

Gamma counters

A little magic to brighten your day

wallac



PerkinElmer
precisely.

Wallac 1470 WIZARD®

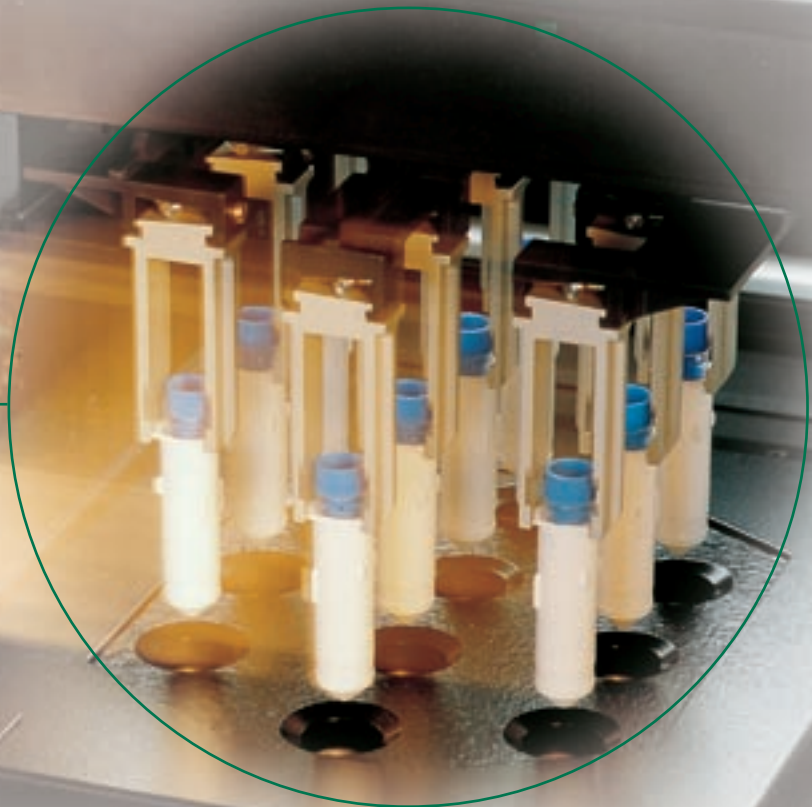
Well-type detectors and advanced for super

WIZARD®

is an automatic gamma counter with an improved sample changer system. This permits the use of well-type detectors – the key to superior counting performance.

With their almost 4π geometry, well-type detectors provide the best counting efficiency. Also, WIZARD's unique sample changer design means no crosstalk from samples on the conveyor.

In terms of performance, WIZARD is unbeatable. Over the following pages we will present more information on this and on WIZARD's many other exciting features.

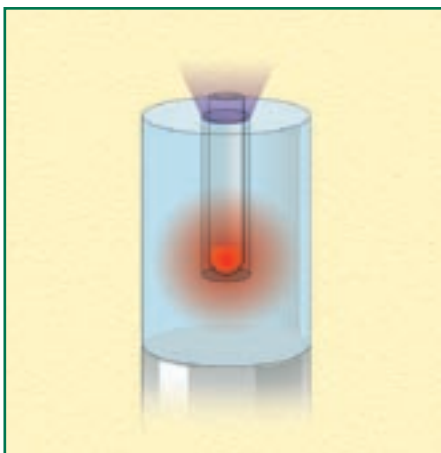


The robotic arm moves the samples from the cassette to the detector array as a single movement (above).

