

ORTEC[®]

Alpha/Beta Counting Automatic Systems



Ultra High Performance Alpha/Beta Counting Systems
for Maximum Laboratory Productivity

AMETEK[®]
ADVANCED MEASUREMENT TECHNOLOGY

Alpha/Beta Counting Automatic Systems

ORTEC offers an extensive suite of **AUTOMATIC** alpha / beta counters incorporating either gas-flow proportional detector or dual-phosphor scintillation detector technologies. These automatic systems are ideally suited for applications requiring **relatively short counting times for a large number of samples**. For unattended operation, recommended counting times would range from one to two minutes for smears and air filters, and from 30 to 60 minutes for environmental and radiochemistry samples.

The following Application Guide can be used to select the optimal Automatic system for your specific market application as well as provide information regarding key features for each model.

Automatic Systems	Recommended Applications					Model Features				
	HP	SC	RC	CL	NP+	GL	LB	ULB	WL	GC
ASC-950-DP	✓				✓	✓				✓
IPC-650			✓	✓				✓	✓	
WPC-1050	✓	✓		✓	✓			✓		
WPC-1150-GFW	✓	✓		✓	✓		✓			
Application Key HP = Health Physics; SC = Smear Counting; RC = Radiochemistry; CL = General Counting Labs; NP+ = Nuclear Power, Fuel Cycle, Decommissioning and Disposal										

Features Key

GL – Gasless Systems

These systems do not require any connection to P-10 counting gas. They operate totally independent of any external supply other than power making them more portable than other counting systems.

LB – Low Background Systems

These systems offer great performance delivering beta backgrounds less than 2 CPM and alpha less than ½ CPM. The larger size detectors are the major contributors for the higher backgrounds.

ULB – Ultra-Low Background Systems

Ultra-low level alpha/beta counting systems usually refer to those with beta background counts in the 1–2 CPM or lower range for systems with a two inch detector. All two inch ultra-low level systems have total background performance of 1.0 CPM or better.

WL – Windowless Systems

Windowless alpha/beta counting systems offer one very distinct and important benefit, increased counting efficiency. Without the barrier formed by the window, and because the sample is actually placed in the active volume of the detector, counting efficiency can increase tremendously. Also, because the sample is in the active volume of the detector, there is no air gap present, and counting efficiency is far less dependent on planchet depth. A windowless system can reach a lower MDA in the same counting time as a windowed system, or reach the same MDA in a shorter amount of time.

GC – Gross Counting Systems

The term gross counter has several accepted meanings. In this application, gross alpha/beta counting systems are those that do not have ultra-low level background performance. Specifically, these systems do not have low beta background performance. The alpha background is usually equal to the alpha background of high performance systems. Gross counters are often used for remote locations, and where high beta counting sensitivity is not required.

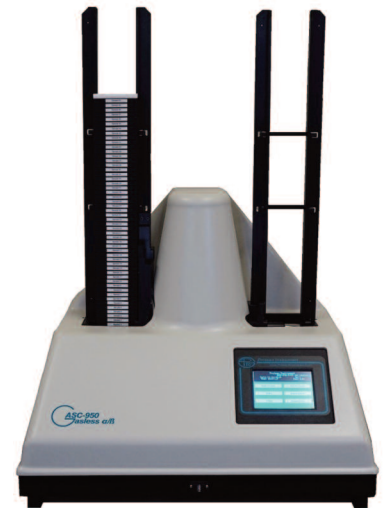
Alpha/Beta Counting Automatic Systems

ASC-950-DP

- Automatic Sample Changer
- Dual Phosphor Scintillator Detector
- Touch Screen Interface
- Lightweight Portability
- 2 in. (5.1 cm) Standard Planchet Diameter
- Radon Compensation For Air Filters
- Optional Cosmic Guard Detector
- 50 Sample Capacity (Optional 100)
- Gross Alpha/Beta Counter
- Gasless

The ASC-950-DP is a high-speed counter equipped with a dual phosphor scintillator type detector that supports gasless operation and easy portability. Cosmic background radiation reduction is possible with the optional Anti-Coincidence Guard Detector. DUO Express software allows for easy system programming, data management, and control chart maintenance. Multiple instruments can be connected for user convenience. This sample counter is ideal for standard Health Physics applications such as smears and air filters.

Includes 1 ea. PIC Link Cable, 1 each Standard Carrier Set, and 55 ea. 1/8 in Inserts.



