

TPD Workstation

Manufacturer: Hiden.

Product: Complete experimental system “TPD Workstation” for the analysis of thermal desorption products by UHV TPD/TDS. Application areas include thin films, photovoltaics, semiconductors and solid oxide fuel cells.

Features: The workstation features a multiport UHV chamber with heated sample stage coupled to a high precision triple filter analyzer with digital pulse ion counting detector for ultimate sensitivity and time resolution. The triple filter mass analyzer is configured with a cooled shroud giving minimum outgassing with optimum sensitivity of the analyzer to desorption products from the sample. A fast sample load lock with sample transfer mechanism is included to provide for rapid sample change. The unique sample transfer mechanism means only the sample is transferred from the load lock to the heater stage ensuring

no sample holder outgassing during the TPD experiment. The “TPDsoft” thermal analysis PC software included with the Workstation provides automatic control of sample temperature integrated with analyser control. TPD analysis routines (e.g. peak integration, deconvolution and background subtraction, etc.) are also included in this package.

Also available is a new cryogenic stage option: A dry gas purged glove box and liquid nitrogen cooled load lock allows air sensitive or cooled samples to be loaded into the system without contamination or condensation of water vapor and their temperature maintained at sub ambient temperatures until loaded into TPD analysis chamber.



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Piezo Ultrasonic Driver

Manufacturer: SI Scientific Instruments.

Product: Piezo driver “PDUS210”, a complete solution for driving precision and high-power ultrasonic actuators. The amplifier includes high-speed resonance tracking of a series or parallel resonance



modes, vibration amplitude control, and analysis functions such as impedance and frequency response measurement. It is well suited to both OEM product integration and laboratory use for research and development.

Features: The instrument generates a pure sine-wave output which avoids the excitation of secondary resonance modes by the drive harmonics. This makes it ideal for operating at the electrical parallel resonance, or “anti-resonance”. This operating point is close to the mechanical resonance frequency but is less sensitive to changes in load dissipation, which is useful in precision machining applications where constant vibration amplitude is desired. The operation is controlled via USB and the included software package. An RS485 interface also provides a straight-forward method to control and monitor the amplifier for automatic test and OEM applications. The device is available with standard output voltage ranges from 17 V_{rms} to 282 V_{rms} and current ranges from 0.7 A_{rms} to 11 A_{rms} . These ranges are optimized for load impedances ranging from 1.5 Ohms to 400 Ohms at resonance. For research and develop-

ment applications, a reconfigurable version is available (“PDUS210-FLEX”) which uses external output matching transformers that are purchased separately. A transformer kit (“TX210-Kit1”) is also available which includes all six standard output voltage ranges at a discounted price.

Applications: Ultrasonic drilling and cutting, medical devices, dental devices, ultrasonic testing, liquid cavitation, and vaporization.

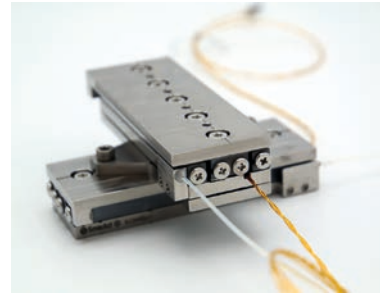
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Cryogenic Positioning Stages with High Closed-Loop Positioning Performance

Manufacturer: SmarAct.

For cryogenic applications where highest precision and thermal stability are essential for successful operation, SmarAct has developed cryogenic positioning stages featuring unmatched closed-loop positioning performance with resolutions well below 1 nm. This makes SmarAct's Closed-Loop Cryogenic Stages ideally suited, for example, in the field of fundamental research including 2D materials science or for cryogenic applications such as low-temperature quantum technologies. The high-performance stages are specifically designed to meet the most demanding requirements that world-changing technologies like quantum computing induce. Materials are selected to match the required thermal properties and prevent mechanical stress during cooling and heating cycles. This ensures long lifetime under cryogenic and ultra-high vacuum conditions. Fully non-magnetic versions are

available for use in high magnetic fields. SmarAct's positioning stages are known for their durability in various and even extreme environments. For the closed-loop cryogenic variants, SmarAct combines its stick-slip piezo drive stages with its high-performance PicoScale sensor heads, which are based on an all-optical Michelson interferometric design. SmarAct's Closed-Loop Cryogenic Stages are available with travel ranges from 16 to 49 mm. To fulfill customers' individual requirements, completely customized setups are also possible.



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WILEY

New Balanced Photoreceivers up to 500 MHz

Manufacturer: FEMTO Messtechnik.

Product: The low-noise balanced photoreceivers of the “HBPR” series enable the differential measurement of optical signals with wavelengths from 320 nm to 1700 nm and bandwidths up to 500 MHz. The optical inputs are optionally free space or fiber-coupled to ensure maximum compatibility with common optical accessories. The photoreceivers are ideally suited for highly sensitive and precise acquisition of laser pulses, even with high repetition rates and rapidly changing signal shapes, e.g. as required in quantum state tomography.

