New Products

The descriptions of the new products listed in this section are based on information supplied to us by the manufacturers. PHYSICS TODAY can assume no responsibility for their accuracy. To facilitate inquiries about a particular product, a Reader Service Card is attached inside the back cover of the magazine.

Lawrence G. Rubin

Focus on Vacuum and Cryogenics

Helium Leak Detectors

Alcatel has introduced the Adixen ASM 182/192 series of helium leak detectors. The new series features the company's magnetic deflection 180-degrees analyzer and amplification system that provides a sensitivity of 5×10^{-12} atm.cc/s helium minimum detectable leak. The compact model ASM 182 T can be installed on a cart and is equipped with a 20-m^3/h (15 cfm) oil-sealed roughing/backing pump and a 130-L/s hybrid turbo pump. The console model ASM 192 T can be supplied with one or two 20-m^3/h rotary pumps (to double the roughing capacity); the ASM 192 T2 incorporates the two roughing pumps plus a booster turbo molecular pump (100 L/s). These conventional leak detectors are complemented by dry versions using the company's frictionless multistage dry pump model ACP 28 (models ASM 182 TD+, 192 TD+, and 192 T2D+). *Alcatel Vacuum Technology, 67 Sharp Street, Hingham, MA 02043, http://www.adixen.com*

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Temperature Cycling Tester

FTS Systems has announced the AirJet XE benchtop temperature cycling tester that uses a mechanically refrigerated system to control the temperature of a clean, dry air stream, eliminating the need for liquid nitrogen or other external temperature source. The AirJet XE has a temperature range of –75°C to +225°C and cycles from –55°C to +175°C in less than 10 s and from +175°C to –55°C in less than 35 s. The temperature control system incorporates proportional-integral-derivative control with a resolution of 0.1°C and a repeatability of ±0.5°C. Other features include a programmable ramp/soak function and compatibility with automatic test equipment using GPIB or RS232 interfaces. Airflow rates are adjustable from 1 to 6 SCFM; an optional air dryer allows use of a house compressed-air supply. *FTS Systems Inc, 3538 Main Street, P.O. Box 158, Stone Ridge, NY 12484, http://www.ftssystems.com*

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Turbo Pumps

The TPH 1201 and TPH 2303 turbo pumps from Pfeiffer Vacuum enhance high-density plasma-chemical vapor deposition and atomic layer deposition semiconductor processes. Both pumps are standard turbo pumps without drag stages that can get clogged with particulates. Both feature an advanced rotor design to improve the pumping performance and allow for backing pressures in the millibar range. The TPH 1201 provides a pumping capacity of 1200 L/s for nitrogen and argon throughput of 22 mbar L/s. The TPH 2303 offers reportedly the best combination of hydrogen pumping at 1900 L/s and heavy gas throughput at 50 mbar L/s for N_2. The pumps' integrated controller permits simple cable connections to peripheral devices that control venting, interlocking backing-pump and control, and temperature management functions. *Pfeiffer Vacuum Inc, 24 Trafalgar Square, Nashua, NH 03063-1988, http://www.pfeiffer-vacuum.com*

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Motors for Cryogenic Operation

Empire Magnetics has developed a Cryogenic Series of brushless servo motors with resolver feedback. Available in standard size 23 (other sizes are available), these motors have been engineered for motion control applications at extremely low temperatures, such as liquid oxygen pumping, superconductor research, IR sensor testing, and satellite and antenna controls. The cryogenic motors have been tested for reliable operation at temperatures as low as 20 K and can potentially operate at even lower temperatures. They are constructed with special dry lubrication and exotic chromium-nickel-steel alloy components for compatible thermal expansion characteristics and reduced brittleness. Insulation materials are made of selected polymers to reduce outgassing at low temperatures. *Empire Magnetics Inc, 5780-B LaBath Avenue, P.O. Box 1908, Rohnert Park, CA 94928, http://www.empiremagnetics.com*

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Convection Vacuum Gauges

InstruTech has introduced the CVG vacuum gauge and CVM module as direct drop-in, plug-compatible replacements for the Granville-Phillips/Helix Technology (G-P) Convectron gauge and Mini-Convectron module, respectively. InstruTech's model CVG-101 Worker Bee is a redesigned version of the Convectron that provides equivalent or better performance throughout the pressure range of 10^{-4} to 1000 torr. The internal surface area of the gauge has been increased by almost 75%, improving the response time of the gauge to lower pressures. Temperature compensation has been removed from the vacuum environment, reducing costs and improving performance. The company's CVM-201 Yellow Jacket module, which includes an internal gauge, directly replaces most of the many configurations of the G-P Mini-Convectron modules. *InstruTech Inc, 1401 Ken Pratt Boulevard, Longmont, CO 80501, http://www.instrutechinc.com*