Specifications

Optimized for Higher Energy Betas				
Typical Efficiency				
Source	Top	1/8" Bottom	1/4" Bottom	5/16" Bottom
Pu-239	34%	30%	24%	21%
SrY-90	45%	40%	35%	34%
Tc-99	24%	21%	19%	18%
Background				
Condition	Warranted (CPM)		Typical (CPM)	
	Alpha	Beta	Alpha	Beta
With Lead and Guard	<0.2	<25	0.05	12
With Guard, No Lead	<0.2	<30	0.03	15
With Lead, No Guard	<0.2	<55	0.08	35
No Guard or Lead	<0.2	<65	0.06	40

Optimized for Lower Energy Betas				
Typical Efficiency				
Source	Top	1/8" Bottom	1/4" Bottom	5/16" Bottom
Pu-239	35%	30%	24%	22%
SrY-90	47%	41%	36%	35%
Tc-99	26%	24%	20%	19%
Background				
Condition	Warranted (CPM)		Typical (CPM)	
	Alpha	Beta	Alpha	Beta
With Lead and Guard	<0.2	<25	0.05	13
With Guard, No Lead	<0.2	<30	0.05	23
With Lead, No Guard	<0.2	<55	0.05	41
No Guard or Lead	<0.2	<65	0.06	55

Instrument Specifications	
Sample Detector	2 in (5.1 cm) dia. ZnS + plastic dual phosphor
Window	Aluminized, 80 µg/cm ²
Sample Size	2 in (5.1 cm) diameter planchets, 1/8, 1/4, or 5/16 in (3.2, 6.3, or 7.9 mm) deep
Sample Transport	50 sample automatic changer with barcode reader and sample range 1-999
Count Modes	Alpha only, Alpha/Beta simultaneously, Alpha then Beta
Interface	Touch Screen
Data Export	USB PIC Link, USB Flash Drive
Power	110-240 V ac, 50-60 Hz Input
Dimensions	50 Sample: 36 in H x 23.5 in W x 23.5 in D (91.4 x 59.7 x 59.7 cm) 100 Sample: 54 in H x 23.5 in W x 23.5 in D (137.2 x 59.7 x 59.7 cm)
Weight	50 Sample: 110 lb (49.9 kg) 100 Sample: 120 lb (54.4 kg)

Options	Model
Cosmic Guard Detector, 5 lb (2.3 kg)	110-1073
Lead Ring, 50 lb (22.7 kg)	120-0010-ASC
Cart	120-0011
Standard Carrier Set (1-50 + QC + Routine)	120-0033-ASC
Carrier Set of 50 (Any Sequence)	120-0034-ASC
100 Sample Option (adds ~18 in. to height and 10 lbs.)	120-0036-ASC
50 Sample Stack, Stand, and Carrier Set	120-0075-ASC-50
100 Sample Stack, Stand, and Carrier Set	120-0075-ASC-100
Carrier Inserts, 50 ea., 1/8 in., 1/4 in. or 5/16 in.	140-0305
Planchet, 2 inch x 1/8 inch, set of 100	700-0007
Planchet, 2 inch x 1/4 inch, set of 100	700-0008
Planchet, 2 inch x 5/16 inch, set of 100	700-0009
Vista FC Health Physics Applications Software	
DUO Express Software (for operation in the Color Touch Screen Interface Mode)	

Alpha/Beta Counting Automatic Systems

WPC-1050

- Automatic Sample Changer
- 2 in. (5.1 cm) Standard Planchet Diameter
- Low Background Counter
- Standard 50 Sample Capacity (Optional 100 Sample)
- Cosmic Guard Detector
- 2.25 in. (5.7 cm) Pancake Gas Flow Detector
- Easy Window Replacement
- Counting Gas Loss Detection
- Radon Compensation for Air Filters
- Touch Screen Interface
- Gas Conservation



The WPC-1050 is a general purpose low background counting system, which is widely used for both health physics and radiochemistry applications. The WPC-1050 is an improved design of the previous WPC-9550 that incorporates the same dependable mechanical platform with improvements. DUO Express software allows for easy system programming, data management, and control chart maintenance. Multiple instruments can be connected for user convenience. This sample counter is ideal for standard Health Physics applications such as smears and air filters.

Includes 1 ea. PIC Link Cable, 1 each Standard Carrier Set, and 55 ea. 1/8 in Inserts.

Specifications

Instrument Specifications	
Sample Detector	2.3 in. (5.7 cm) diameter, pancake style gas flow proportional
Window	Aluminized, 80 µg/cm ²
Guard Detector	1 gas flow proportional
Counting Gas	P-10, 60 cc/min at 10 psi
Gas-PRO	Fail-safe P-10 monitoring system senses breaches in gas flow
Shielding	4 in. (10.2 cm) thick lead
Sample Size	2 in. (5.1 cm) dia. planchets, 1/8, 1/4, 5/16 in. (3.2, 6.3, 7.9 mm) deep
Sample Transport	50 sample automatic changer with barcode reader with sample range 1-999
Count Modes	Alpha only, Alpha/Beta simultaneously, Alpha then Beta
Interface	Touch screen
Data Export	USB PIC link, USB flash drive
Power	110-120 V ac, 50-60 Hz input
Environmental	10-40 °C (50-104 °F)
Dimensions	50 Sample: 33 in H x 32 in W x 25 in D (83.8 x 81.3 x 63.5 cm) 100 Sample: 51 in H x 32 in W x 25 in D (129.5 x 81.3 x 63.5 cm)
Weight	50 Sample: 430 lb (195 kg) 100 Sample: 440 lb (200 kg)

