

Liquid Scintillation Counters

TRI-CARB 4910TR
Liquid Scintillation Counter

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Description

The Tri-Carb 4910TR liquid scintillation counter provides high performance and flexibility for multi-application and multi-user laboratories detecting radioactivity in life science research, environmental monitoring and/or health physics assays. Optional Packages are available for High Sensitivity Counting of low activity samples and Alpha Beta Separation for unknown or mixed samples.

Exclusive Standard Features

- **TR-LSC (Time-resolved Liquid Scintillation Counting)** for high sensitivity, low background liquid scintillation counting
- **Single/Dual labeled color-corrected DPM** provides the ability to determine absolute activity levels of the sample
- **QuantaSmart™ Software** a robust multitasking, easy networking environment with unlimited assays in a secure multiuser environment
- **SpectraWorks 2** spectral analysis package that determines optimal counting regions, and calculates figure of merit automatically
- **Replay** reanalyzes sample counts without recounting samples
- **Dynamic Color Correction** ensures accuracy of tracking lower energy sample spectra over a wide quench range
- **Auxiliary Spectrum Memory** stores rejected events for future analysis
- **Bi-directional Sample Conveyor** with a capacity of up to 408 (20 mL vials) or 720 (4 or 7 mL vials)
- **Varisette™** sample cassette for intermixing vial sizes without special adapters
- **Operational-status LED Indicator** for clear assay status updates at a glance

Additional Standard Features

- **Direct DPM** determines single-label DPM in any cocktail without the use of quench standards
- **Luminescence Detection Reporting** percent luminescence is flagged on printout to alert user of possible sample problems
- **30 Quick Count Protocol Flags** with the flexibility to define unlimited assays
- **Fold-away Ergonomic Arm** adaptable to enter data either sitting or standing
- **Built in Computer** with Windows 10 Operating System
- **Date and Time Clock** provides real time display and time-stamped printouts; battery supported
- **Anti-jam Recovery** protects samples, vials and the counting system from damage if obstructions occur
- **Automatic Power-fail Recovery** restarts counting when power is restored and the instrument has reinitialized itself
- **Positive Sample Identification** provides protocol number, cassette number, sample number, user-selectable printout and data file storage for the counting time and date on each sample

