

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 TECHNOLOGY AND CRYOGENICS

Closed-Loop Gas Chiller

IGC Polycold Systems has introduced the PGCL series of closed-loop, low-temperature gas chillers, used for low-temperature vacuum processing of semiconductor device wafers and for other applications. The PGCL system consists of a closed-loop refrigerator system, which uses a blend of environmentally compliant mixed refrigerants to chill the secondary gas. The system also has a secondary gas recirculating compressor, interconnecting gas lines, and a table in the vacuum system. The temperature of the gas leaving the chiller can reach temperatures as low as -76°C . An inert dry gas such as nitrogen, argon, helium, or dry air can be used as the coolant in the secondary loop; there is no mixing of the refrigerant and the secondary gas. Two models of the PGCL are offered: 400- and 800-W cooling. *IGC Polycold Systems Inc, 3800 Lakeville Highway, Petaluma, California 94954, <http://www.polycold.com>*

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Screw-Type Dry Vacuum Pump

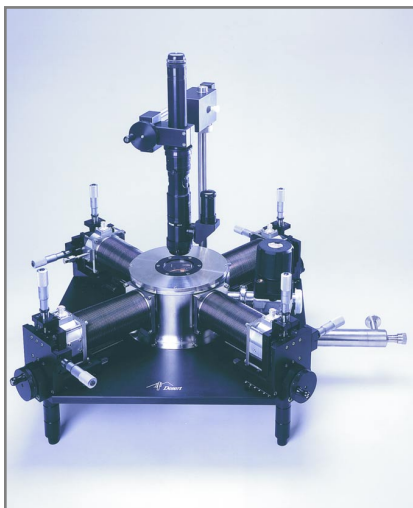
Tuthill Vacuum and Blower Systems has announced the SDV second-generation dry vacuum pump, which is free from lubricating oil or other fluids in the process part of the pump. The new pump features a variable-pitch rotor that provides more of a polytropic thermodynamic compression cycle than does the isochoric compression of a fixed-pitch rotor. As a result, the SDV generates a lower discharge temperature, up to 30% lower power consumption, high volumetric efficiency, and a short gas path through the pump for quick discharge. It also can handle process byproducts such as liquids, condensates, and even small particles. The SDV is offered in seven models, ranging in capacity from 120

to $2700\text{ m}^3/\text{hr}$ (70 to 1600 cfm). *Tuthill Vacuum and Blower Systems, 4840 West Kearney Street, Springfield, Missouri 65803-8702, <http://www.tuthillvacuum.com>*

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Wafer Probe System

The Desert Cryogenics wafer probe station incorporates low-temperature ($4.5\text{--}375\text{ K}$) probe capabilities with both DC and microwave (to 66 GHz) probing at the same time through the use of six manipulated probe stages. The stages are configured in a geometric pattern of four DC probes at 90° -degree orientation and two microwave probes at 180° . Each of the stages can probe a 4-inch wafer, allowing verification of device performance, evaluation, subsequent wafer processing, and retesting for device improvement. The system can accept 5- or 6-



inch wafers as well. Sample holders may be at ground potential, floated above or below ground, coaxially biased, or sampled for backside contact measurements. *Desert Cryogenics LLC, 1665 East 18th Street, Suite 112, Tucson, Arizona 85719, <http://www.desertcryo.com>*

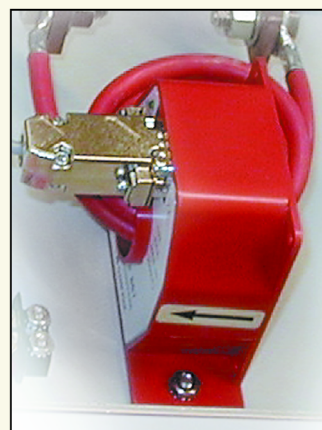
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Electric Current

Instrumentation for Measurement & Control

Current Transducer

867-400



Applications

Electric current measurement or control applications requiring better performance than from Hall transducers or resistive shunts.

For: • Power Supplies • Current Amplifiers
• Power Analyzers • Production Test

Specifications

Voltage isolated	> 5kVac
Current range	0 to $\pm 400\text{ A}$
Signal output	0 to $\pm 200\text{ mA}$
Frequency response	dc to 100 kHz (-3 dB)
Slew rate	> 25 kA/ms
Linearity error	< 3 ppm
Temp coefficient	< $0.5\text{ ppm}/^{\circ}\text{C}$
Aging	< 0.5 ppm/month
Zero offset	< 50 ppm
Output noise, dc to 50 kHz	< 4 ppm rms
Central aperture	26 mm diam.

