

new products

The descriptions of the new products listed in this section are based on information supplied to us by the manufacturers, and in some cases by independent sources. PHYSICS TODAY can assume no responsibility for their accuracy.

Pulsed supersonic valve

Quanta-Ray is offering a "high-performance" pulsed supersonic valve. Supersonic molecular beams are of interest because supersonic expansion results in a dramatic cooling of molecules entrapped in the expanding gas. This cooling significantly simplifies the spectra of molecules under observation. Furthermore, pulsed supersonic beams have become interesting because pulsed lasers are used in most spectroscopic studies of supersonic beams. Pulsed supersonic beams are said to offer significant advantages in improved signal to noise and reduced vacuum-pump requirements.

Pulsed beams have traditionally been used with great reluctance, however, because fast and reliable nozzles have proved difficult and expensive to construct. Quanta-Ray's valve is designed to provide a simple and reliable means of taking advantage of the inherent features of fast pulsed supersonic valves. It operates at repetition rates of up to 10 Hz and back pressures of up to 10 atmospheres. The pulse



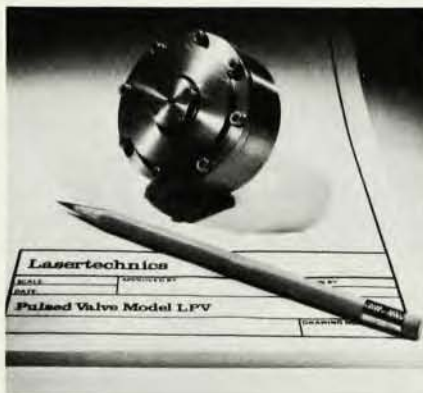
length is very short (approximately 55 microsec using He). The electrical drive circuit provides low-voltage operation of the magnetic-repulsion valve operator, thus reducing electromagnetic interference and the possibility of arcing. Feedback regulation results in high pulse-to-pulse reproducibility. All necessary timing and driving electronics are housed in a compact, rack-

mountable enclosure. The Quanta-Ray PSV system is priced at \$4,900. *Quanta-Ray, 1250 Charleston Road, Mountain View, California 94043*

Circle number 140 on Reader Service Card

Molecular beam valve

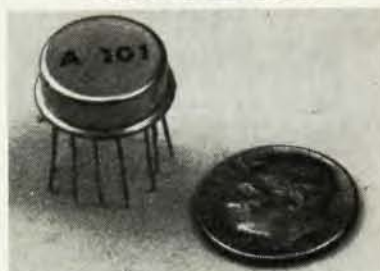
The model LPV molecular beam valve from Lasertechnics is designed for fast operation at high repetition rates. It is said to "offer reliable performance at a very affordable price." Pulse widths are continuously variable from 100 mi-



croseconds to continuously open at repetition rates from 0 to above 500 Hz. The model LPV uses a piezoelectric actuator that results in low-voltage, low-power operation (less than one watt at the highest repetition rates) without cooling.

The valve is constructed of inert materials (stainless steel, Teflon and nickel) that resist attack by halogens, anhydrous acids and other oxidizers. The standard seal is Viton; other materials are available on request. The body of the model LPV is all stainless steel for high strength and vacuum immersibility. Operation is guaranteed for backing pressures up to 10 atmospheres. A selection of nozzle shapes and orifice diameters is available. The nozzles are quickly and easily interchangeable, and they have an unobstructed view from any azimuthal

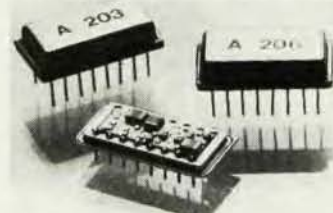
NEW PRODUCT CHARGE SENSITIVE PREAMPLIFIERS



Models A-101 and A-111 are charge sensitive preamplifier-discriminators developed especially for instrumentation employing photomultiplier tubes, channel electron multipliers (CEM), microchannel plates (MCP), channel electron multiplier arrays (CEMA) and other charge producing detectors in the pulse counting mode.



Models A-203 and A-206 are a Charge Sensitive Preamplifier/Shaping Amplifier and a matching Voltage Amplifier/Low Level Discriminator developed especially for instrumentation employing solid state detectors, proportional counters, photomultipliers or any charge producing detectors in the pulse height analysis or pulse counting mode of operation.

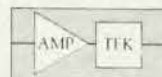


FEATURING

- Thin film hybrid technology
- Small size (TO-8, DIP)
- Low power (5-18 milliwatts)
- Low noise
- Single supply voltage
- 168 hours of burn-in time
- MIL-STD-883B
- One year warranty

APPLICATIONS

- Aerospace
- Portable instrumentation
- Mass spectrometers
- Particle detection
- Imaging
- Research experiments
- Medical and nuclear electronics
- Electro-optical systems



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Model LTS-21-H, Temp. — D84C

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new products

angle. The model LPV is priced at \$990. *Lasertechnics, 6007 Osuna Road NE, Albuquerque, New Mexico 87109*
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Sputter ion source

General Ionex has introduced a cesium sputter-ion-source system that adapts to any commercially available ion microprobe. The model 133 is claimed to increase detection limits for electronegative elements and reduce spectral interference. Providing a 10 mA/cm² current density, and stability better than 1/2% per hour, this "turn-key" system is said to offer higher sputtering



rates than oxygen; a twofold increase for silicon and fivefold for GaAs.