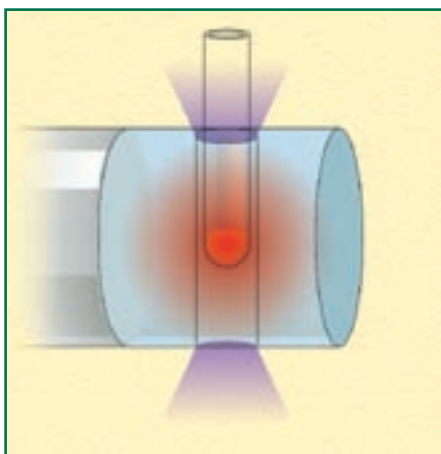
robotics

ior performance

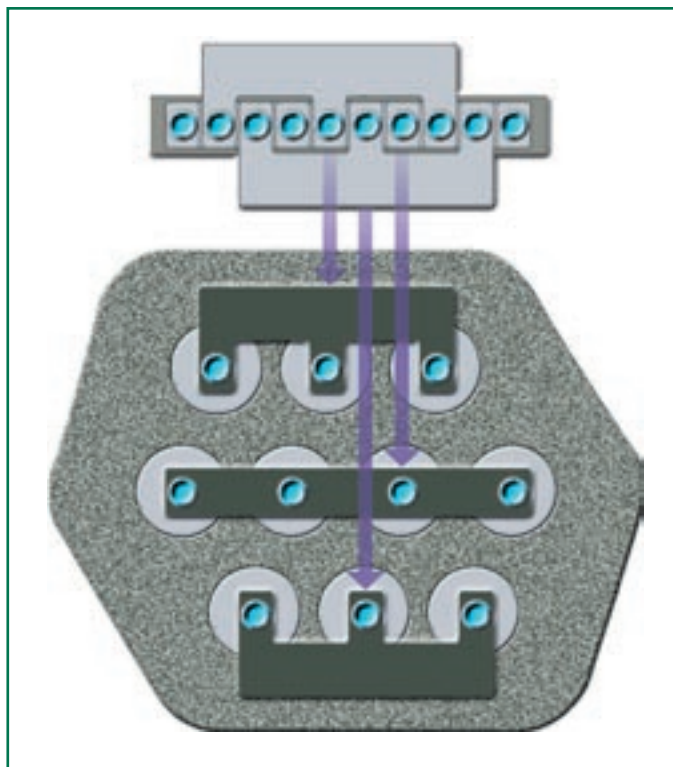
WIZARD's 4π detector geometry means that pulses are not lost through the bottoms of the tubes.



Well-type detector



Through-hole detector



The robotic arm consists of 3 solid elements which move the sample holders from a cassette to the detectors and simultaneously change the single-row alignment to the 3x4 arrangement of the detectors.

Meets every gam



WIZARD is available in 1000 sample (right) and 550 sample versions.



1, 2, 5 or 10 detectors

There is a WIZARD to fit every clinical and research application. WIZARD uses true well-type detectors for maximum efficiency and resolution.

EASY GLP

To comply with GLP, WIZARD monitors 9 detector parameters and provides documentation automatically.

Accepts all RIA tubes and vials

WIZARD accepts all RIA tubes and vials of any shape.

MCA technology

WIZARD incorporates a high resolution 1024 channel multi-channel analyzer dedicated to each detector.

Upgradable

1, 2 and 5 detectors models can be easily updated to higher throughput models. Software upgrades can be made simply by changing a 3.5" disk.

Built in data reduction

With its RIACalc WIZ, the comprehensive built in data reduction program, WIZARD is a complete, stand alone RIA counter. An easy to use, powerful package which not only supports all response programs but also includes a complete set of quality assurance software.

gamma counting need

Compatible with MultiCalc®

WIZARD is optimized for use with MultiCalc®, the industry standard laboratory data management program. With this system WIZARD forms part of the laboratory data system.

For all laboratory gamma work

With an energy range up to 900 keV and a powerful set of software WIZARD gives you error-free results from a wide range of applications, including all RIA and IRMA tests, screening assays, etc.

Ideal for Chromium Release work

WIZARD, with its unprecedented low crosstalk and 10 detectors is ideal for chromium release studies.

