



KETEK'S UNIQUE
**GRAPHENE
WINDOW**

**IMPROVED
SDD COOLING
TECHNOLOGY**

KETEK'S PROPRIETARY
**CHARGE SENSITIVE
AMPLIFIER**

**CONSTANT HIGH
PERFORMANCE
UP TO +80 °C HEAT SINK
TEMPERATURE**



VITUS

KETEK VITUS SILICON DRIFT DETECTORS (SDDs)

KETEK VITUS Silicon Drift Detectors (SDDs) are the state-of-the-art X-ray detectors for the energy range from 0.05 keV to 30 keV. They are used in manifold applications such as EDS, XRF, μ XRF and TXRF, in electron microscopes, benchtop systems, XRF handheld spectrometers as well as in recycling and mining material sorting installations. Due to their wide operating temperature range, their excellent energy resolution and high reliability they are particularly suited for industrial applications, even in harsh environments where the detectors experience very high ambient temperatures, shocks and vibrations.

GRAPHENE WINDOW TECHNOLOGY

- Two window types available:

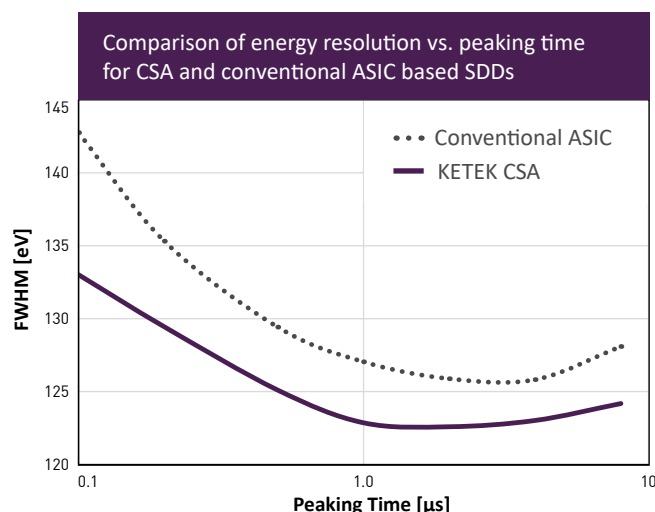
CH WINDOW

1 μ m Carbon without support grid (replaces the 8 μ m Beryllium window)

CL WINDOW

165 nm Carbon with Silicon support grid (86 % open area) for low energy applications

- Both window types allow vacuum encapsulation of detectors for excellent cooling performance
- Transmission better than conventional window types over whole energy range



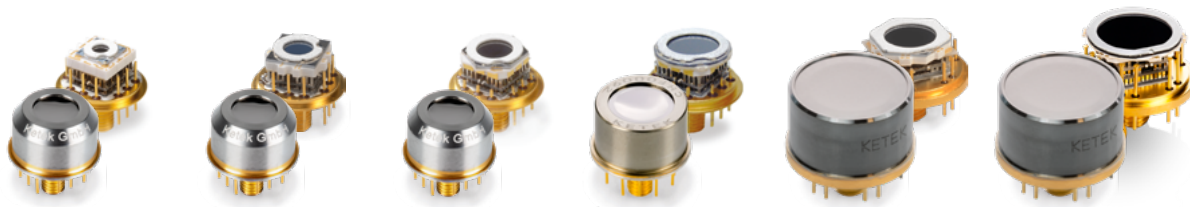
KETEK PROPRIETARY CHARGE SENSITIVE AMPLIFIER (CSA)

- Significantly improved energy resolution, especially at short peaking times
- Extremely high throughput at appropriate DPP settings
- Fully compliant with conventional ASIC technology

NEW SDD COOLING TECHNOLOGY

- 60 °C SDD chip temperature achievable even at +65 °C heat sink temperature
- Drastically increased efficiency of the thermoelectric cooling (e.g. 250 mW at -35 °C sensor temperature)
- Ultra stable vacuum integrity for typically more than 10 years of operation