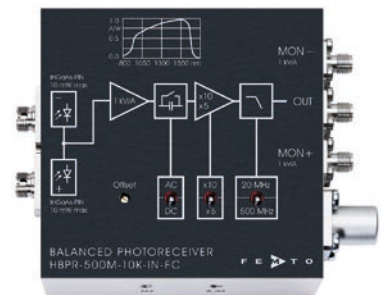
Features: The photoreceivers of the new series use two photodiodes selected in pairs, which are connected in anti-parallel, and a subsequent low-noise transimpedance amplifier to detect the differential signal. The series is characterized by a very low input noise (NEP) down to 3.7 pW/√Hz and a high common mode rejection (CM-RR) of up to 55 dB. Various models with Si

or InGaAs photodiodes and bandwidths from 100 MHz to 500 MHz are available. The output coupling is switchable (AC/DC), the gain can be set in two stages, and the bandwidth can be limited to 20 MHz. Two monitor outputs with 10 MHz bandwidth enable fast, separate acquisition of the individual input signals.

Applications: Optical spectroscopy, coherent heterodyne detection, homodyne detection of optical quantum states, optical coherence tomography (OCT), differential optical front end for oscilloscopes, spectrum analyzers, A/D converters and lock-in amplifiers.

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Complete Solution for Cold Atom Applications

Manufacturer: Menlo Systems.

Product: All-in-one solution “FC1500-Quantum” for various Quantum 2.0 applications, like quantum optical clocks, atom interferometry experiments, or quantum computers based on ions or neutral atoms. The system is tailored according to the customer’s requirements and delivers an engine for operating the physics package.

Features: This rack-mounted system consists of the “ORS Ultrastable Laser” with a sub-Hz linewidth, an “FC1500-250-ULN” Ultra Low Noise Optical Frequency Comb with light in the visible and infrared spectral range, and several customizable CW lasers. The ULN comb transfers the narrow linewidth and stability of the ultrastable laser throughout the entire comb spectrum, and via high-fidelity phase-lock loops stabilizes the CW lasers required to drive atomic transitions of the application. Optical lattice clocks and quantum computers based on ions or neutral atoms require

up to eight lasers operating at specific frequencies. The system includes them all in three 19” racks, providing sub-Hz linewidth and accurately tuned CW lasers in optical fibers ready to be sent to the customer’s physics package. For instance: For the critical clock transition at 698 nm in neutral strontium, a spectral purity transfer down to the 10⁻¹⁸ level at 1 second is achieved. There is the possibility to integrate lasers from MOGLabs, AOSense, Toptica Extended Cavity Diode Lasers, NKT Photonics fiber lasers, and M-Squared Ti:Sapphire lasers.

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Oil and Abrasion-free Vacuum Down to 10^{-3} mbar

Manufacturer: VACUUBRAND.

Product: Unique, dry, and abrasion-free fine vacuum screw pump "VACUU-PURE 10" for vacuum down to 10^{-3} mbar. The pump features maintenance-free technology with no wear parts and delivers a pumping speed of $10 \text{ m}^3/\text{h}$. Users benefit from clean processes, greater efficiency, and improved sustainability.

Features: The pump's special design features two cantilevered spindles and a magnetic gear which is completely oil-free. This allows clean, hydrocarbon-free processes and pure products without contamination in the entire vacuum range. The spindles run contact-free, eliminating wear and abrasion. There is no particle generation through abrasion that contaminates the

vacuum or exhaust air. A further advantage is that no regular maintenance is required and that the vacuum process is not affected by wear and tear on the pump. A factor contributing to the efficiency is the extraordinary condensate tolerance, even with high chemical vapor generation. This means that a gas ballast is unnecessary. The disadvantages associated with the use of a gas ballast, such as reduced pumping speed and increased noise levels, are eliminated. An integrated regeneration mode also allows the vacuum pump to dry quickly after the end of the process.

Applications: The vacuum pump covers many application areas in the fields of analytics, fore vacuum for turbomolecular pumps, and the regeneration of cryo-

pumps. It also enables processes such as vacuum drying, freeze drying, heat treatment, degassing, and coating. Uniquely among fine vacuum pumps, these pumps can also be used continuously at higher vacuum pressures, thus allowing the evacuation of larger systems from atmospheric pressure down to the 10^{-3} mbar vacuum range without changing the vacuum pump.

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Vacuum Manipulators

Manufacturer: VACGEN.

Distribution: Andreas Mattil – Technischer Vertrieb.

Product: Extensive range of manipulators to suit the customer's requirement and budget.

Features: Each manipulator has an extensive range of VACGEN accessories which can be fitted to it. These include heaters, feedthroughs, cooling, rotary drives, hollow drives, motors, and controllers. All manipulators can be fitted to systems in any orientation, including inverted. They have a double bolt holed base flange, which is critical for correct alignment, and thus avoiding setup problems with the X-Y travel not tracking parallel to other compo-

nents within the system.

The "MiniAx" is the low-cost entry-level manipulator, but still offers a stable platform for samples.

The "HPT-WX" manipulator offers a very stable platform for samples with the option of motorisation.

The "Transax" manipulator offers a very stable platform for samples requiring longer Z travel, owing to a second support bearing in the X-Y stage. This supports a 28 mm support tube that passes through the bellows assembly and reduces the length of the unsupported support tube and increases rigidity.

The "OmniAx" manipulator offers an extremely stable platform over the "Transax",

and is considered a world leader, owing to the proprietary designed Z support spine, with recirculating bearings for the travel. The "Wide Bore OmniAx" manipulator has been designed for the larger AS Scientific style of cryostats, which are mounted on a 152 mm flange, and requires more space for the larger heads to rotate.

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