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524058 - MCA box

Order code: **5210.524058**

Cena bez DPH	1.191,00 Eur
Price with VAT	1.441,11 Eur

Parameters	
Sensors	Fyzika
Quantitative unit	ks

The MCA box is part of the CASSY-S system and together with suitable detectors (e.g. NaI(Tl) scintillation counters, silicon semiconductor detectors) and in combination with Sensor-CASSY (5210.524013) or Pocket-CASSY (5210.524006, 5210.524018), CASSY Lab (5210.524220) and a computer, it constitutes a multi-channel pulse-amplitude analyser for quick and easy recording of the spectra of radioactive decay products. The interaction mechanism in the detectors generates electrical pulses of various amplitudes which are proportional to the energy loss in the detector, unlike Geiger-Müller counter tubes. These pulses are converted to equivalent numerical values and the Sensor-CASSY module adds these values together in channels which correspond to the numerical values. The resulting energy spectrum represents the probability distribution of the detected radioactive radiation as a function of the energy. Consequently, an MCA is significantly different from a single-channel analyser, which consecutively sweeps the entire spectrum using a small window (channel) and is thus less suitable for low

activities. The MCA box contains a BNC input which allows the connection of external detectors, e.g. an NaJ scintillation counter (5210.559901) with detector output stage (5210.559912) or a semiconductor detector (5210.559921) or from (5210.55956) with discriminator-pre-amplifier (5210.559931). Additionally, their analogue output signals can be observed on an oscilloscope using a BNC-T adapter (5210.501091). The polarity of input signals and the amplitudes of different detectors can be adapted accordingly. The voltage supply for the discriminator pre-amplifier (5210.559931) and the detector output stage (5210.559912) can be obtained from the MCA box via a multi-pin socket. The detector output stage (5210.559912) allows the measurement of high voltage supply at the detector.
NaJ scintillation counters are particularly suitable for γ and β radiation, while silicon semiconductor detectors are appropriate for α and β radiation. For measurements with extremely weak radioactive sources (e.g. radioactively contaminated mushrooms, 137 Cs), the (lead) scintillator screening (5210.55989) with socket (5210.559891) can protect the scintillation counter (5210.559901) against the natural background radioactivity of the environment.
Use of two MCA boxes and two sensors makes it possible to conduct measurements of coincidence and anti-coincidence, so that, for example, spatial and temporal correlation of the two γ particles produced by positron disintegration in a sample of Na-22 can be demonstrated.
Older detector output stages (5210.55991) and (5210.559911) can be used with the MCA box, but they do not allow measurement of high voltage and mechanically they do not match the socket for the scintillator screening (5210.559891).
The CASSY Lab software (5210.524220) permits the recording of measurements (including high-voltage measurement), the display and evaluation of any spectra simultaneously. Energy calibration occurs with one or two known energies and can be invoked for each curve individually or for many spectra simultaneously. Integration of any spectrum sections (e.g. photographic peak), fitting for the Gaussian distribution, addition and subtraction of spectra can all be utilised for evaluation purposes.

Technical Data:

- Resolution: 256 ... 2048 channels (8 ... 11 bits) per spectrum
- Storage depth: 2x109 events per channel (31 bit)
- Dead time: approx. 60 µs
- Energy linearity: < 3 % of final value
- Coincidence window: 4 µs
- Operating limit for external sensors: 0.5 ... 5 V according to the adjustment of the attenuator, positive or negative. Internal attenuator and polarity adjustable via software.
- High-voltage measurement up to 1.5 kV in connection with detector output stage (559 912)
- Dimensions: 92 × 92 × 30 mm