Performance				
Typical Efficiency				
Source	Top	1/8" Bottom	1/4" Bottom	5/16" Bottom
Pu-239	35%	31%	25%	24%
SrY-90	51%	47%	40%	39%
Tc-99	39%	33%	28%	26%
Background				
Condition	Warranted (CPM)		Typical (CPM)	
	Alpha	Beta	Alpha	Beta
With Lead and Guard	<0.1	<0.9	0.05	0.7

Options	Model
Planchet, 2 inch x 1/8 inch, set of 100	700-0007
Planchet, 2 inch x 1/4 inch, set of 100	700-0008
Planchet, 2 inch x 5/16 inch, set of 100	700-0009
Carrier Inserts, 50 ea., 1/8 in., 1/4 in. or 5/16 in.	140-0305
Cart	120-0011
50 Sample Stack, Stand, and Carrier Set	120-0075-50
100 Sample Stack, Stand, and Carrier Set	120-0075-100
Standard Carrier Set (1-50 + QC + Routine)	120-0033
Carrier Set of 50 (Any Sequence)	120-0034
Simplicity Software	Simplicity
Vista 2000 Radiochemistry Applications Software	
Vista FC Health Physics Applications Software	
DUO Express Software (for operation in the Color Touch Screen Interface Mode)	

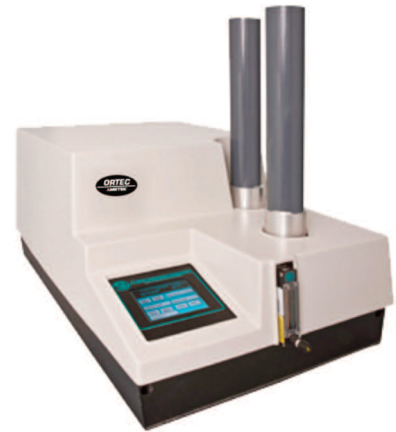
Optional Dual Anode Detector				
Source	Typical Efficiency			
Pu-239	38%			
SrY-90	53%			
Tc-99	35%			
Ni-63	15%			
Background				
Condition	Warranted (CPM)		Typical (CPM)	
	Alpha	Beta	Alpha	Beta
With Lead and Guard	<0.1	<1.0	<0.05	<0.7

Alpha/Beta Counting Automatic Systems

IPC-650

- Automatic Sample Changer
- 5.1 cm (2 in.) Standard Planchet Diameter
- Low Background Counter
- Windowless or Windowed Hemispherical Gas Flow Detector
- Standard 50 Sample Capacity
- Cosmic Guard Detector
- Touch Screen Interface
- Counting Gas Loss Detection
- Radon Compensation for Air Filters

The IPC-650-GFL and IPC-650-GFW low background automatics incorporate a built-in color touch screen interface and are targeted toward health physics and radiochemistry applications. The hemispherical, windowless, gas-flow proportional counter design of the IPC-650-GFL offers the best efficiencies available for low-energy beta and alpha particles. Each counter has the ability to program routines and QC charts on a PC running the included DUO Express software, then transfer the routines to the instrument using a direct-connect PIC Link cable.



Specifications

Instrument Specifications	
Sample Detector	2.25 in. (5.7 cm) diameter, hemispherical style gas flow proportional
Window	IPC-650-GFW: Aluminized, 80 $\mu\text{g}/\text{cm}^2$ IPC-650-GFL: Windowless
Guard Detector	1 large area gas flow proportional
Counting Gas	IPC-650-GFW: P-10, 60 cc/min at 10 psi IPC-650-GFL: P-10, 150 cc/min at 10 psi
Gas-PRO	Fail-safe P-10 monitoring system senses breaches in gas flow
Shielding	4 in. (10 cm) thick lead
Sample Size	2 in. (5.1 cm) dia. planchets, 1/8, 1/4, 5/16 in. (3.2, 6.3, 7.9 mm) deep
Sample Transport	50 sample automatic changer with barcode reader with sample range 1–999
Count Modes	Alpha only, Alpha/Beta simultaneously
Interface	Touch screen
Data Export	Serial RS-232
Power	117 V ac, < 0.2 A, 50/60 Hz 230 V ac, < 1.0 A, 50/60 Hz
Environment	10–40 °C (50–104 °F) 20%–90% humidity, non-condensing
Dimensions	27 x 22 x 34 in. (68.6 x 55.9 x 86.4 cm)
Weight	427 lb (194 kg)