VITUS



H7
CH/CL

H20/H20 SLF
CH/CL

H30
CH/CL

H50/K50
CH/CL

H80

H150

COLLIMATED AREA [mm²]

7

20

28

47

80

143

ACTIVE AREA [mm²]

13

30

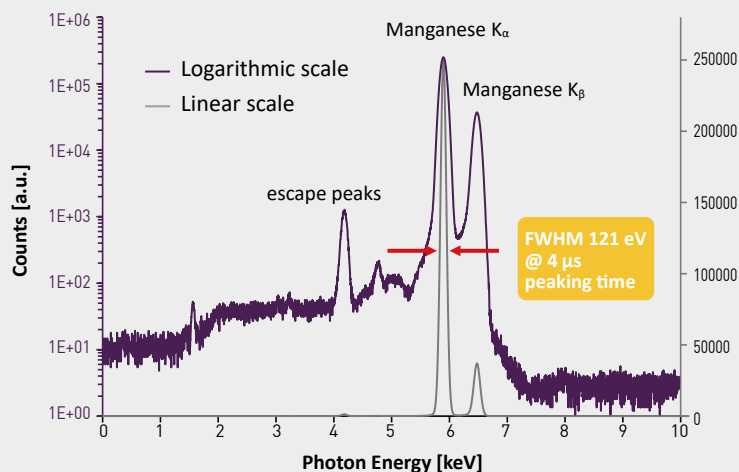
41

65

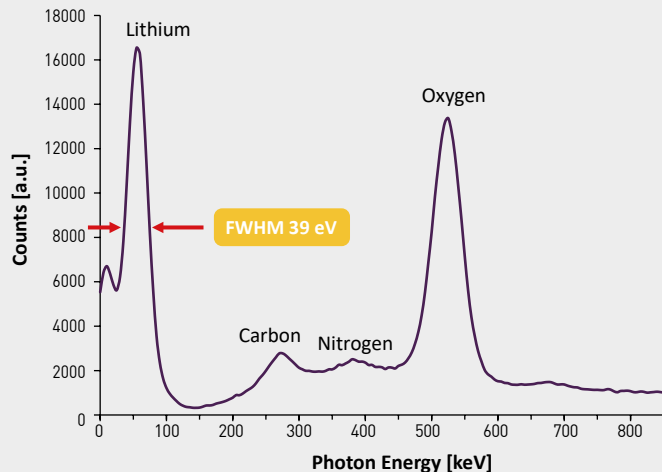
100

170

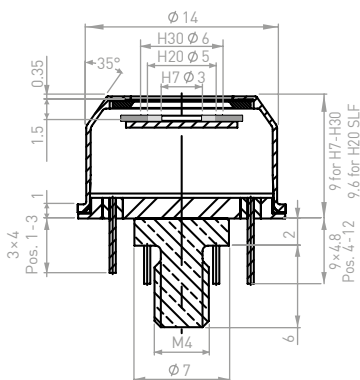
Energy resolution FWHM down to 121 eV for Manganese K_α at 4 μs peaking time



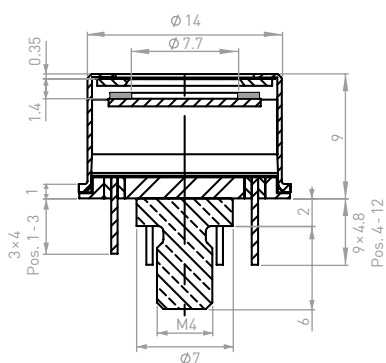
Low-energy spectrum acquired with VITUS SDD showing Gaussian Lithium and Oxygen K_α peaks



