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. For more information about a particular product, visit the website at the end of the product description.

Lawrence G. Rubin

Focus on Vacuum and Cryogenics

High-Temperature Pressure Manometer

MKS Instruments has introduced the Type 631B high-temperature Baratron capacitance manometer for pressure measurement in difficult semiconductor and biopharmaceutical applications in which condensable byproducts exist. The device operates at very high internal temperatures (150 °C or 200 °C) to minimize the deposition of process byproducts within the sensor, and this nearly eliminates output drift caused by such contamination. The 631B's self-contained electronics require only ±15 VDC input power. The all-Inconel capacitance sensor provides superior protection against corrosive process environments and its overpressure rating of 45 psia ensures good repeatability and stability, regardless of process conditions. The Type 632B adds an internally-mounted trip relay function. *MKS Instruments Inc, 90 Industrial Way, Wilmington, MA 01887, http://www.mksinst.com*

See www.pt.ims.ca/6088-131

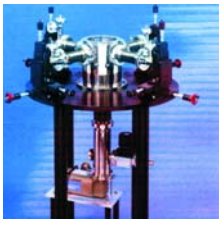
Workstation Leak Detector

The Adixen ASM 1002 leak detector from Alcatel Vacuum Products can test small components in a mass production environment. It can achieve 1×10^{-9} mbar L/s, leak-testing sealed packages in less than 4 seconds (single or batch testing), and is fully automated. As soon as the test chamber is closed, the cycle starts. The powerful pumping system—a 15- to 30-cfm roughing pump associated with a 200-L/s hybrid turbo pump—evacuates the test chamber and allows the unit to perform the leak tests quickly and accurately. For open packages, a second leak-test software program will keep the ASM 1002 in test mode as long as needed to allow the operator to perform the test; the end of the test will be triggered by the operator. The test chamber can be easily removed and any fixture installed to enable the leak test of any size hybrid circuits. *Alcatel Vacuum Products, 67 Sharp Street, Hingham, MA 02043, http://www.adixen.com*

See www.pt.ims.ca/6088-132

Cryogen-Free Probe System

Janis Research Co has announced cryogen-free micro-manipulated probe systems that incorporate Gifford-McMahon mechanical coolers (4-K, 7-K, and 10-K models) decoupled from the cold stages and probes. These systems are for use in facilities that do not have access to liquid cryogens. They are supplied with integrated vibration-isolation tables and automatic temperature controllers for operation up to 300 or 450 K, and are available with stereo-zoom or standard microscopes and turbomolecular pumping stations that are integrated with the probe system. Tests have indicated a vibration amplitude of less than 1 μm at the sample and probes, and the microscope, which is supported on the same frame, was able to maintain its 1.5-μm resolution on the sample surface. *Janis Research Company Inc, 2 Jewel Drive, P. O. Box 696, Wilmington, MA 01887-0696, http://www.janis.com*



See www.pt.ims.ca/6088-133

High-Vacuum Diffusers

Key High Vacuum Products has released the DF series diffusers, designed to quickly introduce large quantities of gas into a vacuum chamber or load-lock during the venting of a process. The diffusers break up the incoming gas stream evenly and uniformly and thus reduce cycle time. The fittings are constructed of 304L and 316L stainless steel and are manufactured to a high finish and electropolished. They use standard Viton elastomer seals, operate up to 120 °C, and can withstand a maximum inlet pressure of 30 psi. The DF series features standard ISO interfaces (sizes from NW 10 to NW 50) that allow the use of bulkhead clamps with a chamber. The 10 models offer flow rates ranging from 450 to 9000 sccm and include a ¼-inch VCR male or female fitting. *Key High Vacuum Products Inc, 36 Southern Boulevard, Nesconset, NY 11767, http://www.keyhigh.com*

See www.pt.ims.ca/6088-134

Vacuum Engineering Software

VECOR's VacMaster 2.0 software is a new tool used to calculate and analyze the pumping performance of laboratory and industrial vacuum systems. It offers a database for vacuum chamber materials and vacuum pumps, including mechanical, Roots, diffusion, turbomolecular, and cryogenic pumps and pumping systems. The software allows for analysis of different types of vacuum chambers including bell jar, cylindrical, box, spherical, and others. VacMaster 2.0 provides two pumping modes. One is a roughing mode that prompts the user to enter the roughing pipe diameter, length, and number of bends. For a high-vacuum pumping mode, the software takes into account a gas load and enables users to design a system that may include nipples, elbows, gate valves, baffles, and a conductance controller. Project and report results are saved in various files. *VECOR, 101 Duranzo Aisle, Irvine, CA 92606, http://www.vecorus.com*