Price

\$446.50 ea. (U.S.A. list, Qty. 10)

Other models avail. for 600A, 1000A, 1500A, 2000A and 5000A.

www.gmw.com

Click on "Electric Current" then "867"

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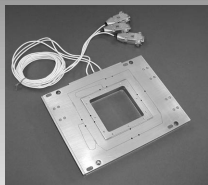
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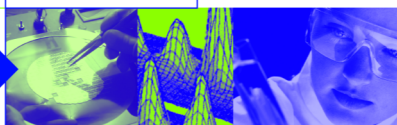
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Cryogen-Free Helium-3 Cryostat

Janis Research Company has developed the HE-3-CCR-SSV, a cryogen-free helium-3 system for cooling samples in vacuum. The cryostat uses a two-stage mechanical cooler to achieve a minimum temperature of about 300 mK. The ^3He gas is permanently stored in the cryostat and is condensed after cooldown. This single-stage design permits ^3He condensation without requiring a 1 K pot and associated pump. The system includes highly conductive flexible thermal links to connect the two stages of the cooler to two copper flanges. These in turn are used to cool two radiation shields and three heat switches that control the ^3He condensation, cooldown, and temperature control. This design significantly reduces vibration that may be transmitted to the sample. The system is supplied with complete instrumentation. *Janis Research Company, 2 Jewel Drive, Wilmington, Massachusetts 01887, <http://www.janis.com>*

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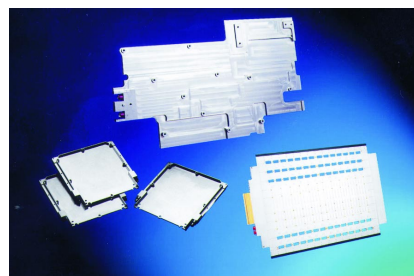
Ion Pumps

VacIon Plus is a new line of ion pumps from Varian, the company that invented the ion pump. The VacIon Plus family includes diode, noble diode, triode, and StarCell pump versions, along with the company's MiniVac and Multivac Ion Pump controllers. The diode version features the highest pumping speed among all ion pumps for oxygen, carbon dioxide, carbon monoxide, and hydrogen. The noble diode VacIon Plus element is a tantalum cathode, used in place of a titanium cathode. That substitution allows a higher pumping speed for pumping noble gases (mainly argon and helium). The triode model, different both electrically and physically from the others, allows high speed and stability when pumping getterable and noble gases, even at relatively high pressures. The StarCell VacIon Plus element is a variation of the triode design, enabling constant operation at pressures of 10^{-8} mbar or above. *Varian Inc, 3120 Hansen Way, Palo Alto, California 94304-1030, <http://www.varianinc.com>*

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Vacuum-Brazed Cold Plates

Lytron has introduced the CP-30, a standard part in the High Performance



series of vacuum-brazed cold plates, designed for high-watt density applications. The High Performance cold plates are manufactured by inserting a corrugated aluminum fin into an aluminum plate with a machined cavity; the plate, lid, and fin are joined with vacuum brazing. Because the corrugated fin provides a very large heat-transfer surface—up to a ninefold increase over the outside plate surface—these cold plates are very efficient. In addition, the fin creates turbulence, which minimizes the fluid boundary layer and increases heat transfer. Vacuum brazing produces a part with uniform thermal conductivity over a large surface area. Lytron offers the cold plates as small as 4 in², as large as 700 in², and as thin as 0.10 in. *Lytron Inc, 55 Dragon Court, Woburn, Massachusetts 01801, <http://www.lytron.com>*

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Digital Capacitance Manometer

MKS Instruments has announced the i-Baratron all-digital capacitance manometer, a welded Inconel pressure sensor with the company's DeviceNet communications protocol. A high-resolution digital output along with the analog-equivalent signal provides accurate, repeatable pressure measurements from 0.02 to 1000 torr. The i-Baratron is compatible with all downstream analog throttle-valve pressure controllers for pressure management capabilities. A pushbutton zero control makes it easier to set up during initial installation and processing. The company's optional PinPoint calibration function optimizes performance at a user-specified pressure value. Temperature control for more stable pressure measurements is available in 45 and 80°C versions. *MKS Instruments Inc, 6 Shattuck Road, Andover, Massachusetts 01810, <http://www.mksinst.com>*

