainless steel vacuum casing, without O rings, bellows or fluids.

The seal can be scaled to any size, and the device is stackable—that is,

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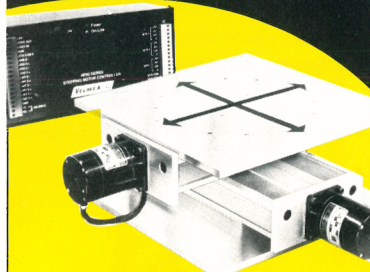
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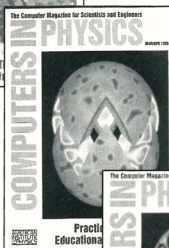
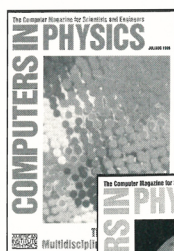
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drives of various sizes can be mounted end-to-end, using conventional copper gasket-sealed flanges—and can be baked to 230 °C for UHV operation. *Kurt J. Lesker Company, 1515 Worthington Avenue, Clairton, Pennsylvania 15025*

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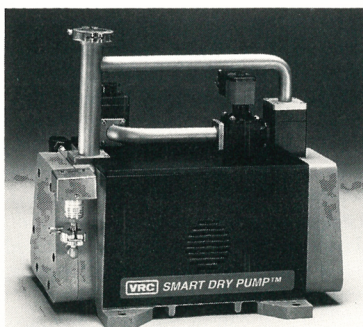
Capacitance Diaphragm Gauge

Leybold Inficon's Titan capacitance diaphragm gauge (CDG) uses an ultrapure aluminum oxide ceramic diaphragm that is said to eliminate the weaknesses of conventional metal diaphragms, thus improving consistency, corrosion resistance, sensor life and temperature stability. As process pressures have become lower, the key problems of any metal—stretching, temperature changes, material imperfections, corrosion—have become even more apparent. The Titan does away with these error-causing factors. Since it is more rigid than metal, the alumina ceramic is not deformed by repeated pressure cycling or overpressure. Not even small temperature changes affect the Titan diaphragm, so zero drift, which can dramatically alter CDG accuracy, is only 0.005% of full scale per °C—eight times better than the Inconel stainless steel used for most CDGs. *Leybold Inficon, Two Technology Place, East Syracuse, New York 13057*

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Dry Pumps for Roughing

Vacuum Research Corp introduces its Smart Dry Pump for roughing of ion or cryogenic pumps and backing of turbo pumps. It is said to provide the reliability of piston-style pumps at lower cost and with a smaller footprint. The pumping speed is 8 L/s per minute and can operate for 20 000 hours with no maintenance.



The Smart Pump needs no cooling water or purge gas, and there is no oil or pump fluid to monitor or dispose of. The pistons operate in parallel from 1 atmosphere to 1 torr and then automatically switch to series operation to reach 20 mtorr; this design enables high capacity and low ultimate pressure. The crossover is controlled with the company's Pirani gauge vacuum switch. *Vacuum Research Corporation, 2419 Smallman Street, Pittsburgh, Pennsylvania 15222*

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Argon Leak Detector

Veeco Instruments announces the MS-50 argon console leak detector, said to be the only fully automatic argon console leak detector in the industry. The reliable and easy-to-use leak detector is designed for applications that are too permeable for helium. The use of the company's dual-sector mass spectrometer tube enables high resolution and accuracy. The MS-50 provides less than 1×10^{-8} cm³/s (stp) ultimate sensitivity, automatic calibration check, calibration and tuning, 50 programmable test recipes, resolution of 40 at mass 40 (argon) and an internal temperature-compensated argon-calibrated leak standard traceable to NIST.