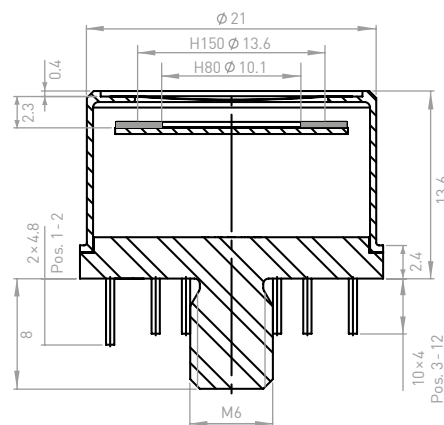
H7-H30



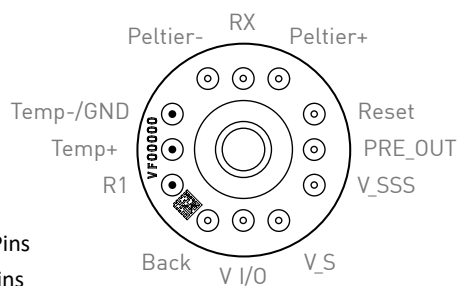
H50 K50



H80-H150

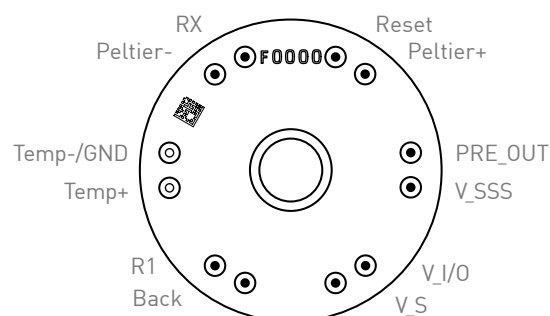


PIN ASSIGNMENTS
BOTTOM VIEW
H7-H150



⊙ Short Pins
⊙ Long Pins

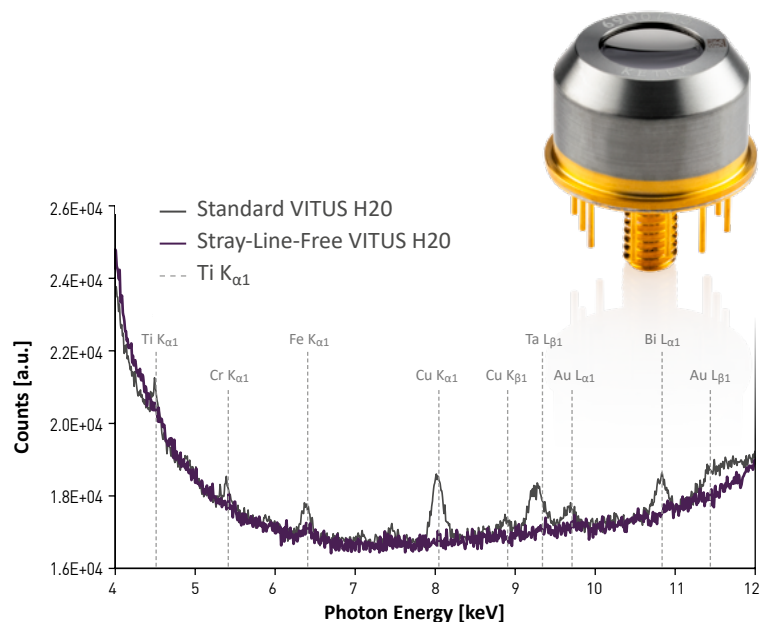
H7 / H20 / H30 / H50 / K50



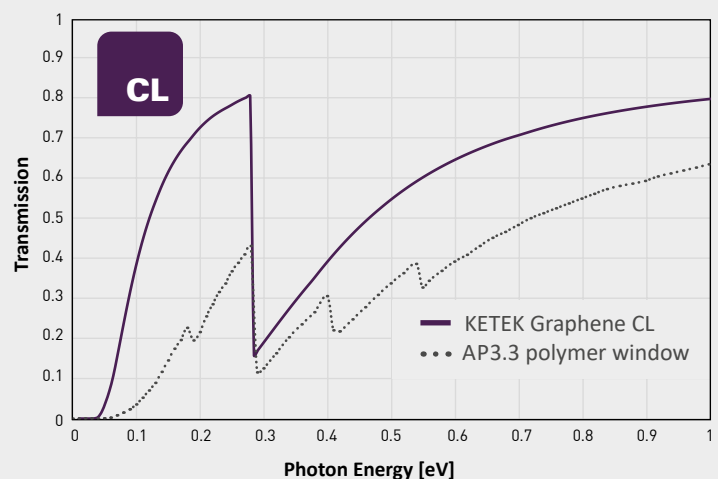
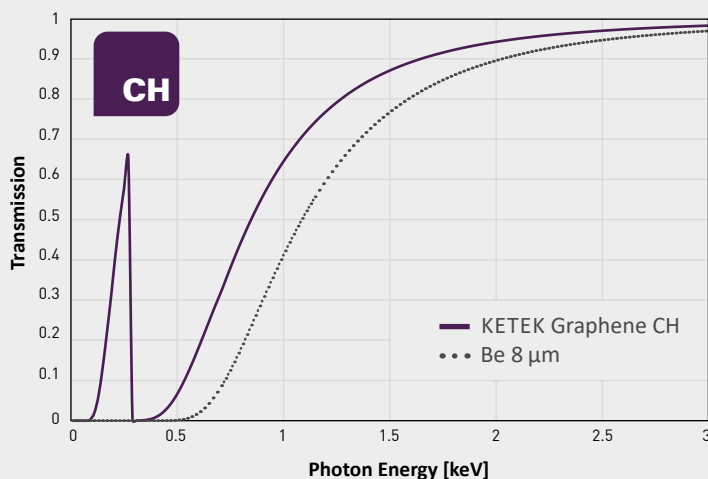
H80 / H150

KETEK SLF STRAY-LINE-FREE MODULE

- Available for VITUS H20
- Elimination of nearly all unwanted X-ray fluorescence (stray lines) from internal SDD components
- Enables extremely low detection limits in the ppb regime
- Perfect for applications like:
 - RoHS, REACH
 - Pharma
 - Semiconductor industry
- Both Graphene window types (CH and CL) available
- Vacuum encapsulation allows He atmosphere operation



WINDOW TRANSMISSION



SPECIFICATIONS

Specifications for H7-H150

First stage amplification	ASIC