EASY STAT counting

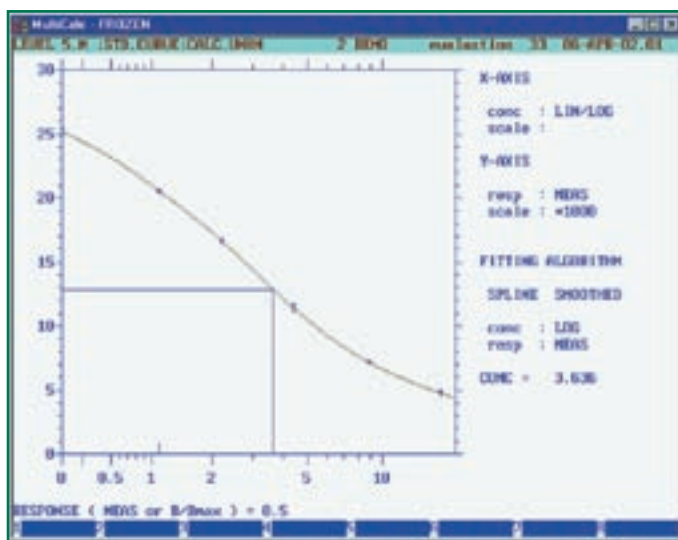
You can process STAT samples without touching the racks in the conveyor.

No volume adjust

The long well-type detector construction eliminates the need for separate volume adjustment procedures.

WIZARD® is compact

The 550 sample WIZARD is the smallest automatic 10 detector gamma counter in existence. Its 65×77 cm² footprint will help you make the most of your lab space.



MultiCalc® is the definitive immunoassay software package. It not only supports gamma counting, but all other technologies too.



WIZARD® compared with an automatic counter of conventional design. WIZARD not only offers superior performance, it is also far more compact.

Advanced techn



**Bar codes for protocols,
multifunction and positive
rack ID**

WIZARD uses a bar-code system for both counter control and sample ID. The ID clip has two labels, one for protocol call-up, the other for rack ID number or to call up special functions.



Accepts all RIA tubes and vials
WIZARD's 10-position racks, the same size as conventional LKB racks are suitable for tubes and vials of any shape up to 13 mm diameter, including the whole wide range of tubes used in centrifuges. In manual mode WIZARD accepts RIA tubes and vials up to 17 mm in diameter.

ology to give you so much more

No contamination hazard

Counterweights are a feature of old fashioned counters with through-hole detectors. They are a very common source of contamination. WIZARD with its unique sample changer needs no counterweights and is hence not prone to contamination.

Samples in separate carriers

Since samples are in separate carriers, this efficiently prevents samples from contaminating detectors. The easy to replace carriers are the only parts of the instrument which come into contact with samples.

Not susceptible to vial quality problems

With ordinary counters you have to be very selective in the vials you use. Uneven bases and other small irregularities in shape can easily cause a jam in the elevator system, and make a service call necessary. With WIZARD, all vials can be counted with the same high reliability.

WIZARD is a manual counter too

With a single command, WIZARD can be converted into a manual multidetector counter. In this mode of operation, sample volumes up to 5mL, such as LSC minivials may be measured or flow cell determinations made. Well diameter is 17 mm.



In 5- and 10-detector models a special tray for manual loading of samples is supplied.

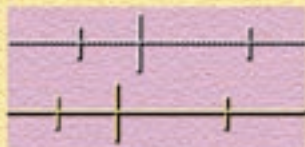
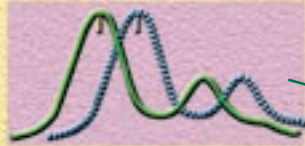
Gamma counting

Smoothing and peak finding

Noise is removed by digital filtering and the peak position is determined.



The initial peak position, optimum window coverage etc. are stored in an isotope library. They are “fine tuned” during normalization, each detector separately.



Peak comparison

The peak position is compared with that determined during normalization and the window position is adjusted by the deviation factor.

Counts for calculation

All pulses falling within the adjusted window are used for further calculations.