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High Vacuum Gate Valves

A new SoftShut series of high vacuum gate valves from Thermo Vacuum

Generators provides fast, linear gate motion to position the gate, then precisely controls vertical motion for sealing. The design allows the gate to open fully or to close in only 1 to 3 seconds, depending on valve size, yet it virtually eliminates mechanical shock. SoftShut valves are used from 2 bar to less than 1×10^{-8} mbar and have gate and body leak rates less than 1×10^{-9} mbar L/s. They are made of stainless steel, have visual indicators of the valve position, and can be baked up to 200°C, depending on configuration and options. SoftShut valves are available in six sizes, from 63 to 250 mm i.d. with all common flanges. Models up to 160 mm i.d. can be opened with a 1-bar pressure differential in either direction on the gate. *Thermo Vacuum Generators, 355 River Oaks Parkway, San Jose, California 95134, <http://www.soft-shut.com>*

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Liquid Nitrogen Generator

Rigaku/MSI has introduced the NitroGen miniature liquid nitrogen generator, a one-box solution for point-of-use generation, storage, and transfer of the cryogen. The NitroGen produces and stores liquid N_2 using only ambient air as its source. The air is compressed, filtered, and dried prior to passing through a PSA nitrogen generator. The room-temperature process extracts nitrogen gas from the air by passing it through special molecular sieve filters. The resulting pure nitrogen is then



liquefied by a Gifford-McMahon cycle cryo-engine before being transferred into a storage dewar. The NitroGen is available in capacities from 9.6 to 60 L/day. As an option, the NitroGen (gvt) model is equipped to generate -150°C to ambient temperature nitrogen gas for variable temperature applications. *Rigaku/MSI Inc, 9009 New Trails Drive, The Woodlands, Texas 77381-5209, <http://www.rigakumsc.com>*

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Gas Delivery System

Scott Specialty Gases has developed a modular Laboratory Support System

to control specialty gases at point of use when the gas source is at a remote location. Any combination of pressure regulators, purifiers, moisture traps, and outlet valves can be controlled in a single unit with pre-assembled, snap-in panels. Units can be wall or bench mounted or configured to support island workstations; back-to-back installation is also possible. Pressure control panels feature a high-purity regulator with a gauge and will support two outlets with individual shutoff valves. Protection against contaminants in the gas supply is provided. Moisture and hydrocarbon traps are available. Gas delivery panels offer up to five outlets with shutoff valves and can accommodate multiple gas service. *Scott Specialty Gases, 6141 Easton Road, Plumsteadville, Pennsylvania 18949, <http://www.scottgas.com>*

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Connectors for Vacuum and Cryogenic Use

Ceramaseal now offers Sub D Type connectors, available in 9-pin, 15-pin, 25-pin, and 50-pin versions. These nonmagnetic connectors are rated for temperatures between 4 K and 450°C , a DC voltage of 500 V per pin, and a current of 1 A per pin; they also have a UHV leak rate of less than 1×10^{-10} mbar L/s. They can be supplied as weldable or flanged units. Ceramaseal can provide air-side and vacuum-side plugs (made with a polyketone insulating material) for the connectors. Also available from the company is polyimide-based flexible ribbon cable for making an in-vacuum connection to the Sub D Type connectors. *Ceramaseal, 1033 State Route 20, New Lebanon, New York 12125, <http://www.ceramaseal.com>*

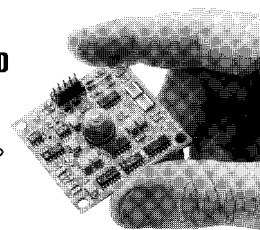
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High-Power RF Amplifier

Amplifier Research has introduced the model 3000W1000, an air-cooled solid-state RF amplifier for electromagnetic compatibility applications in which wide bandwidth and high gain are needed. Derived from the company's basic 1000W1000B modular amplifier, the new amplifier provides 3000 W of RF power from 80 MHz to 1 GHz. It uses push-pull circuitry in all high-power stages to lower distortion and improve stability.

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American Institute of Physics Prize for Industrial Applications of Physics

2003-2004

*Awarded on Behalf of the
Corporate Associates of the
American Institute of Physics*

Sponsored by the
General Motors Corporation
and AIP Corporate Associates

PURPOSE

*To recognize outstanding contributions by
an individual or individuals to the
industrial applications of physics.*

THE AWARD

The prize consists of \$10,000, an allowance for travel to receive the prize, and a certificate citing the contributions made by the recipient(s). The award will be presented at the 2003 Industrial Physics Forum, October 26-28, in San José, CA.

