

ORDELA MODEL 1025X

POSITION-SENSITIVE PROPORTIONAL COUNTER

DESCRIPTION

The ORDELA Model 1025X is a linear, position-sensitive proportional counter (PSPC) system designed and manufactured by ORDELA, Inc. for applications in small-angle scattering experiments with low-energy (4 to 20keV) x-rays.

The PSPC uses resistance-capacitance position encoding, a method known for its reliability and simplicity of operation ¹. The active volume is only 8mm deep to reduce parallax distortion. The counting gas is Xe-CH₄ at 1500 torr pressure. The window is 0.25mm-thick beryllium to reduce window absorption and scattering.

The ORDELA Model 1025X includes two low-noise preamplifiers and pulse-shaping amplifiers, a high-voltage filter circuit, discriminators, and cross-over detectors for position decoding and background discrimination. These circuits are enclosed in a 10.2cm x 10.2cm aluminum box. This module generates two timing TTL pulses (START and STOP) in response to every detected x-ray within a pre-selected energy band. The only additional modules required for operation of the Model 1025X system are a high voltage bias supply, a $\pm 5V$ power-supply, a time-interval digitizer, and a multi-channel analyzer. These modules are available from ORDELA, Inc. upon request.

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

SPECIFICATIONS

ACTIVE LENGTH:	2.56cm
SPATIAL RESOLUTION:	256 pixels (picture elements)
PIXEL SIZE:	100 μ m (fwhm)
THERMAL NOISE:	50 μ m (fwhm) for a 1pC avalanche charge
DETECTION EFFICIENCY:	>90% for <8keV x-rays, 50% for 17keV x-rays
WINDOW ABSORPTION:	40% for 4kev x-rays, 10% for 6keV x-rays, <10% for >8keV x-rays
COUNT-RATE CAPABILITY:	10 ⁴ x-rays per second for 10% coincidence losses, maximum count-rate 10 ⁵ x-rays per second
LINEARITY:	$\pm 2\%$ integral, $\pm 15\%$ differential
INPUTS	
BIAS VOLTAGE:	$\approx 2kV$
PREAMPLIFIER POWER:	$\pm 5V$ at 250mA.
OUTPUTS	
START:	TTL, positive, 4V height, 1 μ s duration. Indicates valid x-ray

STOP:

detection.

Same as start pulse. Delay range 0-to- 2.56 μ s referred to corresponding stop pulse. (10ns per pixel sensitivity)

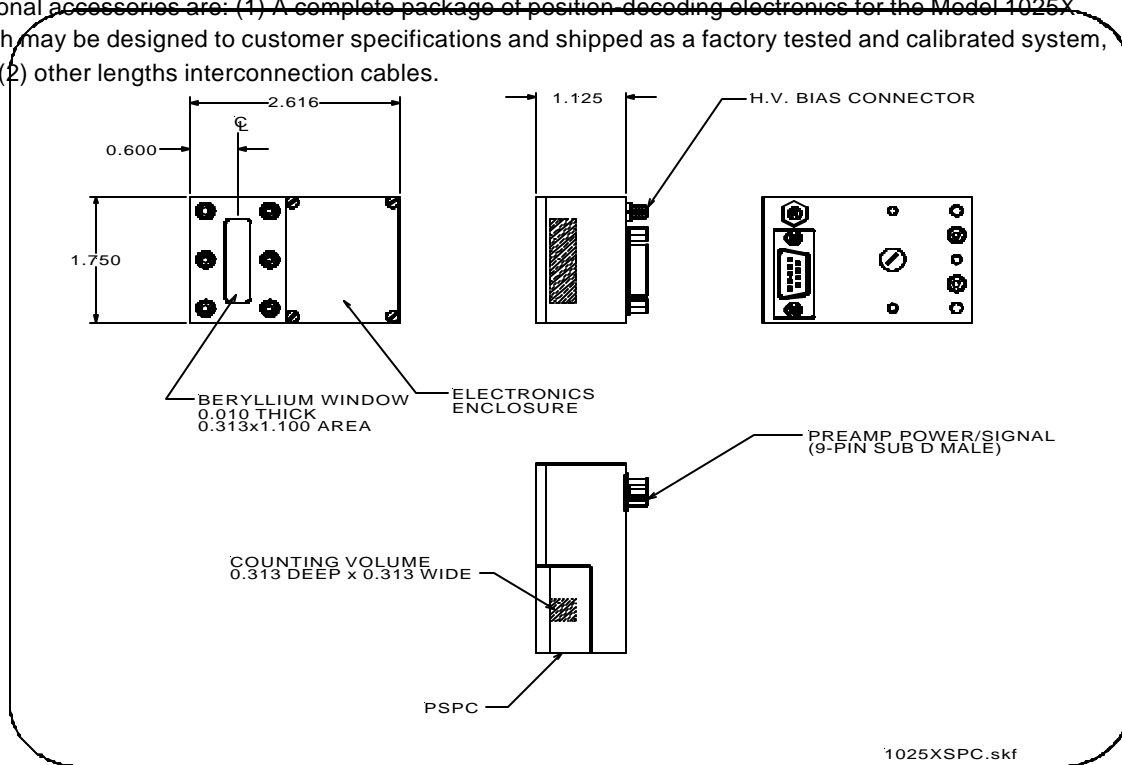
COUNTER CONSTRUCTION

BODY MATERIAL:	SS-304
WINDOW MATERIAL:	0.25mm-thick, hot-rolled beryllium
COUNTER VOLUME:	2.56cm x 0.8cm x 0.8cm
COUNTING GAS:	Xe-CH ₄ at 1500 torr
OVERALL DIMENSIONS:	4.5cm long, 6.35cm high, 9cm deep.

ACCESSORIES

Standard accessories, delivered with the Model 1025X at no extra cost are: (1) Two low-noise preamplifiers and pulse-shaping amplifiers, a high-voltage filter and distribution network, discriminators, and cross-over detectors. These units are installed, interconnected, and contained in the counter enclosure; and (2) 5m-long (15ft) cables for interconnection of the ORDELA Model 1025X with the power and bias supplies and the time analyzer.

Optional accessories are: (1) A complete package of position decoding electronics for the Model 1025X which may be designed to customer specifications and shipped as a factory tested and calibrated system, and (2) other lengths interconnection cables.



ORDELA Model 1025X outline and dimensions

WARRANTY

ORDELA, Inc. warrants its products to be free from defects in materials and workmanship for 12 months after shipment. No other warranty is included. Specifically, no warranty of merchantability or fitness for a particular purpose is implied. ORDELA's liability under this warranty is limited to repairing or replacing the product at ORDELA's option. This warranty is void if the product is operated improperly, disassembled, or modified other than in the ORDELA laboratory.