



TRITURUS®

Fully Automated EIA System



True open flexibility

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GRIFOLS



Fully Automated EIA System

TRITURUS®

The immunoassay analyzer of choice:
completely open, fully automated,
multi-test and multi-batch.



What is Triturus®?

Triturus® is a completely open and fully automated enzyme immunoassay analyzer capable of performing a variety of assays on a group of samples and processing several consecutive batches simultaneously. This analyzer performs all steps of any microplate ELISA test, regardless of the kit manufacturer.

What does Triturus® offer?

Time & Cost Efficiency

The preparation time is minimal thanks to its easy sample loading process and to its automatic workbench configuration. The processing speed is high due to its dual independent probes and multi-batch capability. Large cost savings can be achieved with the use of fixed needles, since disposable tips are optional.

Reliability

Triturus® hardware and instrumentation are highly precise. Its software is very stable as a result of constant in-house development and the release of software upgrades. Diagnostic Self-Test, alarms, Quality Control program and registry files all guarantee the correct status and functioning of the system as well as its verification.

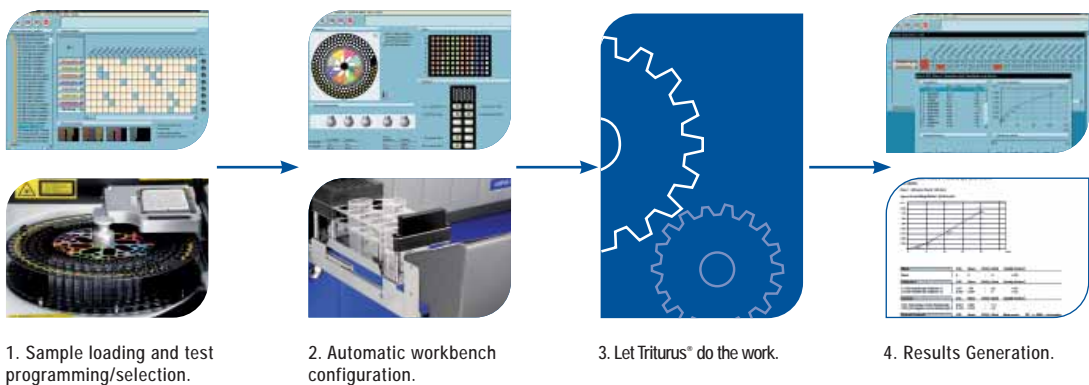
Flexibility

Triturus® offers absolute freedom regarding the use of any reagent brand. The system adapts to the user needs and to the different laboratory workloads thanks to its ability to perform several assays on a group of samples and process several consecutive batches simultaneously.

Ease of use

The software is very intuitive and self-explanatory. A series of logical interactive screens guide the user with clear instructions. No calculation is required from the user, thus simplifying the complex processing of the laboratory workload.

How does Triturus® work?



Software

FLEXIBLE, INNOVATIVE, INTUITIVE AND RELIABLE SOFTWARE

Triturus® offers complete flexibility in the processing of the laboratory's workload without changing the routine workflow. With Triturus® the laboratory manager has unlimited options to customize the test menu and the test protocols to fully meet the needs of any size clinical or research laboratory.

The Triturus® analyzer is known world wide for having the most innovative and easy-to-use operating software. A series of logical interactive screens guide the user through the program, thus allowing the processing of the complex daily ELISA workload in a comprehensive and absolute user friendly manner.



MAIN MENU

The main menu provides the user with the following applications:

1. Run option that permits the user to process a number of samples by selecting up to 8 pre-programmed tests per batch.
2. Programming option that allows for the programming and modification of test protocols.
3. Results option that enables the viewing and validation of obtained test results.
4. Quality Control program that allows the assessment of the veracity of the results obtained in the analysis.
5. Miscellaneous menu for other options, including maintenance operations and access to the technical service menu.



SOFTWARE-GUIDED WORKSHEET SET-UP

Worksheet preparation is simple and logical. The software guides the user through the steps to enter sample IDs, identify external controls, and select the tests to be performed on each sample in each batch. The preparation time is minimal as tests are quickly selected from an unlimited test menu and conveniently coded with a test-specific color. The worksheet also allows special handling options to be applied to specific samples such as replicate testing or multiple dilutions.



AUTOMATIC WORKBENCH CONFIGURATION

The Workbench, or Operator Setup Sheet, shows the layout of all the materials in a given batch utilizing color codes to guide the placement



Software



of standards, controls, reagents and wells by the operator for up to 8 assays in a particular batch.

