

VIRUS COUNTER[®] 3100



A novel approach for determining Total Virus Particle concentration that provides precise results in minutes, not days.

Get a quantitative picture of viral growth that's simple, compliant and cost-effective with:

Focus: The first and only automated technology specifically developed to rapidly quantify intact virus particles

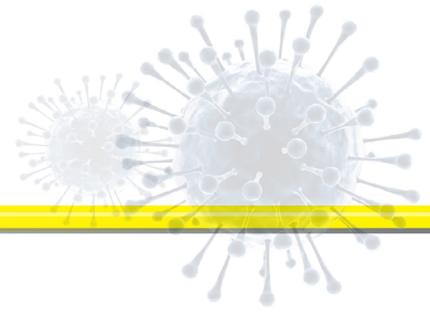
Speed: Results in minutes, not days or weeks required for other methods

Versatility: Multiple detection systems available

Flexibility: Use in standard mode or add a 96-well plate autosampler for overnight processing

Reliability: Rugged design for industrial settings, including 21 CFR Part 11-capable software for GMP environments





The Challenge

Virus quantification is a time-consuming and expensive bottleneck in any process that requires viral growth to create an end-product. Primary examples are the production of vaccines, virus for protein expression, development of antiviral compounds, and the creation of therapeutic viruses. Many of the most common virus quantification methods were developed in the last century, and their usefulness is limited by:

- **Time:** Days or weeks to get a result
- **Cost:** Hundreds or thousands of dollars per sample in both supplies and labor
- **Complexity:** Require significant training and experience to perform
- **Subjectivity:** Results are often non-quantitative, relying on interpretation by the technician
- **Precision:** High variability among replicates makes data analysis difficult



Virus Counter 3100



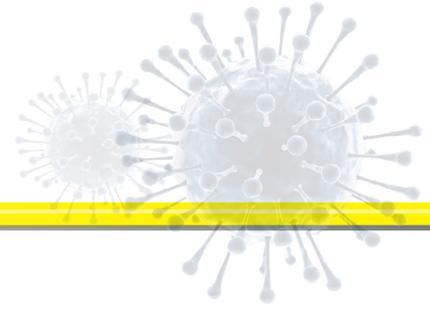
Virus Counter 3100 in standalone mode

Virus Counter Technology: How It Works

The Virus Counter is optimized for rapid virus quantification with an analysis time of less than 5 minutes by utilizing a dual fluorescence staining approach. With the Combo Dye system, viral genomes (and nucleic acids in general) and proteins in viral capsids are stained with a combination of equilibrium dyes that fluoresce in the yellow and red regions of the visible spectrum. This "combination" approach to staining allows for the detection of a wide variety of viruses using a simple no-wash assay. In the Virus Counter, by using proprietary fluidics technology, stained viral particles are hydrodynamically focused into a narrow nanostream and passed through a laser intercept point. Emitted fluorescence is detected on two separate optical channels where optical compensation hardware and software elements correct for any crosstalk between channels.

Virus Counter Capabilities

Minimum Sample Volume	100ul
Detection Range	1e5-1e9 vp/ml
Analysis Time	6 minutes
Searchable/Sortable Database	Yes
Centralized Database/LIMS	Yes
Baseline Calculation	Yes
Threshold Algorithm	Dynamic
21 CFR Part 11 Software	Yes
Autosampler Compatible	Yes



Fluorescence bursts on each channel are counted as a function of time. When fluorescence bursts are simultaneously observed on both the nucleic acid and protein emission channels, the “simultaneous event” is counted as an intact virus particle. The number of simultaneous events counted during the analysis time is used in combination with sample flow rate to calculate the concentration of virus particles per milliliter of sample. ViroCyt’s proprietary nanofluidics design ensures that sample flow rate is accurately and precisely measured in real-time, there is no need for an internal calibrant bead such as those used in typical counting assays.

