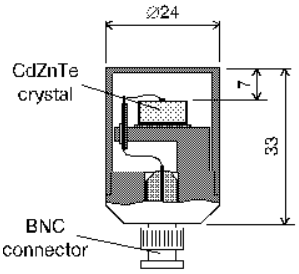
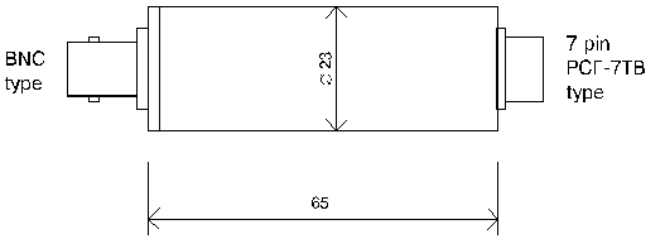
CdZnTe detectors for gamma spectroscopy from Kitec



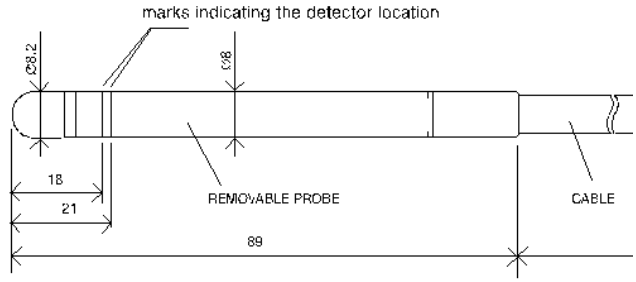
- **small, handy and ruggedized**
- **no liquid nitrogen necessary**
- **3 to 5 times better resolution than NaI**
- **Ideal for mobile nuclide identification**

CZT 500



CdZnTe detectors are applied where isotope identification has to be done with good resolution and low effort and where sufficient radiation is present.

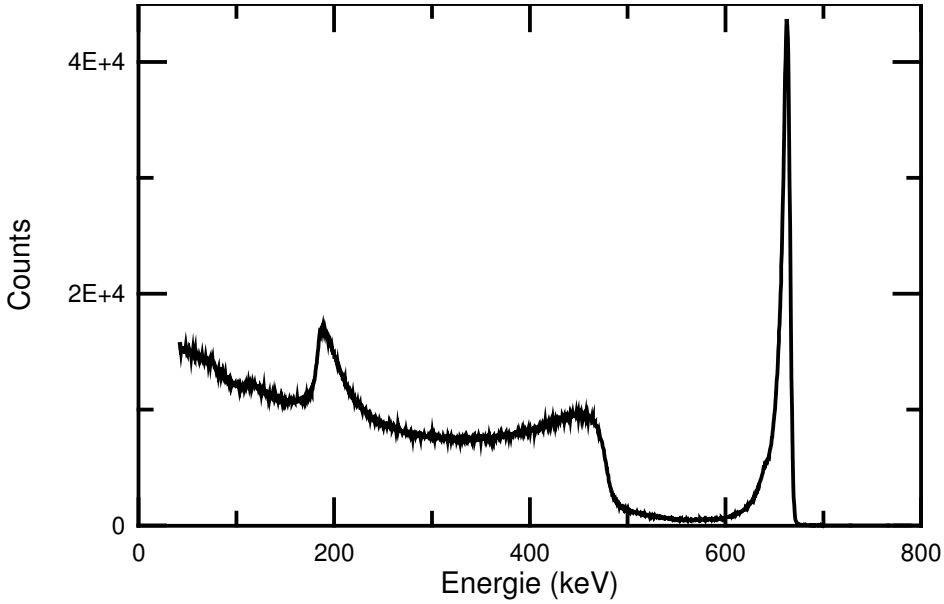
preamplifier PA101 für CZT 500



SDP 310 (preamplifier included)

Applications

- Surveillance of nuclear installations (IAEA Safeguards)
- Uranium / Plutonium enrichment measurements
- examination and identification of radioactive material
- training / education



Cs^{137} spectrum measured with a SDP310/Z/60 supergrade

GBS ELEKTRONIK GmbH

Technical data:

detector type	SDP310/Z/20		SDP310/Z/60		CZT500	
	Standard	**Super grade (S)**	**Standard**	**Super grade (S)**	**Standard**	**Super grade (S)**
crystal volume	5 mm3 ... 30 mm³	5 mm³ ... 30 mm³	50-70 mm³	50-70 mm³	500 mm³	500 mm³
size of crystal	3*3*1.4 mm	3*3*1.4 mm	5*5*2.5 mm	5*5*2.5 mm	10*10*5 mm	10*10*5 mm
Warranted resolution (FWHM) for 662 keV	≤ 22	≤ 10	≤ 25	≤ 15	≤ 30keV	≤ 18
peak to Compton at 662 keV	≥ 1.6	≥ 2.5	≥1.8	≥ 2.5	≥ 2.3	≥ 4.0
preamplifier	integrated	integrated	integrated	integrated	attached to detector	attached to detector
signal rise time	<500ns	<500ns	<500ns	<500ns	100-200ns	100-200ns
output signal	-0.02...0.05 mV/keV	-0.02...0.05 mV/keV	-0.02...0.05 mV/keV	-0.02...0.05 mV/keV	0.04 mV/keV	0.04 mV/keV
preamplifier supply	+12V, 12 mA; -12V, 8mA	+12V, 12 mA; -12V, 8mA	+12V, 12 mA; -12V, 8mA	+12V, 12 mA; -12V, 8mA	+12V, 18 mA; -12V, 15 mA	+12V, 20 mA; -12V, 15 mA
high voltage	up to +600V	up to +600V	up to +600V	up to +600V	up to +1000V	up to +1000V
length	90 mm	90 mm	90 mm	90 mm	33mm (detector)	33mm (detector)
diameter	8.2 mm	8.2 mm	8.2 mm	8.2 mm	23mm	23mm
efficiency* für 662 keV	0.3%	0.3%	0.75%	0.75%	3.3%	3.3%
yield at 662 keV (effective area)*	0.01...0.03 mm²	0.01...0.03 mm²	0.1...0.3 mm²	0.1...0.3 mm²	2.5...3.5 mm²	2.5...3.5 mm²
Maximum radiation (Cs137) for maximum count rate	250 mGy/h (100 kcps)	250 mGy/h (100 kcps)	50 mGy/h (100 kcps)	50 mGy/h (100 kcps)	3 mGy/h (50 kcps)	3 mGy/h (50 kcps)
cable length	8 m standard max. 20m	8 m standard max. 20m	4m standard max. 20m	4m standard max. 20m	2m standard max. 20m	2m standard max. 20m
radiation window	0.25 mm stainless steel	0.25 mm stainless steel	0.25 mm stainless steel	0.25 mm stainless steel	1 mm aluminum	1 mm aluminum