Dynamic normalization adjusts windows each time it measures a sample

High resolution MCA technology

Each individual detector has its own 1024 channel multichannel analyzer. Compare this with the 256 channel MCA, normally used in multidetector gamma counters and you've got four times the resolution. This makes results more accurate, especially in dual label counting.

Automatic normalization

This is effected by a normalization cassette for each defined isotope. All detectors are normalized with the same sample, so there is no need to have matched pairs of isotopes. All corrections (simultaneous detector to detector crosstalk, spillover, background, decay time and efficiency corrections) are calculated and applied automatically. For any nuclide, you only have to normalize once, whether it is used as a single or a dual label. Results are automatically corrected

for decay either to any date and time or to the start of the assay. In dual label counting different zero-times can be supplied for different isotopes.

Library directed

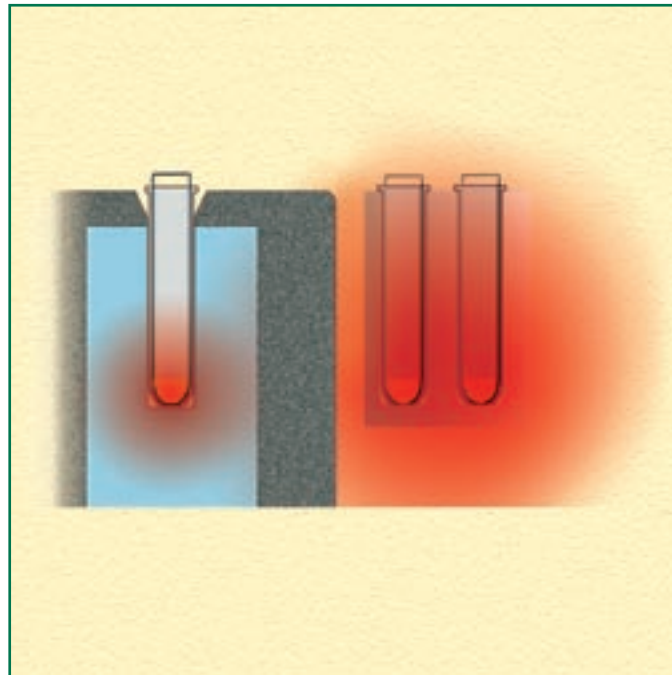
Dynamic Normalization WIZARD counters employ Dynamic Normalization to eliminate the effects of detector imbalance. This also takes care of drift in the performance of detectors, which may be caused by aging or environmental instability.

power like never before

Ideal for chromium release work

No crosstalk from conveyor

The major source of error when working with higher energy isotopes has always been the influence of the samples on the conveyor making results unreliable. Now WIZARD changes all that. There is no open elevator passages through which interfering radiation can pass to the detector. Each detector has 30 mm of solid lead against the samples in the conveyor. In WIZARD the crosstalk figures for chromium are two orders of magnitude better than in conventional multi-detector counters employing through-hole detectors.

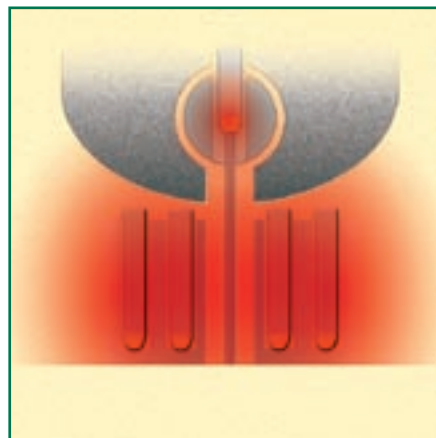


The WIZARD design totally prevents interfering radiation from samples on the conveyor.

No detector to detector crosstalk

The detector to detector crosstalk is eliminated by employing exclusive, patented crosstalk correction.

WIZARD, with its unprecedented low crosstalk figures and 10 detectors makes an ideal counter for chromium release studies.