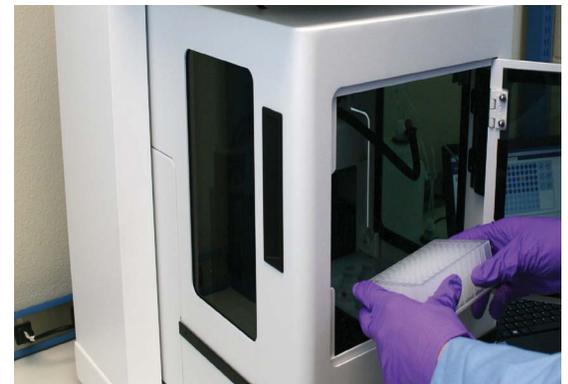


Virus Counter 3100 with Autosampler

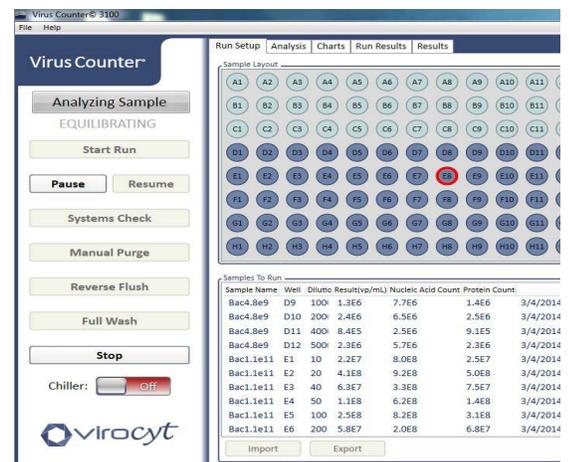
Enhanced Workflow

The addition of the optional 96-well plate autosampler allows overnight sample processing, dramatically reducing hands-on time. A newly added software interface provides unsurpassed instrument control and layout management, as well as the ability to create master templates. Other key features include:

- Walk-away automation
- Reagent and waste container volumes ensure up to 15 hours of continuous operation
- Compact vertical design minimizes bench space
- Secure cabinet enclosure isolates sample plate from environmental contaminants
- Plate cooling

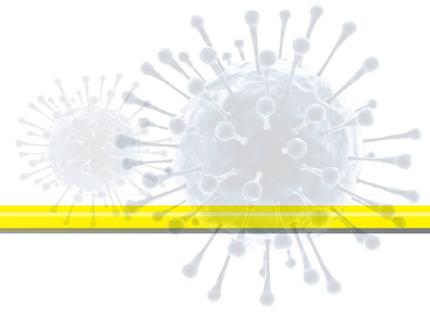


Autosampler allows overnight processing of up to 96 samples



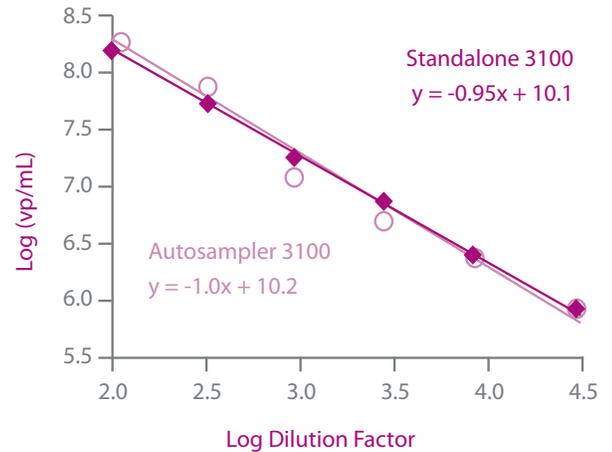
Sample Name	Well	Dilute	Result(vp/mL)	Nucleic Acid Count	Protein Count	Date
Bac4.8e9	D9	100	1.3E6	7.7E6	1.4E6	3/4/2014
Bac4.8e9	D10	200	2.4E6	6.5E6	2.5E6	3/4/2014
Bac4.8e9	D11	400	8.4E5	2.5E6	9.1E5	3/4/2014
Bac4.8e9	D12	500	2.3E6	5.7E6	2.3E6	3/4/2014
Bac1.1e11	E1	10	2.2E7	8.0E8	2.5E7	3/4/2014
Bac1.1e11	E2	20	4.1E8	9.2E8	5.0E8	3/4/2014
Bac1.1e11	E3	40	6.3E7	3.3E8	7.5E7	3/4/2014
Bac1.1e11	E4	50	1.1E8	6.2E8	1.4E8	3/4/2014
Bac1.1e11	E5	100	2.5E8	8.2E8	3.1E8	3/4/2014
Bac1.1e11	E6	200	5.8E7	2.0E8	6.8E7	3/4/2014

