

ORDELA Model 8600A-LB ULTRA-LOW BACKGROUND, WINDOWLESS, GAS-FLOW, LARGE-AREA PROPORTIONAL COUNTER

- Ultra-Low Level Alpha Contamination Detection & Measurement on Large Area (>1000 cm²) Samples
- Rapid Alpha Screening for Multiple Samples
- Multi-wire Proportional Counter, self-contained preamplifier, amplifier, discriminator, high voltage power supply
- Ultra-low Background; <2 count per hour/1000 cm² achievable*
- PC-based counting system

DESCRIPTION

The ORDELA Model 8600A-LB is a windowless, gas-flow, multi-wire proportional-counter system designed and manufactured by ORDELA, Inc. for the detection and counting of ultra low-level alpha surface contamination on large-area samples, >1000 cm². The Model 8600A-LB system contains, as integral parts, the proportional counter, a sample chamber, the pulse shaping and discriminator electronics, the low-voltage bias supplies, and the high-voltage power supply. The proportional counter operates with P-10 (90% Argon + 10% Methane) in the flow mode at atmospheric pressure. The standard system is powered from 117 V, 60 Hz line power; other power inputs are available upon request. The output provides a positive TTL compatible pulse for each detected alpha particle. An included pulse counting system and a regulated P-10 gas supply are required for operation and measurement. The Model 8600DAS data acquisition system includes hardware and Windows[®]-based software to support up to four Model 8600A-LB detectors for pulse counting, data storage, and report generation.

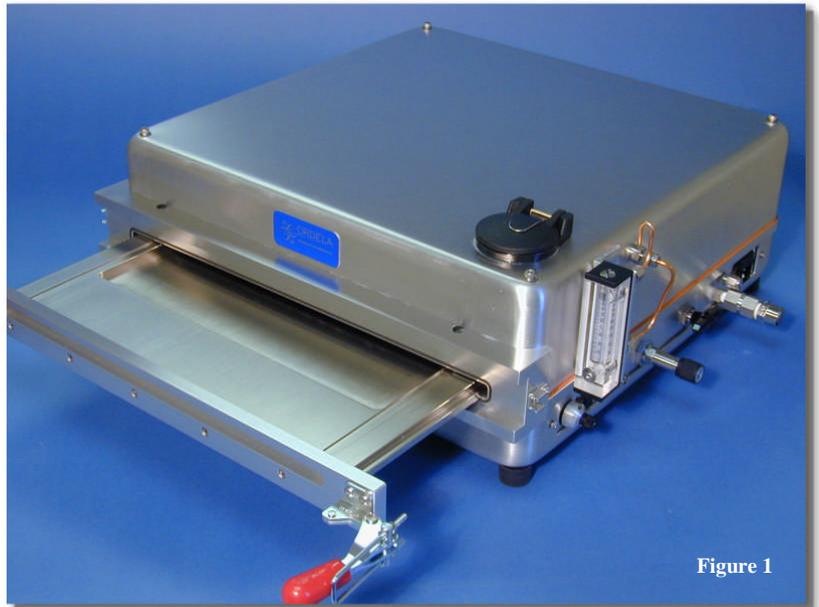


Figure 1

The proportional counter, sample chamber, and electronics measure 46 cm wide x 53 cm deep x 17 cm high. The counter enclosure is aluminum for protection and shielding (Figure 1). The electronics are integrated in the bottom of the counter enclosure. The sample-chamber access is located on the front of the proportional-counter enclosure, just above the electronics enclosure. The Model 8600DAS acquires data simultaneously and independently from up to four Model 8600A-LB counter systems.