In a conventional counter interfering radiation from the conveyor passes to the detector via the open elevator shaft and inadequate shielding.

Always there, **always**



Instrument control with clear built-in LCD display

Instrument control is via interactive VDU situated ergonomically immediately above the keyboard. There are no loose screens attached. For set up there is an IBM AT-type keyboard, located in a separate compartment.

ready when you need it

Built-in isotope library

With the built in isotope library there is no need to worry about window settings and half-life times. Simply call the isotope by name and WIZARD makes all necessary settings, automatically and in such a way that optimum counting conditions are achieved.

Select your nuclide and press one button

		⁶⁸ Ge	²⁰³ Pb
¹²⁵ I	⁴⁷ Ca	²⁰³ Hg	⁸⁶ Rb
¹¹ C	¹⁰⁹ Cd	¹²³ I	¹⁰³ Ru
⁵⁷ Co	¹⁴¹ Ce	¹³¹ I	¹²⁵ Sb
⁵¹ Cr	⁵⁸ Co	¹¹¹ In	⁴⁶ Sc
¹²⁹ I	¹³⁴ Cs	^{114m} In	⁴⁷ Sc
⁷⁶ As	¹³⁷ Cs	⁴² K	⁷⁵ Se
¹⁹⁵ Au	¹⁷¹ Er	⁴³ K	¹⁵³ Sm
¹⁹⁸ Au	¹⁸ F	²² Na	¹¹³ Sn
¹³³ Ba	⁵⁹ Fe	⁹⁵ Nb	⁸⁵ Sr
¹³⁸ Ba	⁶⁷ Ga	¹⁵ O	^{87m} Sr
⁷⁷ Br	¹⁵³ Gd	Open	^{99m} Tc

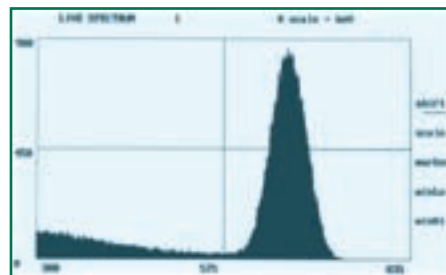
Samples always visible to user

With WIZARD, samples are never out of the user's sight, not even during counting. All parts of the counter are very easy to access and cleaning couldn't be easier.



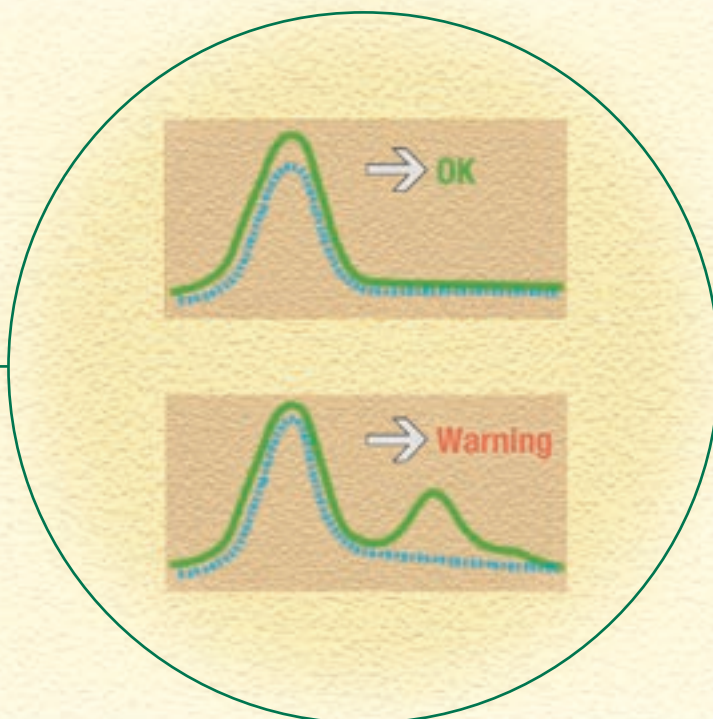
Live spectrum display

The counting spectrum of any detector can be selected for viewing on the VDU. Zooming is available to get an enlarged view of the whole 1024 channel MCA, calibrated as 1 keV/channel.