See www.pt.ims.ca/6088-135

High-Throughput Turbo Pumps

Pfeiffer Vacuum has introduced the series TPH high-capacity, high-throughput turbo pumps designed for high-particulate processes in semi-

conductor, glass, industrial coating, and research and development applications. The four models in the company's CompactTurbo series are characterized by high pumping speeds of 1000–2000 L/s for light gases such as hydrogen and helium, and high throughput (up to 2 standard liters per minute) for heavy gases, including nitrogen, argon, and carbon tetrafluoride. The company's proven rotor-and-bearing design eliminates the need for additional drag stages and provides superior reliability with a mean time before failure of better than 200 000 hours. Each of the four models is available in versions to handle corrosive gases and with an integral power supply. *Pfeiffer Vacuum Inc, 24 Trafalgar Square, Nashua, NH 03063-1988, http://www.pfeiffer-vacuum.com*

See www.pt.ims.ca/6088-136

Residual Gas Analyzer

The Qulee quadrupole mass spectrometer from ULVAC Technologies is useful for leak detection and system monitoring, and for RGA analysis and process-gas monitoring in various vapor deposition systems. A one-touch control screen displays the partial-pressure readout in pascals of helium, water, nitrogen, oxygen, O_2 to N_2 ratio, and a user-selectable channel from 1 to 50 amu. The minimum detectable partial pressure is 1×10^{-10} Pa. A maximum operating pressure of 2 Pa can eliminate the need for differential pumping. The Qulee features a removable front-end electronics package that permits easy replacement of the quadrupole gauge, which, when removed, enables the gauge head to be baked at temperatures of up to 250 °C. The instrument is designed primarily for end users, but is also suitable for OEM use. *ULVAC Technologies Inc, 401 Griffin Brook Drive, Methuen, MA 01844, http://www.ulvac.com*

See www.pt.ims.ca/6088-137

Power Supplies for Vacuum Applications

The Kurt J. Lesker Co has developed a family of M.A.P.S. power supplies for applications that involve heating and evaporation in a vacuum environment. Each of the four units in the series has AC outputs. The model EVP is normally used in conjunction with a step-down transformer to provide high-current, low-voltage control of most thermal evaporation sources using a manual output control. The HTR model temperature controller/power supply is for use with high-vacuum and ultrahigh-vacuum sample heaters and other resistive heating elements; both the EVP and HTR are available with output powers from 2 to 8 kW. The HTE and LTE temperature controller/power supplies are for high-temperature thermal evaporation of metals and inorganic materials and low-temperature thermal evaporation, respectively. *Kurt J. Lesker Company, 1925 Worthington Avenue, Clairton, PA 15025-2700, http://www.lesker.com*

See www.pt.ims.ca/6088-138

Compact Dilution Refrigerator

Oxford Instruments Superconductivity and Quantum Design have launched a jointly developed compact dilution refrigerator (DR). The model P850 is a continuously circulating helium-3/helium-4 system designed to be installed in the sample space of Quantum Design's PPMS apparatus and to extend the minimum experimental temperature to 50 mK. The DR option can be ordered with a new PPMS or as an upgrade to existing systems. Valveless control of the P850 is achieved by using a specially designed turbo pumping unit in which the pump and its controller function together as a virtual gate valve. Varying the speed of the pump controls the circulation rate of the gas mixture. This technique also accommodates changes in the He vapor pressure in the pumping lines. *Oxford Instruments Superconductivity,*

Abingdon, OX13 5QX, UK, http://www.oxford-instruments.com
See www.pt.ims.ca/6088-139

Software for Residual Gas Analyzers

Stanford Research Systems has released version 3 of the RGA Windows Software used to control and acquire data from the company's residual gas analyzers. The new version is a 32-bit application, featuring true multithreaded support, which enables the user to run other tasks while taking data from the RGA head. A new tuning-menu item has been added that allows the user to tune the software to display rates in the Leak mode. The Analyze mode can be customized using the Analyze Settings option. The revamped user interface has new features including automatic detection of all RGAs connected to the user's computer, a dummy RGA for testing or simulation, live settings controls to change settings on the fly, and preferred screen layouts that can now be saved as default. The actual data storage is limited only by the size of the user's hard drive. *Stanford Research Systems, 1290-D Reamwood Avenue, Sunnyvale, CA 94089, http://www.thinksrs.com*
See www.pt.ims.ca/6088-140