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Vacuum Chambers

The Kurt J. Lesker Co has extended its line of standard vacuum chambers to include several new box and spherical designs. Spherical chambers consist of

two hemispheres welded circumferentially, with knife-edged (Conflat style) flanges. These chambers, which can routinely reach pressures in the 10^{-10} torr range, are offered in 30-cm and 45.7-cm i.d. sizes. The center lines of instruments attached to a chamber's ports (see photo) cross at a center point, allowing the instruments to interact with each other or with a sample surface.

Box chambers come in two sizes with internal dimensions of 30 cm × 30 cm × 60 cm and 60 cm × 60 cm × 60 cm. These chambers, which can reach pressures in the 10^{-7} torr range, have an entry door that extends the full length and width of the chamber. *Kurt J. Lesker Company, 1515 Worthington Avenue, Clairton, PA 15025-2700, http://www.lesker.com*

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Acoustic Stirling Cryocooler

CFIC/Qdrive's line of unitary cryocoolers offers nonwearing, oil-free, low-noise, low-vibration cooling in applications such as medical gas liquefaction to superconductivity studies. Each of the five models has a displacerless, Stirling "thermoacoustic pulse-tube" cryocooler with a balanced, dual-opposed-piston drive. The first production model, the 2S102K, is a compact (9-kg) desktop device that provides 8 W of cooling at 77 K and can produce temperatures as low as 40 K. It uses a U-tube cold-head design, making it smaller and more adaptable to custom cold loads, such as electronic elements and miniature liquid dewars. The 2S102K can operate in any orientation and is available with water cooling or air cooling. Qdrive cryocoolers are driven by the company's TwinSTAR pressure wave generators. *CFIC/Qdrive Inc, 302 10th Street, Troy, NY, 12180, http://www.qdrive.com*

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Vacuum Inlet Trap

MV Products has announced the MV Visi-Trap Vacuum Inlet Trap, designed to prevent pump failures and eliminate the need for frequent pump rebuilds by trapping foreign material entering vacuum pumps up to 20 cfm capacity. A transparent sump shows when to change the filter insert, which can be done without removing the Visi-Trap from the vacuum system. Users can select from a wide variety of replacement filter cartridges for trapping particles, acids, solvents, and water vapor. Filter types include copper gauze, stainless steel gauze, molecular sieve, activated charcoal, activated alumina, and Sodasorb. The MV Visi-Trap is available in 7.9- and 12.8-inch heights and is supplied with a vent valve, dial gauge assembly, and various port terminations. *MV Products, Division of Mass-Vac Inc, 247 Rangeway Road, P.O. Box 359, North Billerica, MA 01862, http://www.massvac.com*

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Cryogenic Probers

SUSS MicroTec has introduced a semiautomatic cryogenic prober system for condensation-free probing to 77 K with liquid nitrogen or to 20 K with liquid helium. The PAC 200/300 was designed to test 300-mm diameter wafers but can also test 200-mm diameter wafers and smaller substrates. The prober has two separate cooling cycles, one for the SUSS triaxial CryoChuck and one for the SUSS CryoShield. This configuration

speeds up the automatic cooling process. The cryogenic probe card used for the test is indirectly cooled via the shield to prevent heat flow to the device under test. The card allows probing with up to 80 needles made of tungsten, tungsten/rhenium, or copper/beryllium (with coaxial cabling). The system can be field-upgraded with as many as 8 probe heads. *SUSS MicroTec Inc, 228 Suss Drive, Waterbury Center, VT 05677-0157, http://www.suss.com*

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Actuator for Vacuum Applications

New Focus has released the model 8310-V, a vacuum-compatible (to 10^{-6} torr) version of its closed-loop Picomotor actuator. Designed for applications that require closed-loop control and absolute position calibration in a low-outgassing environment, the 8310-V incorporates an integrated rotary encoder and home, forward, and reverse limit switches. It provides better than 30-nm resolution, more than 22 N of force, and ± 1-μm bidirectional repeatability over the entire 12.7-mm travel range. The new actuator has a lifetime of 15 000 cycles as measured over a 2-mm round trip travel with a 5-pound load. The company's model 8751-C Intelligent closed-loop Picomotor driver can be used to control one or more of the 8310-V Picomotor actuators, both standard and closed-loop models. *New Focus, Division of Bookham Technology, 2584 Junction Avenue, San Jose, CA 95134, http://www.newfocus.com*

