

ORDELA MODEL 1010X

POSITION-SENSITIVE PROPORTIONAL COUNTER

DESCRIPTION

The ORDELA Model 1010X is a miniaturized linear, position-sensitive proportional counter (PSPC) designed and manufactured by ORDELA, Inc. for applications in small-angle scattering experiments with low energy (4 to 20 keV) x-rays.

This PSPC uses resistance-capacitance position encoding, a method known for its extended life-time, reliability, and simplicity of operation.¹ The cross-section of the active volume is 8 mm deep, 8 mm wide, and 10 mm long. The counting gas is Xe-CH₄ at 300 kPa absolute pressure for high detection efficiency and good spatial resolution. The window is 0.5 mm beryllium for increased x-ray transmission. The counter body is made of aluminum to mitigate fluorescence in the x-ray range of interest.

The Model 1010X includes two low-noise preamplifiers, a high-voltage filtering circuit, and interconnection cables. In addition to these standard accessories, analog and digital data processing instrumentation for position decoding and background discrimination are available from ORDELA, Inc. upon request. For best signal processing with the Model 1010X, we recommend the ORDELA Model AIM-206 PSPC Position Decoder for pulse shaping, timing, pulse-height discrimination, and time-to-pulse-height conversion, a NIM/BIN power supply and an adjustable high-voltage power supply for biasing, and a multi-channel pulse-height analyzer for display and imaging.

¹. C. J. Borkowski and M. K. Kopp, J. Appl. Crystallogr. 11, 430 (1978).

PRELIMINARY SPECIFICATIONS

ACTIVE LENGTH:	10 mm
SPATIAL RESOLUTION:	200 pixels (picture elements)
PIXEL SIZE:	50 μ m for x-rays <8 keV
THERMAL NOISE:	30 μ m (fwhm) for an avalanche charge of 0.5 pC
DETECTION EFFICIENCY:	95% for 8 keV x-rays, 40% for 17 keV x-rays
WINDOW ABSORPTION:	50% for 4 keV x-rays, <10% for >8 keV x-rays
COUNT-RATE CAPABILITY:	2 x 10 ⁴ x-rays per second for 10% coincidence losses, maximum count rate 2 x 10 ⁵ x-rays per second
LINEARITY:	2% integral, 15% differential
LIFE-TIME:	10 ¹¹ x-rays per mm
BIAS VOLTAGE:	+1700 V
PREAMPLIFIER POWER:	\pm 12 V at 25 mA