For rules and eligibility requirements,
phone (301) 209-3034 or see:

www.aip.org/iap-prize.html

Nominations are due April 30, 2003.

Send nomination and supporting
documentation to:

Executive Director's Office
Attn: Committee for IAP Prize
American Institute of Physics
One Physics Ellipse
College Park, MD 20740-3843

Or email your nomination to: assoc@aip.org



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Special features include a gain control, internal/external automatic level control, pulse input capability, and RF output level protection. Also included is an internal RF detector with an output for use in self-testing or operational modes. The model 3000W1000 supplies power for applications such as RF susceptibility testing, antenna and component testing, and as a driver for frequency multipliers and higher-power amplifiers. *Amplifier Research, 160 Schoolhouse Road, Souderton, Pennsylvania 18964-9990, <http://www.amplifiers.com>*

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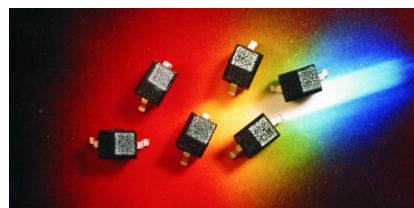
High-Voltage Amplifiers and Function Generators

The models 609E-6-FG and 10/10B-FG from TREK operate as either a DC high-voltage amplifier or a function generator to produce sine, square, or triangle waveforms over a frequency range of 0.2 Hz to 10 kHz. The 609E-6-FG provides 0 to ± 4 kV DC or peak AC output voltages at up to 20 mA and can be configured as a noninverting, inverting, or differential output. The 10/10B-FG supplies 0 to ± 10 kV DC or peak AC at up to 10 mA with a noninverting output only. Both units offer a gain of 1000 V/V and are protected against overvoltage and overcurrent conditions. They also include voltage and current monitors with buffered, low-voltage replicas of the high-voltage and current. These outputs can be used as feedback signals in a closed-loop system. *TREK Inc, 11601 Maple Ridge Road, Medina, New York 14103, <http://www.trekinc.com>*

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Varactor Tuning Diodes

The 3022 series of high-ratio, hyper-abrupt, varactor tuning diodes from Knox Semiconductor was designed to control crystal oscillator frequency with a DC-bias voltage. The capacitance variation of the diode (C/V) is approximately 10:1 over the voltage range of 0.3 to 4.0 V; a particular C/V specification depends on which one of four part numbers are chosen. The highly reproducible ion-implanted structure of the diode offers a high-capacitance swing, linear characteristics of the capacitance versus voltage variation, and uniform capacitance versus temperature coefficient. The



diodes are available in industry-standard packages such as the SOT-23, SOD-323, and the subminiature SOD-523, as well as in chip form. *Knox Semiconductor Inc, 12 Industrial Park Road, Rockport, Maine 04856, <http://www.knoxsemiconductor.com>*

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Toolset for Sound and Vibration Applications

National Instruments' new NI Sound and Vibration Toolset Version 2.0 has added frequency measurements, including zoom FFT, peak search, power-in-band, and more. The updated toolset builds on the company's existing library of measurements and examples used in audio, acoustic, and vibration applications. The new version takes advantage of today's multi-processor computers to enable, for example, the user to perform real-time octave analysis on nearly twice as many channels in a dual-processor computer than with a single-processor computer. *National Instruments, 11500 North Mopac Expressway, Austin, Texas 78759-3504, <http://www.ni.com>*

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New Literature

Pfeiffer Vacuum has released its 2002-2004 Vacuum Technology catalog with more than 600 pages. Products include turbomolecular, rotary vane, roots, dry, and diffusion pumps; vacuum gauges and controllers; helium leak detectors; and vacuum hardware. *Pfeiffer Vacuum Inc, 24 Trafalgar Square, Nashua, New Hampshire 03063-1988, <http://www.pfeiffer-vacuum.com>*

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Fil-Tech has issued a new catalog on coating and vacuum supplies. The catalog features the company's stress-relieving alloy quartz crystals and cross-reference information on replacement parts for electron beam and ion source systems. *Fil-Tech Inc, 6 Pinckney Street, Boston, Massachusetts 02114, <http://www.filtech.com>*

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