Intuitive software interface enables unsurpassed control



Improving Real World Processes

Adoption of ViroCyt Virus Counter technology has provided significant time and cost savings in multiple settings. Notable examples include the production and monitoring of egg- and cell-grown viruses, the optimization of protein expression using virus-based systems and the early evaluation of virus growth prior to large scale-up production processes. In case studies of customers using the Virus Counter, moving away from traditional approaches such as ELISA, plaque titer, qPCR, TCID50 and TEM, leads to substantial return on investment, often offsetting the initial capital expense within months of implementing the Virus Counter. In addition, the ability to move to the next step in the process is accelerated, thereby avoiding delays and getting product to market sooner.



Serial dilutions of Flu A virus quantified using Virus Counter 3100 in both standalone and autosampler modes show excellent correlation.

Enabling New Insights

Our goal as a company is to improve the way in which viruses are used by providing cutting edge tools that reduce the time and costs associated with getting these life-saving products to the marketplace. The Virus Counter is now being used by major biopharmaceutical companies, regulatory agencies, medical and life science research institutes around the world.

Versatility: More Than You Can Count!

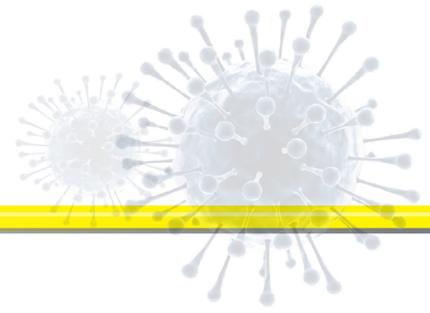
Due to the flexibility of the detection method used by the Virus Counter system, the list of viruses quantified continues to grow at a rapid pace.

Viruses Quantified Using Virus Counter

Arenavirus	HCV	Pox
Baculovirus	HSV	Rotavirus
BVD	IBR	RSV
CMV	Influenza	Rubella
Coronavirus	Lentivirus	Sendai
Coxsackievirus	Measels	Vaccinia
Dengue	MVA	VEEV
Ebola	Parainfluenza	VLPs
Enterovirus	Paramyxoviridae	VSV
Hazara	Pichinde	Yellow Fever

Summary

The Virus Counter 3100 is a breakthrough work-flow solution for the challenges of virus quantification. The combination of purpose-built hardware, software and reagents ensures that accurate and reproducible results are available in minutes, providing immediate insight and the ability to make critical decisions in real-time.



Learn More

Interested in finding out how the Virus Counter can improve your process? Visit www.virocyt.com/virus-counter or send us an email at info@virocyt.com.

Specifications

Component	Details	Dimensions (WxDxH)	Weight
Virus Counter	Compact, purpose-built system quantifies total intact virus particles in minutes	43.2 cm x 51.9 cm x 27.9 cm (17 in x 16.5 in x 11 in)	13.2 kg (29 lb)
Computer	Virus Counter compatible software in standalone, autosampler, and 21 CFR 11 versions; Windows OS	Standard laptop	2.3 kg (5.2 lb)
Autosampler	96-well deep well format; Temperature control	33 cm x 53.3 cm x 45.7 cm (33 in x 21 in x 18 in)	21.5 kg (47.3 lb)
Shelf	Space-saving, heavy duty aluminum shelf for placing Virus Counter above the autosampler	45.7 cm x 58.4 cm x 53.3 cm (18 in x 23 in x 21 in)	27.2 kg (60 lb)

Comparison of Virus Quantification Methods

Technique	Assessment	Precision	Time	Labor	Cost Per Sample
Plaque Assay	Infective Units	Poor	Days/Weeks	High	Low
Fluorescence Focus	Infective Units	Poor	Days	High	High
TCID50	Infective Units	Poor	Days/Weeks	High	Low
HPLC	Viral Antigen	Excellent	Days	High	High
Hemagglutination	Viral Antigen	Good	Hours	Low	Low
SRID	Viral Antigen	Good	Days	Moderate	High
ELISA	Viral Antigen	Good	Hours	Moderate	High
qPCR	Viral Gene Expression	Excellent	Hours	High	High
TEM	Viral Particles	Good	Days/Weeks	High	High
Virus Counter	Viral Particles	Excellent	Minutes	Low	Low