Complete quality control

Auto diagnosing checks the spectrum of every sample measured.



Our concept of GLP

PerkinElmer Life Sciences offers full compliance with the spirit of GLP, without placing any additional requirement on the user.

WIZARD assures the reliability of results in many ways.

Firstly the auto-diagnosing feature inspects the isotope spectrum each time a sample is measured. It immediately

warns of any condition changing the response from the expected. Secondly its EASY GLP allows automatic monitoring of a number of parameters of each detector and provides GLP compliance documentation on all parameters relating to instrument performance. Thirdly the RIACalc WIZ provides a large variety of QC tools, such as control plots and precision profiles.

By checking the following, WIZARD picks up any error before you do

1. Detector energy resolution

This is the most reliable measurement of detector condition. Resolution, for a given isotope, depends essentially on the light production and collection efficiency. The more light photons produced, the less statistical variation there is and the better the energy resolution is. By monitoring this parameter we can predict detector failure long before this actually happens.

2. Background

GLP regulations require background to be recorded because an elevated value indicates that the instrument is contaminated. This is a common failing in many of today's counters where the sample tube comes into direct contact with the sample changer mechanism or a detector. In WIZARD counters the risk of contamination is eliminated by the protective holder system.

3. Absolute detector efficiency

This is determined for ^{125}I using the coincidence method. The method does not require calibrated sources (having a known DPM value).

4. Detector stability probability (Chi-squared test)

Statistically the radioactive decay obeys a Poisson distribution, the Chi-squared test compares the observed standard deviation with the theoretical one and provides a probability index to show how well these compare.

5. Calibration

Calibration follows peak position of the isotope. Because counting windows are adjusted according to this, the calibration drift does not indicate error in itself; rather it indicates the wear of the P.M.tube. If the calibration becomes excessive the P.M.T gain must be adjusted.

6. Relative detector efficiency, e.g. normalization

7. CPM values in a given window

8. CPM values in total energy range

9. Window settings if dynamic window setting is used

Fast, single button RIACalc WIZ

In day to day operation, WIZARD is designed to make operation simple. After the protocols are initially set up, all that's left to do is to load your samples onto the conveyor and press the START button. Results are calculated and QC files updated automatically.

Complete range of assays

The program includes all normal RIA/IRMA assays and screening programs. These include hepatitis screening, RAST, Renin, T3 uptake, dual label Shilling test, bound/free calculations and chromium release studies.

Wide selection of response programs

RIACalc WIZ supports all usual response programs, including linear, quadratic or cubic regressions, either weighted or unweighted, manual or automatic spline functions.

Complete quality control

All necessary quality control information is stored automatically. This is used to compare the quality of each individual assay run. Up to six levels of controls in 50 assays and 12 parameters in 125 assays can be stored. These may be followed in the form of graphical Shewart/Levy-Jennings or Cumulative Sum (CUSUM) charts.



Precision Profile and RER curves

Precision Profile and RER (response error relationship) curves can be plotted to indicate assay precision (%CV of the concentration versus the concentration) in different concentration areas. Quality control rules can be used to detect out of control situations automatically.