Triturus® software automatically calculates the required volumes of each reagent and solution. Reagents can be labelled and safely stored in resealable reagent containers. Bulk solutions (wash, prime, rinse and waste) are on board and continuously monitored. The operator is notified of test requirements before walking away from the instrument.

STATUS SCREEN

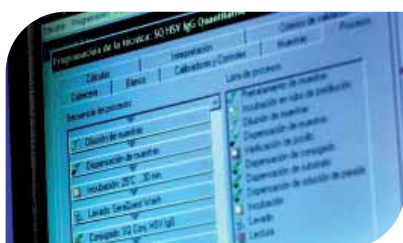
Upon starting a run a status bar with icons is displayed. Each icon corresponds to each of the pre-programmed steps. The current step being carried out is highlighted on the status bar.

A timer indicates the duration of the step being processed and time remaining until the batch is completed.

RESULTS SHEET

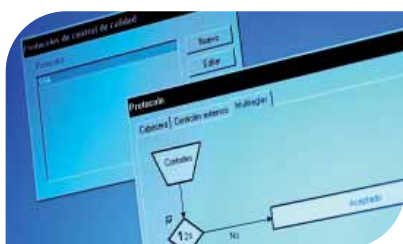
Allows the user to view and print out previously obtained and validated results. By selecting test information from the results sheet, the user has access to specific information about the test, including the calibration curve, the applied calculation method, quality control requirements and the results of the test for each sample, calibrator and control in terms of O.D. and concentration.

Software



For the calculation of the patient results, the following methods can be applied:

- Cut-off
- Single point
- Point-to-point
- Linear regression
- Polynomial regression
- Cubic spline
- 4PL
- Lin-Log
- Log-Log
- Logit-Log



ANALYZER SELF-TEST

Automatic self-test conveniently checks that all parts of the instrument are working properly. A status report is generated with the results.



QUALITY CONTROL

The Quality Control program records the evolution of data processed on Triturus®. For each parameter selected, a chart is shown for easy visual comparison of analytical runs. Triturus® QC program uses the Westgard Multirules procedure, to help decide whether an analytical run is within the specified acceptance criteria.

The end user can define the internal and external parameters. Triturus® accepts an unlimited number of QC protocols according to the needs of the user.

Internal parameters: The software allows programming specifications for the blank, calibrator and control parameters (OD, valid range and CV max).



Software

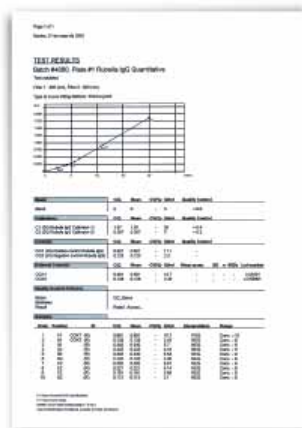


External parameters: External controls are processed in Triturus® as if they were samples. The performance is compared to the results from previous analysis.

Reports: Quality Control also evaluates the quality of test results by comparing the evolution of its parameters against previous analysis.

The QC studies can evaluate:

- The optical density evolution within an interval of tests performed.
- The concentration evolution within an interval of tests performed.
- The Levey-Jennings chart. The number of standard deviations from the mean for a given control within an interval of tests performed.
- CV on an interval of performed tests.
- The Cusum chart.



Hardware

FULLY AUTOMATED, MULTI-TEST AND MULTI-BATCH

Triturus® hardware automatically performs all steps of any ELISA test. Its design and the distribution of its components allow users to prepare and start batches while other batches are being processed. This unique feature optimizes the laboratory workflow.



HIGH SPEED PROCESSING

Two probes for the pipetting of samples and reagents.

FIXED NEEDLES AND/OR DISPOSABLE TIPS

Option of using fixed needles and/or disposable tips for pipetting samples, controls, calibrators and reagents. Triturus® holds up to 120 disposable sample tips and 36 disposable reagent tips.

HIGH PRECISION DISPENSING

The pipetting probes ensure clot detection and level sensing when using both fixed needles and disposable tips

HIGH CAPACITY

- 92 samples per batch
- 4 plates per batch
- 8 tests per batch
- 4 batches simultaneously
- Multi-batch capability



SAMPLE IDENTIFICATION AND BAR CODE READING

Positive sample identification using a built-in bar code reader. A sensor checks for samples, pre-dilution tubes, disposable tips, calibrator and control vials, diluent containers and number of wells on the microplate prior to testing.



Hardware

**MULTIPLE AND/OR SERIAL SAMPLE DILUTION**

Apart from the dilution programmed for the samples in the test protocol, additional dilutions of selected samples can be specified when setting up a run, indicating its source, dilution factor, volume and number of replicates.