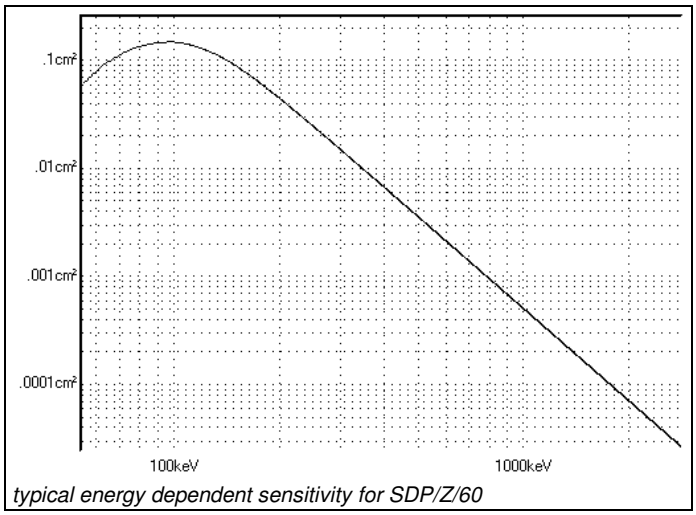
Connectors: Sub-D9 plug for preamplifier supply, BNC for signal and SHV for high voltage.
Temperature range: 0...+30 C.

Further Detectors available, options

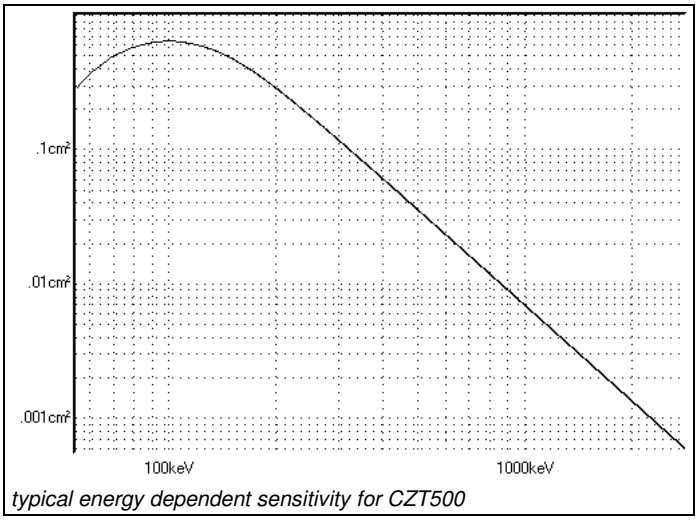
- higher sensitivity → CZT1500
- even smaller diameter (6mm) → SDP313
- temperature stabilized up to °75C → TSDP410
- CZT500 integrated with preamplifier → SDP500
- counting grade detectors, pixel arrays, special requests → please ask.

Warranty: 1 year. Delivery time 8-12 weeks typical. Technical changes reserved.

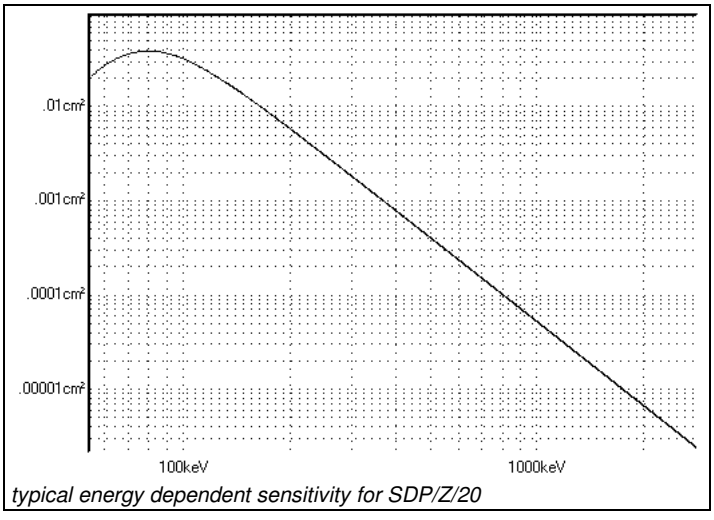
*Efficiency is defined here as: $E = \frac{S}{A}$ with the detector area A and the sensitivity S. The sensitivity S can be calculated as: $S = \frac{4\pi Nr^2}{FmT}$ with N counts in the peak, measured with a distance r between radiation source and detector, the activity F of the radiation source, the emission probability m for the considered photon energy for one decay and the measurement time T.



typical energy dependent sensitivity for SDP/Z/60



typical energy dependent sensitivity for CZT500



typical energy dependent sensitivity for SDP/Z/20

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