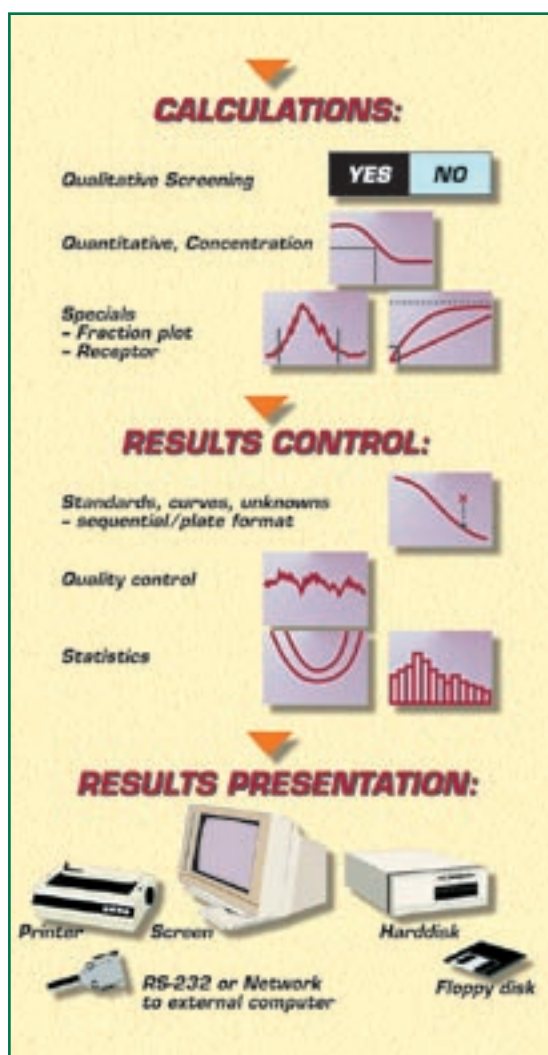
Population histogram

The population plot of unknown samples helps to recognize the samples outside the normal population or to establish normal ranges in certain demographic areas

Final results

User formatted results can be printed out or saved into a data logger. From the data logger they can be sent to another computer, automatically on line.

With MultiCalc[®] you can meet all special requirements



MultiCalc[®], multisystem data reduction

MultiCalc is a software package for external PC, suitable for clinical and research laboratories to measure immunological and other labelled assays. MultiCalc is not limited to gamma labels but works with beta counters, fluorometers, luminometers, etc. too. For clinical laboratories MultiCalc offers uniform data evaluation and QC for all immunoassays regardless of the type of label used.

Supports all evaluation programs

MultiCalc supports all response programs and fitting techniques, including 5 parametric logistic fit, cubic regression and automatic spline. It is designed to perform all RIA/IRMA and related gamma procedures, either single or dual label. It can also perform receptor assays, fraction plots or assays where each unknown has its own curve to be calculated.

MultiCalc[®] PC network

From one to five counters can be connected to a single MultiCalc PC or several workstations running MultiCalc can be connected to a PC server to form a network. Dedicated data files, such as QC files, may reside in the server and be accessed by one or several workstations.

The MultiCalc PC network offers freedom as to the number of workstations and the instruments connected as well as a secure and easy method of working with data. The MultiCalc PC network may be an independent system or it may form one or more local area networks (LANs) which are part of a bigger system.

Automatic communication with mainframe computers

MultiCalc may communicate automatically with other computers. It can, for example, receive worklists from another computer, add the results to the list and send them back, either directly or with manual acceptance.

The communication may take place automatically after each completed assay batch.

Total programmability

MultiCalc offers total programmability. All program settings can be changed to fully comply with the customer's needs. Output format, for example, is fully programmable. New output formats can be made and connected with a full set of arithmetical, logical, statistical or conditional operators.

Programmable transformation

Preset transformations to standard curves can be freely modified with a comprehensive set of commands.

Programmable input

Input data can be freely modified before further processing.

Programmable QC rules

MultiCalc offers a special application language so you can write your own quality rules to detect out of control situations. The factory settings are Westgard Multi™ Rule for concentrations.

Ready for integration into any laboratory data system

WIZARD allows you total freedom in the selection, evaluation and transference of data. The RIA evaluation may take place internally, or in the external PC. Data can be sent to a serial or parallel printer or PC or you can use the built-in data logger to accumulate data without needing any external device.