Immersion Cooler

The FT series immersion coolers from JULABO USA are an easy and economical alternative to dry ice. They are also used for cooling tasks in combination with heating circulators and baths to achieve subambient temperatures or to replace tap water cooling. The coolers in this series include five models with temperature ranges that go as low as –90 °C and cooling capacities of up to 450 W. Model FT200 has a temperature range from –20 to +30 °C; FT400, from –40 to +30 °C; and FT900, from –90 to +30 °C. Models FT402 and FT902 include a controller with an LED display for temperature indication and control, and demonstrate a temperature stability of ±0.5 °C and ±1.0 °C, respectively, using an external Pt100 sensor. All units are equipped with carrying handles or casters. *JULABO USA, 754 Roble Road, Allentown, PA 18109, http://www.julabo.com*
See www.pt.ims.ca/6088-141

Metrology Well Calibrators

Hart Scientific has announced a new product category: Metrology Wells, designed for calibrating a variety of thermometers and temperature sensors and extending laboratory performance to the field. Two of the four new 917X models extend to a temperature range below 0 °C. The 9170 covers the range –45 to 140 °C; the 9171, the range –30 to 155 °C; the 9172, 35 to 425 °C; and the 9173, 50 to 700 °C. All of the calibrators offer temperature stability to ±0.005 °C, axial (vertical) uniformity to ±0.02 °C, radial (well-to-well) uniformity to ±0.01 °C, built-in reference accuracy to ±0.006 °C, error from loading to ±0.005 °C, hysteresis to ±0.025 °C, and immersion depth to 203 mm. An optional ITS-90 reference input reads platinum resistance thermometers to ±0.006 °C. *Hart Scientific, division of Fluke Corp, 799 East Utah Valley Drive, American Fork, UT 84003-9775, http://www.hartscientific.com*
See www.pt.ims.ca/6088-142

Thermally Conductive Adhesive

Master Bond has developed EP21TCHT-1, a two-component, thermally conductive, electrically insulating epoxy adhesive with a service operating range of 4 K up to 200 °C. It is formulated to cure at room temperature or more rapidly at elevated temperatures. Since the adhesive passes NASA low-outgassing specifications, it is ideal for high-vacuum applications, particularly those in which elevated temperature cures are not possible. The EP21TCHT-1 is physically strong and adheres extremely well to metals, glass, wood, vulcanized rubbers, and most plastics. It exhibits resistance to thermal cycling and can withstand exposure to water, fuels, and most organic solvents. The adhesive is 100% reactive and does not contain any solvents or diluents. *Master Bond Inc, 154 Hobart Street, Hackensack, NJ 07601-3922, http://www.masterbond.com*
See www.pt.ims.ca/6088-143

Low-Pressure Switching Monitor

Precision Sensors has introduced the LPS low-pressure switching monitor for measuring differential pressure while preventing unnecessary shutdowns. The monitor uses two independently set switch points for alarm warning and/or shutdown. An LED display indicates when the sensed pressure limit is exceeded and signals an alarm. An adjustable standalone time delay prevents intermittent tripping that results from brief transient upsets. The LPS has a 0–10 VDC or 4–20 mA analog output, available in eight ranges from 50 Pa to 50 kPa, and with an accuracy of ±1% of full scale at 20 °C; compound ranges can be provided. The high/low alarm contacts are isolated, latching types (optional nonlatching available). *Precision Sensors, division of United Electric Controls, 50 Seemans Lane, Milford, CT 06460, http://www.precisionsensors.com*
See www.pt.ims.ca/6088-144

New Literature

A 40th-anniversary catalog is available from A&N Corp. It includes such high- and ultrahigh-vacuum components as flanges and fittings, couplings, viewports, feedthroughs, valves, leak-detector accessories, weldable components, chambers, and hybrid adapters. *A&N Corp, 707 Southwest 19th Avenue, Williston, FL 32696, http://www.ancorp.com*
See www.pt.ims.ca/6088-145

MadgeTech has published the Data Logger catalog that includes a broad line of instruments for recording temperature, humidity, pressure, voltage and current, strain, level, pH, shock and vibration, weather, and combinations of these, all at adjustable reading rates. Accessories for wireless operation are also listed. *MadgeTech Inc, P. O. Box 50, 201 Route 103 West, Warner, NH 03278, http://www.madgetech.com*
See www.pt.ims.ca/6088-146

Keithley Instruments has released a tutorial CD, *Interactive Test & Measurement Troubleshooting Guide*. Users can explore the symptoms and causes of errors associated with low-level signals such as low voltage, low current, and low resistance, and with high resistance and voltage from a high-resistance source measurement. *Keithley Instruments Inc, 28775 Aurora Road, Cleveland, OH 44139-1891, http://www.keithley.com/pr/018*
See www.pt.ims.ca/6088-147 ■