OPTIMIZED ELECTRONIC COMPONENTS FOR SILICON DRIFT DETECTOR OPERATION -
THE NEW VICO SERIES FROM KETEK

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KETEK has developed a new product family of discrete electronic components, engineered specifically for operation with VITUS Silicon Drift Detectors. The new VICO Electronics offers OEM customers fast time-to-market. Approved electronic circuits are complimented with a well documented design and comprise a powerful engineering tool. The additional available VICO evaluation board is a tailored OEM development platform for customized OEM spectrometer designs.

- VICO Electronics are packaged in flat and minute, standard DIL housings and can therefore be easily adapted by using standard 2.54 mm sockets.
- VICO Electronics are designed and tested to fulfill European CE regulations regarding electromagnetic emission and immunity. In order to ensure that the requirements of the EMC directives are upheld, the final equipment must be assessed afresh.
- Magnetic shielding of the VICO components ensures maximum operating margin even in the case of electromagnetic interference generated by neighboring X-ray sources or switch-mode power supplies. Furthermore, the provided shielding reduces the device’s own electromagnetic interference potential to a minimum.

The new VICO family consists of:

- **Preamplifier** designed for the optimal performance of VITUS detectors. It generates a ramped output signal of positive polarity with very low peak shift (<2eV) over the whole specified temperature range of -10° to +50°C at free air convection. FWHM below 127 eV and P/B in the range of 20000 are achievable.

- **High Voltage Supply** which provides the detector bias voltage (typically -165V ±0.03% line regulation). It is characterized by a minimal output ripple down to 30mV_{pp} despite the module’s high efficiency. The module comes with a continuous output short-circuit protection, available on request at different output voltages.

- **TEC temperature controller** provides a 3.6V/700mA output stage for peltier elements which may be extended by an external booster transistor. At full load, a maximum thermal dissipation loss of 1.2W is offered. Due to the optimized thermal design, no active cooling is required for operation. The non-switched linear regulator guarantees minimum noise insertion in the SDD’s signal path. An analogue PI algorithm leads to very quick and stable temperature settings (±0.5°C), adjustable by a potentiometer in the range of 0°C to -60°C. The controllers are compatible with both temperature diodes and thermistors as the temperature sensor.

- The state of the art **Digital Pulse Processor** board contains a high performance A/D-converter with 16 bit and a sample frequency of up to 65 MHz. Two interfaces are provided, USB2.0 and Ethernet. Configuration allows the input of either exponential or ramped signals while the input stage is capable of handling single ended and even fully differential signals.

- The **evaluation board** has a spectroscopic and EMC approved design. It can be used by OEMs as a reliable reference for evaluating own designs. Apart from an SDD, VICO-EV is equipped with sockets for the preamplifier, temperature controller and HV supply. Relevant measuring points on the board are easily accessible. By simply connecting ±9V to 30V DC to the PCB the ramped output signal is obtained.