Programmable Population Plot

MultiCalc offers a special application language to plot any result field, normal or user-specified, as a histogram. The factory settings are concentration values in patient samples. Dual plots are also possible.

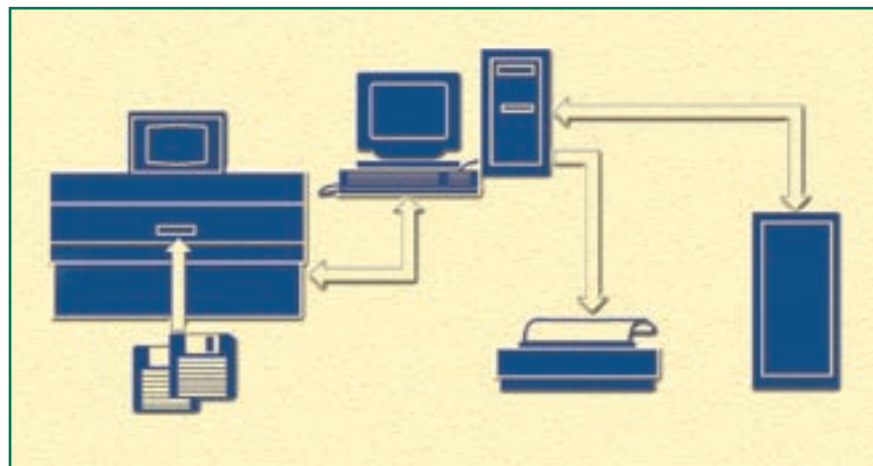
Precision profile with Overlays

Response error relationship can be plotted to follow dependence of measured response and its

error, both counting and total error. Precision profiles to follow dependence of % CV and concentration, both counting and total error. Overlaying and adding are possible.

Programmable worklist

Employing a unique worklist concept each individual patient result can be calculated according to patient-dependent data such as age, sex, weight or sample volume.

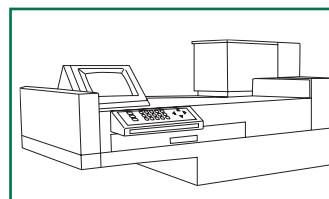


- Printer for hard copy record of counting data
- Datalogger for storage of counting data prior to further processing
- System PC for storage, further processing and application programs
- External PC or mainframe for storage, further processing and integration with laboratory data system

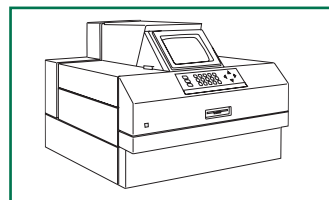
Specifications and ordering information

Instruments (CPM models)

- 1470-001 WIZARD 1 detector, 550 samples
- 1470-002 WIZARD 2 detector, 550 samples
- 1470-005 WIZARD 5 detector, 550 samples
- 1470-010 WIZARD 10 detector, 550 samples
- 1470-011 WIZARD 1 detector, 1000 samples
- 1470-012 WIZARD 2 detector, 1000 samples
- 1470-015 WIZARD 5 detector, 1000 samples
- 1470-020 WIZARD 10 detector, 1000 samples
- 1470-303 RIACalc WIZ RIA evaluation program (standard)



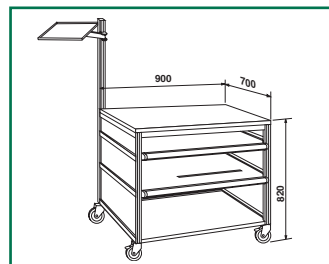
1470 WIZARD, 1000 samples



1470 WIZARD, 550 samples

Options

- 1224-310 MultiCalc Advanced data management system
- 1221-170 UTMAC terminal emulator for Macintosh
- 1221-144 Ultroterm terminal emulator for MS-DOS
- 1409-208 Floor stand
- 1224-534 Easy View Spectrum Analysis Program



1409-208 Floor stand



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