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Optical Mounts for Vacuum

Space Optics Research Labs (SORL) now supplies optical mounts for large mirrors for use in vacuum environments (down to 10^{-6} torr). The vacuum mounts can be provided with SORL aspheric mirrors or as standalone components. The mounts feature adjustment of orthogonal tip-tilt and height of optical axis. Both coarse and fine adjustments can be made, and locking screws are included. An alignment flat can be mounted to speed and ease interferometric alignment of aspheric optics. Aspheric mirrors provide better image quality and best collimation in applications with a narrow field of view. Mirrors can be mounted and aligned into their mounts if required. Wavefront accuracy of $\lambda/20$ is available; optics up to 40-inch o.d. and convex or concave masters can be produced. *Space Optics Research Labs, 7 Stuart Road, Chelmsford, MA 01824, http://www.sorl.com*

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In-Situ Etching System

MBE-Komponenten has announced the ISES, a fully UHV- and MBE-compatible gas source for high-vapor pressure materials like arsenic tribromide, used for in-situ etching applications. That process allows atomic-layer-precise manipulation of thin films and nanostructures. The use of $AsBr_3$ as the etchant species without any carrier gas guarantees full compatibility with all standard III-V-MBE systems. The ISES is a standalone system that requires only a free DN40 CF flange for the gas injector unit to connect to the MBE system. The solid-state (or liquid) etchant material is stored and evaporated in a gas cabinet that also includes a mass-flow controller for vapor flow control and its own UHV system for evacuating the gas system. *MBE-Komponenten GmbH, Gutenbergstrasse 8, 71263 Weil der Stadt, Germany, http://www.mbe-komponents.com*

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Miniature Piezoelectric Pumps

Clark Solutions has introduced the Deak Technologies models DTI-200P-12P (polycarbonate pump housing) and DTI-200-12A (aluminum pump housing) miniature piezoelectric pumps for a wide range of liquid and gas pumping applications. Using piezoelectric crystals formed and bonded in a metal diaphragm, the pumps operate when the bonded crystals are stressed and distorted by an electric field, causing the diaphragm to flex. Because there are no electric motors, the pumps are quiet, consume only 150 mW of power, and are free of electromagnetic noise. They deliver flow rates of 0 to 200 mL/min of water and 0 to 7.5 SCFH of air and operate at pressures of up to 12.5 psi. The piezoelectric pumps are ideal for simple fluid transfer and portable and fixed cooling applications. *Clark Solutions, 10 Brent Drive, Hudson, MA 01749, http://www.clarksol.com*

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Regulator System

The model 8404L Liquid ChangeOver Regulator system from Scott Specialty Gases provides continuous flow of specialty gases by directing flow from two separate dewars (or banks) to the point of use. The system combines a pressure-reducing regulator with high-purity diaphragm valves to direct the flow of gas so that when one source empties, the system automatically draws from the other one. The model 8404L is designed for use with dewars that have safety relief-valve settings of 230, 350, or 500 psig, and is available with either nickel-plated brass or 316L body materials. Delivery pressure is adjustable from 10 to 150 psig; a purge vent is located to the rear of the unit. Check valves prevent discharge of gas from manifolds and pigtails when containers are being changed. *Scott Specialty Gases, 6141 Easton Road, P.O. Box 310, Plumsteadville, PA 18949, http://www.scottgas.com*

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New Literature

MDC Vacuum Products has published a 528-page catalog of building blocks for vacuum science and technology that details the company's expanded line of high- and ultrahigh-vacuum components. New products include the Del-Flex process line and stainless steel flexible hoses. *MDC Vacuum Products Corporation, 23842 Cabot Boulevard, Hayward, CA 94545-1661, http://www.mdc-vacuum.com*

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Coating and vacuum supplies are featured in a 2004 catalog from Fil-Tech. Included are details on the company's stress-relieving alloy quartz crystals, along with cross-reference information on replacement parts for electron-beam and ion-source systems. *Fil-Tech Inc, 6 Pinckney Street, Boston, MA 02114, http://www.filtech.com*

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Teledyne Hastings Instruments' new eight-panel product review brochure offers significant design features and specifications for all of the company's flow and vacuum instruments, including the new IGE-3000 ion gauge and THPS-400 four-channel power supply, display, and totalizer. *Teledyne Hastings Instruments, P.O. Box 1436, Hampton, VA 23661, http://www.teledyne-hi.com* ■

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