Performance		
Typical Background		
Alpha	0.05 cpm (warranted 0.1 cpm)	
Beta	0.7 cpm (warranted 0.9 cpm)	
Typical Efficiency		
	IPC-650-GFW (Windowed)	IPC-650-GFL (Windowless)
^{210}Po	40%	45%
^{241}Am	40%	45%
^{230}Th	40%	45%
$^{90}\text{Sr}/^{90}\text{Y}$	55%	55%
^{99}Tc	35%	45%
^{137}Cs	40%	45%
Cross Talk		
Alpha-Beta	<0.1%	
Beta-Alpha	<0.1%	

Options	Model
Cart	120-0011
Sample Holder, 1/4 in. depth, stainless steel	140-0278-1/4
Sample Holder, 1/8 in. depth, stainless steel	140-0278-1/8
Sample Holder, 5/16 in. depth, stainless steel	140-0278-5/16
Planchet, 2 inch x 1/8 inch, set of 100	700-0007
Planchet, 2 inch x 1/4 inch, set of 100	700-0008
Planchet, 2 inch x 5/16 inch, set of 100	700-0009
Vista 2000 Radiochemistry Applications Software	
DUO Express Software (for operation in the Color Touch Screen Interface Mode)	

Alpha/Beta Counting Automatic Systems

WPC-1150-GFW

- Automatic Sample Changer
- 3.5 in. (8.9 cm) or 5.0 in. (12.7 cm) Diameter Pancake Gas Flow Detector
- Cosmic Guard Detector
- Low Background
- Custom Planchet Sizes Available
- 50 Sample Capacity
- Touch Screen Interface
- Counting Gas Loss Detection

The WPC-1150-GFW-3.5 and WPC-1150-GFW-5 low background automatics are gas-flow proportional counters equipped with either a 3.5 in. (8.9 cm) or 5.0 in. (12.7 cm) detector configuration. Each counter incorporates a built-in color touch screen interface and is targeted toward Health Physics and environmental applications. They are ideal for large diameter air filters used in high-volume air samplers.



Specifications

Instrument Specifications	
Sample Detector	WPC-1150-GFW-3.5: 3.5 in. (8.9 cm) dia., pancake style gas flow proportional WPC-1150-GFW-5: 5 in. (12.7 cm) dia., pancake style gas flow proportional
Window	Aluminized, 80 µg/cm ²
Guard Detector	1 large gas flow proportional
Counting Gas	P-10, 60 cc/min at 10 psi
Gas-PRO	Fail-safe P-10 monitoring system senses breaches in gas flow
Shielding	4 in. (10 cm) thick lead
Sample Size	Custom planchet sizes available, accommodates planchets up to 5/16 in. (7.9 cm) deep WPC-1150-GFW-3.5: active detector area of 3.5 in. (8.9 cm) WPC-1150-GFW-5: active detector area of 5 in. (12.7 cm)
Sample Transport	50 sample automatic changer with barcode reader with sample range 1–999
Count Modes	Alpha only, Beta only, Alpha/Beta simultaneously
Interface	Touch screen
Data Export	USB flash drive, RS-485
Power	117 V ac, < 0.2 A, 50/60 Hz 230 V ac, < 1.0 A, 50/60 Hz
Environment	10–40 °C (50–104 °F) 20%–90% humidity, non-condensing
Dimensions	25 in W x 36 in. D (62.5 x 91.4 cm)
Weight	1800 lb (816 kg)

Performance		
Typical Background		
	WPC-1150-3.5	WPC-1150-5
Alpha	0.3 cpm	0.4 cpm (0.5 cpm warranted)
Beta	1.5 cpm	4 cpm (5 cpm warranted)
Typical Efficiency		
²³⁰ Th	27%	
⁹⁰ Sr/ ⁹⁰ Y	63%	
⁹⁹ Tc	41%	
⁶³ Ni	20%	
Cross Talk		
Alpha-Beta	<0.1%	
Beta-Alpha	<0.1%	

Options	Model
Planchet, 2 inch x 1/8 inch, set of 100	700-0007
Planchet, 2 inch x 1/4 inch, set of 100	700-0008
Planchet, 2 inch x 5/16 inch, set of 100	700-0009
Vista FC Health Physics Applications Software	
Vista 2000 Radiochemistry Applications Software	
DUO Express Software (for operation in the Color Touch Screen Interface Mode)	

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Specifications subject to change
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Tel. (865) 482-4411 • Fax (865) 483-0396 • ortec.info@ametek.com
801 South Illinois Ave., Oak Ridge, TN 37830 U.S.A.
For International Office Locations, Visit Our Website

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