The model 133 is easily interchanged with conventional sputter ion sources. Applications include profiling and analysis of n-type dopants in semiconductors, semimetallic and toxic materials in environmental particulates, and sulfur, halogens, and potentially hazardous materials in biological samples. The unit comes supplied with necessary electronics, coolant circulator, and flanging for attachment. *General Ionex Corporation, 19 Graf Road, Newburyport, Mass. 01950*

Circle number 142 on Reader Service Card

Electron gun

FEI has introduced a uhv-compatible electron gun that can focus a 30-microamp current into a 100-micron-diameter spot at up to 30 keV with a 4-inch working distance. The electron beam can be rastered or translated ± 5 mm parallel to the gun axis by means

of an eight-plate deflection system. An optional current controller can maintain target currents in the range from 1 nanoamp to 30 microamps constant to within 1% over a period of hours. The gun uses an FEI low-heating power, single-crystal LaB₆ cathode with a useful life exceeding 1000 hours. *FEI, 2575 NE Kathryn Street, #34, Hillsboro, Oregon 97123*

Circle number 143 on Reader Service Card

Temperature controller

The model E-3010 from Thor is a wide-range temperature controller, designed to provide automatic three-term con-



trol over a temperature range from 1 K to 2300 K. The automatic controller consists of a chopper dc amplifier that compares the output voltage of the sensor with a highly stable dc reference. The error voltage thus derived provides proportional, integral and derivative power terms for correcting the temperature. All three terms may be set up to provide optimum operational response. The overall loop gain is variable, to match the user's sensor selection. A built-in constant-current source is provided for use with resistance sensors such as germanium, carbon or the strain-gauge type. Thermocouples may be used directly; gold-iron/chromel for low-temperature work between 2 K and 300 K, resistance sensors from 1 K, and copper/constantan or platinum/platinum-rhodium for the higher ranges. The reference voltage range is compatible with the output from all of these sensors. It also provides a high-level output for use with gallium arsenide and silicon diode sensors.

Outputs are provided for both cryogenic and high-power requirements. Voltage-controller output allows the heater resistance to determine the maximum power dissipated. This removes the necessity for the heater to have a specific resistance. Two meters give individual indication of error or temperature deviation and percentage power output. A remote program input is provided for use with Thor's model E-2020 electronic programmer in applications where linear increase or decrease of temperature is required. *Thor Research, 4422 MacDonald Ave., Richmond, California 94805*

Circle number 144 on Reader Service Card

Fast atom bombardment

Ion Tech's saddle-field, cold-cathode ion gun has been developed into a new fast-atom gun. Thus the saddle-field gun now produces "a true all-neutral beam of fast atoms," we are told. The physical etching properties of this fast-atom beam have been utilized in a new surface analysis technique for mass spectrometry called fast-atom bombardment (FAB). Using a source of fast atoms produced from a charge-exchange cell, chemists at the University of Manchester have developed an FAB source containing the specimen holder, manipulators and ion optics, and attached it to their mass spectrometer. They have also developed a new specimen-processing technique to be used with the FAB source.

The fast-atom beam is claimed to be very successful at producing secondary ionized fragments from the specimen, which can be analysed and measured in the mass spectrometer. The manufacturer stresses the fact that the FAB method allows ionization of the specimen material at room temperature; thermally labile materials can thus be examined together with high-molecular-weight materials. The saddle-field FAB-GG gas gun provides an intense beam of fast atoms. It is simple to install and operate. Unlike other sources that produce beams of ions flooded with electrons, the FAB-GG gas guns have true neutral beams without any charge. This means they do not need the addition of an inefficient and noisy charge-exchange cell to produce atoms.

The saddle-field FAB-GG gas gun can be supplied ready to mount onto the user's mass-spectrometer FAB source. It comes with its own power supply unit and only needs a source of very pure argon and a single-phase electricity supply. *Ion Tech Ltd., 2, Park Street, Reddington, Middlesex, England TW1 0LT*

Circle number 145 on Reader Service Card

CdTe needle probes

RMD has introduced a new line of solid-state needle probes for beta and gamma



detection. These subminiature detectors provide high resolution with a minimum of background counts. For the first time, we are told, a solid-state CdTe nuclear detector can be reliably packaged in needles as small as 1 mm. Probes are available in sizes down to 1 mm (outer diameter), and they operate at low voltages (20 V is typical) for increased safety. Applications include reactor fuel-rod measurements and thickness gauging of small parts. The needle probe is suitable for *in-vivo* tracer measurements in medicine. The cadmium telluride detector element is said to provide superior sensitivity and resolution while operating at low voltages.

A new manufacturing process allows the use of up to three omnidirectional cadmium telluride detectors per needle for superior spatial resolution. Detector elements may be specified in a number of sizes. They can be mounted in a variety of packages other than the basic needle configuration. *Radiation Monitoring Devices, 44 Hunt Street, Watertown, Mass. 02172*

Circle number 146 on Reader Service Card

Electrostatic voltmeter

Trek's new model 362 electrostatic voltmeter system is intended for noncontact measurement of electrostatic emf (in volts) with an accuracy of $\pm 0.1\%$. The model 362 is said to provide high accuracy, high bandwidth and exceptional reliability under the adverse temperature and humidity conditions encountered in electrophotographic and xerographic application. The oper-



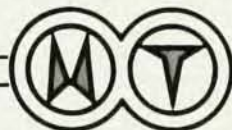
ating range of the instrument is 0° to 50° C; and up to 85% (noncondensing) relative humidity. The system utilizes a new low-impedance, dual-chopper probe design to negate the effects of high humidity, which is said to plague probes of other designs, while providing high bandwidth and flat response characteristics. *Trek, 1674 Quaker Road, Barker, New York 14012*

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DELAY AMPLIFIER



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