OPTIMAL ASSAY PERFORMANCE

Triturus® minimizes the assay drift effect with:

- Twin probes to increase sample dispensing speed
- The option to start an incubation time at the dispensing of the first well
- The option to wash by strips

**SEROTHEQUE**

Triturus® can transfer a quantity of solution from the sample tubes in the carousel to a 96-tube plate to be kept in a serumarchive.

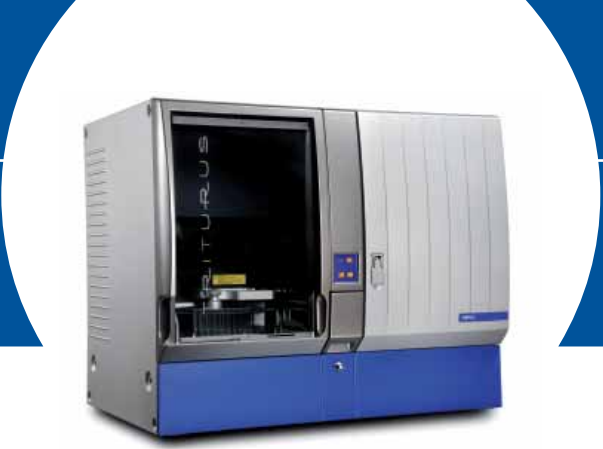
A printed report shows the location and identification of each sample on the plate and the exact volume dispensed.

PERFORMANCE CHECK KITS

- Reader check plate
- Performance check kit for washer and dilutor
- Incubator check kit

Together with routine automatic self-test, this offers a complete system for periodic checking of the analyzer for assured continued quality performance.





Triturus® specifications

SAMPLE STATION

Capacity	92 samples per batch 96 predilution tubes per batch 4 plates per batch 8 tests per batch 4 batches simultaneously
Controls + Calibrators / test	Up to 14
Reagents	12 independent positions for reagents 8 positions for sample diluents Automatic calculation of required volumes
Sample identification	Positive sample ID with built-in bar code reader
Bar code types	Code 39, Industrial 2 of 5, Codebar and Code 128
Batch verification	Detectors for the presence of: sample and predilution tubes, calibrator and control vials, disposable tips and number of wells on the plate.
Disposable tips	120 disposable tips for samples, controls and calibrators 32 disposable tips for reagents
Pipetting	Two probes for sample handling Two syringes per probe (500µL and 2500µL) Fixed needle and/or disposable tips Clot detection and level sensing with both fixed needle and disposable tips

INCUBATOR

Capacity	4 microtiter plates Optional covering of the plates during incubation
Temperature	Programmable from RT to 40 °C
Stability	± 1 °C
Mixing	Optional orbital shaking of the plates during incubation



WASHER

Plate washer	Eight channel manifold with 2 parallel needles. Removable and autoclavable. Cross-well washing
Wash type	Programmable, normal or continuous
Wash solutions	Four containers for solutions (4L each) One built-in waste container (4L) Optional external drainage connection Continuous liquid level monitoring of containers

READER

Capacity	One plate reader
Reading channels	Single channel for optimal inter-well reproducibility
Reading type	Monochromatic and bichromatic readings
Dynamic range	0 to 3 O.D.
Filters	Seven filter positions
Wavelengths	405, 450, 492, 550, 600, 620 nm + 1 free position

TECHNICAL SPECIFICATIONS

Supply Voltage:	100-120/220-240 V Frequency: 50-60 Hz Input power: 300 W Fuses: 2xT4AL 250V, 5x20 mm
Protection against electric shock	Class I
Installation category	Overvoltage category II (local level, appliances, portable equipment, etc.)
Certifications	CE mark
Dimensions	72cm deep x 105cm wide x 87cm high
Weight	120 kg

What makes Triturus® unique?

1. Diagnostic self-test with report ready to attach to the logbooks, in accordance with ISO and Standard Operating Procedures (SOPs).
2. Positive sample identification with the use of a built-in barcode reader and automatic orientation of the sample test tubes.
3. The only system that allows the combination of assays with different protocols to be run simultaneously on one given sample or group of samples.
4. True Multi-Batch system with up to 4 different batches simultaneously.
5. Disposable tips are optional.
6. Automatic workbench configuration: colour coded layout with required diluent, reagent and wash solution volumes automatically calculated.
7. Automatic workbench check prior to starting the batch.
8. High speed processing thanks to the dual probe.
9. Multi-directional washing of the wells ensuring an optimal wash.
10. Flexibility to adjust curves and results with full traceability, in accordance with Good Laboratory Practice (GLP).

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