The leak detector's interactive cathode-ray tube displays on its screen information needed by the operator. *Veeco Instruments, Terminal Drive, Plainview, New York 11803*

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Vacuum Measurement System

Granville-Phillips has introduced the series 375 Convection vacuum measurement system, a new vacuum gauge system that is said to offer the stable and accurate fast-response pressure measurement of the industry-standard Convection gauge. The new controller is compatible with existing Convection gauges and measures pressure from 1000 torr to 1×10^{-4} torr. The rugged all-metal package is immune to radio-frequency interference, and its 1/8 DIN size occupies half the panel space of older controllers. The system is protected by a five-year warranty. Options include process control set points and RS-232 and RS-485/422 digital interfaces. *Granville-Phillips, 5675 Arapahoe Avenue, Boulder, Colorado 80303*

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Vacuum Blower

Stokes Vacuum has introduced the model 615HSBP, a higher-speed version of its dry lobe vacuum blower, designed for use with mechanical fore-pumps. At 3600 rpm, the new model produces a pumping speed of 1300 L/s. It also includes an automatic bypass valve to maintain a constant differential pressure and enables the blower to start from atmosphere, providing effective use over the full pressure range. Depending on the pressure differential, the bypass valve can decrease the pump-down time by 5% to more than 50% compared to non-bypass blowers with equal capacity. The unit's high-speed pumping efficiency is also said to be better than that of blowers that rely on pressure switches.

The model 615HSBP blower maintains a constant horsepower draw on the motor, which may prevent motor overload and decreases the likelihood of premature motor failure. *Stokes Vacuum, 5500 Tabor Road, Philadelphia, Pennsylvania 19120*

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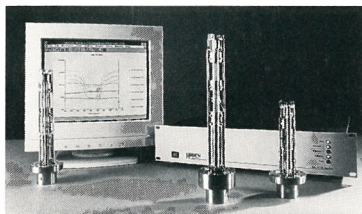
Vacuum Pump Oil-Filtration System

MV Products's portable, self-contained vacuum pump oil-filtration system attaches to the oil fill and drain ports of a pump to remove acids, alkalis, moisture, particles and other corrosive or contaminating materials and thereby prolong pump and fluid life. The MV VisiFlow system features a positive-displacement gear pump, quick-disconnect hoses and two clear-plastic sumps for visually monitoring the condition of the filter elements and pump fluid. The system provides a 4 liter-per-minute continuous flow rate, and its inlet and exhaust pressure gauges indicate efficiency. Users can select from three filter materials. *MV Products, 247 Rangeway Road, P.O. Box 359, North Billerica, Massachusetts 01862-0359*

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Residual Gas Analyzers

Hidden Analytical announces the HAL-RC series of residual gas analyzers (RGA) for use in vacuum diagnostics. These systems include a range of quadrupoles and detector options and provide a minimum detectable partial pressure of 5×10^{-14} mbar and maximum operating pressure of 1×10^{-4} mbar. Ion source options include a



platinum version for minimal outgassing and reduced electron-stimulated desorption in UHV environments.

All HAL-RC instruments operate under Windows MASoft PC. The Scan Gallery provides easy access to the primary RGA operations, including vacuum fingerprinting, leak detection and multiple ion detection for real-time trend analysis of complex gas mixtures. *Hidden Analytical, 420 Europa Boulevard, Warrington WA5 5UN, UK*

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New Literature

The VAT Vacuum Valves 2000 Catalog is a 192-page hardcover sourcebook that provides complete technical specifications for vacuum valves, control systems and accessories for applications ranging from rough vacuum to UHV. New products include miniature gate valves, low-cost all-metal angle valves, heated valves, custom integrated OEM valves and retrofit valves. *VAT, 500 West Cummings Park, Woburn, Massachusetts 01801*

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A 600-page vacuum products catalog from Varian includes sections describing the company's lines of primary, diffusion, ion and turbomolecular pumps; leak detectors; turbo pumping systems; instruments (including gauge controllers and transducers); components (including valves, flanges, fittings and feedthroughs); supplies; and customized products. *Varian Vacuum Products, 121 Hartwell Avenue, Lexington, Massachusetts 02173-3133*

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The senior engineering staff of Queensgate Instruments has written the *NanoPositioning Book*, which describes the performance parameters of devices for moving and measuring with nanometer precision. For comparison, the separation of atoms in silicon is about 0.2 nm. *Queensgate Instruments, Suite 600, 90 Merrick Avenue, East Meadow, New York 11554*

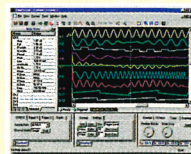
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