- **Multi-parameter linear Multichannel Analyzer (MCA)** offers an extended dynamic quench range and provides multi-parameter spectrum analysis to correct for luminescence, color quenching and background radiation
 - **¹³³Ba Low Energy External Standard Source and tSIE** (transformed Spectral Index of External standard) eliminates the need for repeat counting of the external standard and negates the effect of isotope on quench monitoring accuracy and precision
 - **AEC (Automatic Efficiency Control)** corrects for differential quenching effects in multi-label samples. The low energy spectrum of the external standard ensures accurate tracking of ³H, ¹⁴C and other low energy sample spectra over a very wide quench range.
 - **Precount Delay** permits dark adaptation of samples before counting
 - **Coincidence Resolving Time** enables optimized counting for a variety of liquid, solid, or bead based scintillators
 - **Spectral Unfolding** separates and displays the individual radionuclide spectra of dual label samples in color analysis of sample spectrum (requires color-corrected dual label DPM option)
 - **3D (Three-dimensional) Spectral Mapping** displays in color the quench standard spectra together with the spectrum of the unknown for single label DPM counting (requires color-corrected dual label DPM option)
 - **SpectraBase Counting and Data Management System** provides counting and storing of complete spectra
 - **Decay Computations** automatically calculates decay corrected DPM values for commonly used radionuclides
 - **Group PrioStat™ Interrupt Mode** prioritizes counting status and automatically restores the interrupted protocol
 - **Background Subtraction** calculated by sample, entered value or stored IPA background spectrum
 - **SIS (Spectral Index of Sample)** determines counting efficiency by analysis of sample spectrum
 - **Programmable Single Photon Counting** enables luminescence assay counting with optimized signal-to-background ratios to overcome problems associated with excessive luminescence
 - **Preset Time and Preset Error Coincidence Termination** optimizes counting accuracy in three counting regions
 - **Automatic Spectrum Plot** allows spectral documentation per sample
 - **Sample Screening** screens numeric fields on several criteria including background levels, a hard number or within a range of activities or values
 - **Printed Header** contains instrument serial number, user ID, and drive and path of all electronic stored data for GLP compliance
 - **Password Protection** prevents unwanted changes to saved assays
 - **Half-life Correction** adjusts for decay to any date and time
 - **Unit Conversion** activity can be reported in becquerels, microcuries, or picocuries
 - **Auto QA (Automatic Quality Assurance)** automatically prints reports for backgrounds, efficiencies, E2/B, and Chi-square values, results can be transmitted via RS-232 for archiving.
 - **Percent of Standard** calculations compared to single, dual or triple label samples
 - **Automatic Processing** provides automatic, protocol specific data processing from count data to final results requiring no exporting of data to off board storage devices or computers
 - **Independent Output Formatting**, provides flexibility in customizable data reporting for each protocol. Electronic data can be saved to disk in ASCII, RTF, or Microsoft® Excel® compatible format
 - **Computer-aided Diagnostics** to verify all system functions
 - **Sample Worklist** enables entry, editing and review of work lists for each assay
- ### Option Packages
- **Luminescence Correction and High Sensitivity Count Mode package** includes *Luminescence Correction* for improved data accuracy and quicker results and *High-Sensitivity Counting* due to reduced background.
 - **IPA and Luminescence Correction package** includes *Luminescence Correction* and *Enhanced IPA* (Instrument Performance Assessment) which allows the user to monitor performance, ensure data integrity, and document compliance
 - **High Sensitivity Count Mode package** includes *High Sensitivity Counting*, *Luminescence Correction*, and *Enhanced IPA*
 - **Alpha-Beta Separation package** includes *High Sensitivity Counting*, *Luminescence Correction*, *Enhanced IPA*, and *Alpha-Beta Separation* for efficient separation of Alpha and Beta counts in mixed samples
- ### Other Options
- **Printer** ink jet or laser jet
 - **Automatic 2D Barcode Reader** reads 2D barcodes to be used to create the sample work list (sample work list option required)
 - **Instrument Utility Cart** functionally designed general purpose laboratory cart that supports any PerkinElmer bench top system
 - **60 Quick Count Protocol Flags** with the flexibility to define unlimited assays
 - **Temperature Control**
 - **Enhanced Security** providing 21CFR part 11 compatibility

Physical Data

Dimensions	Height: 18.5 in (47 cm) Width: 40.5 in (103 cm) Depth: 32 in (81 cm)
	<i>with Temperature Control</i> Height: 18.5 in (47 cm) Width: 40.5 in (103 cm) Depth: 44 in (112 cm)
Weight	477 lb (217 kg)
	<i>with Temperature Control</i> 523 lb (238 kg)
Electrical Requirements	100-240 Vac 50/60 HZ 3- prong grounded plug
Power Consumption	<200 VA
Environmental	Operating ambient temperature 15 to 32°C (59-90 °F) Operating relative humidity 30% to 85%

Factory Performance Minimum

Energy Range	0-2,000 Kev
Efficiency Normal Count Mode (Minimum Acceptable)	³ H 0 - 18.6 keV 63%
	¹⁴ C 0 - 156 keV 95%
Observed Background, Normal Count Mode (Average)	³ H 0 - 18.6 keV 17 CPM
	¹⁴ C 0 - 156 keV 26 CPM
Figure of Merit (E ² /B), Normal Count Mode	³ H 1 - 18.6 keV 180
	¹⁴ C 4 - 156 keV 360
Figure of Merit (E ² /B), Low Activity/ High Sensitivity Count Mode	³ H 1 - 12.5 keV 300
	¹⁴ C 14.5 - 97.5 keV 780

Note: The efficiencies, backgrounds, and E²/B values for the Normal Count Mode were determined using PerkinElmer sealed large vial glass standards set P.N. 6008500 verified with NIST standard activity. The HSCM values are determined using PerkinElmer low level sealed large glass vial standards set P.N. 6018914 verified with NIST standard activity.

Safety, Radiated Emissions and Immunity: The Tri-Carb 4910TR has been tested and approved for safety, radiated emissions and immunity according to the standards of UL, IEC61010 and CE93.

In the U.S.A. the UL approval satisfies the requirements of 29CFR 1910.399.