The active volume of the proportional counter has a 38 cm x 38 cm sensitive area and is 7 cm deep. The active volume is entirely enclosed in copper and nickel to minimize alpha background. The windowless entrance cathode is a copper wire grid for optimum alpha particle transmission, low background, elimination of contamination and expensive window replacement. All components of the cathode/anode assembly are removable for easy cleaning and decontamination or replacement. The sample trays are interchangeable and may be replaced if background contamination levels become excessive. The maximum sample area that can be accommodated on the trays is 32 cm x 32 cm. The maximum sample thickness may vary up to 1 cm with no manual sample tray height adjustment required. The alpha background count rate of the Model 8600A-LB system with blank samples in the sample chamber is <2 count per hour* with the discriminator set to accept alpha particles with energies between 3 and 11 MeV. The detection efficiency is approximately 94% of the 2 π solid angle of the sample intercepted by the proportional counter.

The electronics enclosure contains the pulse processing circuits, a regulated low-voltage power supply, and the high-voltage power supply for biasing the proportional-counter anode. The pulse processing circuit contains a preamplifier, shaping amplifier, window discriminator, and output driver. All bias voltages are adjustable by internal controls. The upper level discriminator is set to 11 MeV and the lower level discriminator is adjustable from 1 to 11 MeV by a 10-turn potentiometer on the connection panel.

SPECIFICATIONS

ACTIVE SAMPLING AREA:	1008 cm ² (31.75 cm x 31.75 cm)
SAMPLE HEIGHT:	1 cm
SAMPLE CHAMBER:	O-ring sealed enclosure, open & close with two toggle clamps
COUNTING VOLUME:	38 cm wide x 38 cm deep x 7 cm high
BACKGROUND:	<0.002 counts per hour/cm ² for 3-11 MeV alphas*
ALPHA EFFICIENCY:	~94% of 2 π solid angle intercepted
COUNTING GAS:	Research grade P-10 (90% Argon + 10% Methane) gas flow at atmospheric pressure. Integral flow meter monitors out-gas flow in the range of 20-100 sccm.
GAS FLOW RATE:	80 sccm operating; 120 sccm to purge within approximately 1 hour
ENTRANCE CATHODE:	Copper wire grid
ANODE BIAS VOLTAGE:	1100 V (positive), internally set
CONTROLS:	Power and "on/off", lower level discriminator, Purge/Flow valve, Flow control needle valve
OUTPUT:	TTL compatible pulses (4 V pulse height, 1 μ s duration)
COUNTING GAS VOLUME:	Approximately 15 liters
OVERALL DIMENSIONS:	46 cm wide x 53 cm deep x 17 cm high
POWER:	100-240 VAC 50/60 Hz
WEIGHT:	28 kg
SHIPPING WEIGHT:	50 kg (with shipping case)

ACCESSORIES

Standard accessories installed within the Model 8600A-LB are:

1. One (1) electronics module consisting of a low-noise preamplifier, shaping amplifier, and window discriminator, all in the counter enclosure.
2. One (1) high-voltage power supply, factory set, and a high-voltage filter circuit for biasing the proportional-counter anode. One ± 5 V power supply for biasing the electronics module, and one +24V power supply for biasing the high-voltage supply, all in the counter enclosure.
3. One (1) internal gas distribution system.

Accessories delivered with the Model 8600A-LB:

1. One (1) Low Pressure P-10 gas regulator, Plumbing and Connections
2. One (1) sample tray, accepting 1000 cm² samples.
3. One (1) set of 3 m-long power- and signal-interconnection cables.
4. Pulse Counting System, TTL compatible.
5. One (1) shipping case for the Model 8600A-LB:
(Size: 69 cm W x 33 cm H x 69 cm D; Weight = 21 kg)

OPTIONAL EQUIPMENT:

1. One (1) Model 8600DAS 4-channel Data Logger Software
2. One (1) Model 8600A-Pb, Lead Counting Reference Sample. An ORDELA exclusive, the 500 cm² lead sample fits inside the standard counting tray and provides an effective way to periodically verify instrument operation.



Shipping case for 8600A-LB

**Typical backgrounds may vary from 1-10 counts per hour, depending upon ambient radon concentration, interfering electric fields, altitude, and purity of counting gas.*

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.