Energy resolution for H7-H50 and K50	≤ 129 eV @ Mn K _α
Energy resolution for H80-H150	≤ 136 eV @ Mn K _α
Peak to background	> 15,000
Peak to tail	> 2,000
Optimal peaking time at max. cooling	1 μs
Absorption depth Si for H7 to H150	450 μm
Absorption depth Si for K50	550 μm
Peak shift stability up to 100 kcps	< 1 eV
Max. input count rate	4,000 kcps
Window for H7-H50 CH and K50 CH	CH (1 μm Graphene)
Window for H7-H50 CL and K50 CL	CL (165 nm Graphene)
Window for H80-H150	Be (25 μm Beryllium)
Cooling performance	@ +20 °C heat sink ΔT > 95 K
On-chip collimator	multilayer

Typical SDD parameters

Typical SDD parameters	Voltages	Currents
Ring 1 (R1)	-20 V ± 10 V	10 μA
Ring X (RX)	-130 V ± 30 V	10 μA
Back	-80 V ± 20 V	< 1 nA
Peltier element for H7-H50 and K50	5.5 V	600 mA max.
Peltier element for H80-H150	9 V	1000 mA max.
Temperature monitor	NTC thermistor 10 kΩ @ 25 °C	
Output signal	ramped reset type	
Output gain	1.6 mV/keV ± 20 %	



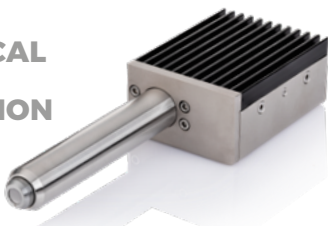


ORDER INFORMATION


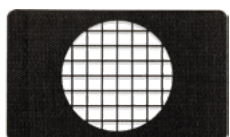


H7 CH/CL	H20 CH/CL	H30 CH/CL	H50 / K50 CH/CL	H80 / H150
H7 CH V000-KTN0-H007-MA2C	H20 CH V000-KTN0-H020-MA2C	H30 CH V000-KTN0-H030-MA2C	H50 CH V000-KTN0-H050-MA6C	H80 V000-KAT0-H080-ML4A
	H20 SLF V000-KTN0-H020-MEJC		K50 CH V000-KTN0-K050-MA6C	
H7 CL V000-KTN0-H007-MA2G	H20 CL V000-KTN0-H020-MA2G	H30 CL V000-KTN0-H030-MA2G	H50 CL V000-KTN0-H050-MA6G	H150 V000-KAT0-H150-ML4A

SDD ELECTRONICS

Product	Description
VIAMP-KC/-KL 3.0 VITUS AMPLIFIER 	<p>The VIAMP-KC/-KL 3.0 module combines a VITUS SDD (all sizes H7 to H150) and an ultra-low noise preamplifier of the latest generation 3.0 with improved biasing stability. The Aluminum housing functions as an efficient heat sink.</p> <ul style="list-style-type: none"> ■ VIAMP-KC 3.0 for H7 to H50 ■ VIAMP-KL 3.0 for H80 to H150 ■ Ramped reset type output signal ■ Configurable via FFC interface ■ Customized solutions available on request
VICO-DV 3.0 COMPLETE DPP ELECTRONICS BOARD 	<p>The complement of the VIAMP module is the VICO-DV 3.0, comprising KETEK's new high-performance digital pulse processor DPP3, a temperature controller and all voltage supplies for the SDD. Also an analog version without DPP3 is available.</p> <ul style="list-style-type: none"> ■ KETEK's new DPP3 with peaking times down to 25 ns ■ Extremely small dimensions 60 × 32 × 11 mm³ ■ Ethernet, USB and SPI interfaces ■ Comprehensive programming library (VICOLib), acquisition software (VICOScope) and update tool (VICOUpdate) available for Windows and Linux
AXAS 3.0 ANALYTICAL X-RAY ACQUISITION SYSTEM 	<p>The AXAS 3.0 is KETEK's new all-in-one system for VITUS SDDs in an ultra compact housing equipped with the latest generation 3.0 preamplifier technology. It is available with all VITUS SDDs from H7 to H50 and different lengths of the vacuum tight finger.</p> <ul style="list-style-type: none"> ■ Very small & complete XRF system: 81 × 61 × 36 mm³ ■ KETEK's new high-performance digital pulse processor DPP3 with peaking times down to 25 ns ■ Ethernet and USB Type-C interface ■ Mapping Mode for scanning applications ■ Acquisition software (VICOScope) and update tool (VICOUpdate) available for Windows and Linux

ACCESSORIES

Product	Description
VMLCOL EXTERNAL COLLIMATOR 	<p>The clip-on mount for external multi-layer collimators suits all VITUS SDDs up to the H50. Different collimator apertures are available. The VMLCOL prevents the excitation and fluorescence of the SDD's cap material.</p> <ul style="list-style-type: none"> ■ No stray lines from SDD cap ■ Improved P/B and P/T ■ Additional protection for the VITUS entrance window
VCGRID CARBON PROTECTION GRID 	<p>The pure carbon grid can be mounted within an instrument in front of the SDD in order to protect the window from mechanical impact.</p> <ul style="list-style-type: none"> ■ Open area > 75 % ■ Thickness < 0.58 mm ■ Withstands a static stress up to 50 N ■ Customized grid designs available on request

