freedom evolyzer

Freedom EVOlyzer®

Tailor your platform for fully automated ELISA processing

Freedom EVOlyzer – the powerful ELISA analyzer

The Freedom EVOlyzer is a dedicated platform for automating microplate-based ELISAs, delivering accurate and reliable results with high efficiency. The instrument was created to increase the productivity of your workflow, and can be adapted to the changing needs of today's diagnostics laboratory.

No need to compromise

The Freedom EVOlyzer has been designed to suit many different laboratory demands – from small-scale laboratories performing many assays to test low numbers of samples, to high throughput screening facilities that analyze thousands of samples using a limited range of assays. The flexible workstation automates all common ELISA steps, including sample distribution, sample predilution, reagent pipetting, incubation, plate washing, optical density reading and result generation, without compromising operator safety. The Freedom EVOlyzer has been developed to meet the requirements of the IVD-D 98/79/EC.

Freedom EVOlyzer – the lab managers' first choice

The Freedom EVOlyzer was created to increase the productivity and efficiency of your facility and can adapt to the changing needs of today's modern clinical laboratory.

Higher productivity

The Freedom EVOlyzer automates ELISAs from start to finish, allowing work resources to be redistributed. Fast delivery of results is made possible through high speed processing and dual parallel arm design.

Reliable results

Each individual device in the Freedom EVOlyzer is designed and tested for highly accurate and precise operation. Integrated process control and results quality control, based on the Levey-Jennings charts and Westgard rules, are the foundations for generating consistent and reliable results.

Easily integrated

The built-in bidirectional ASTM (NCCLS LIS1/NCCLS LIS2, see description on last page) communication module allows seamless integration of the Freedom EVOlyzer with your local laboratory information system – no extra software is needed. Several input and output data formats are supported for easy integration with both front-end and back-end systems.

Freedom EVOlyzer – profit from the integrated ELISA solution

New benefits at a glance

The Freedom EVOlyzer makes the job easier, safer and more efficient – from initial sample identification to sending the results to the local laboratory information system – with features that facilitate the routine work in your laboratory. In addition, long walk-away times frees new capacities within your work place.

Continuous loading saves time

The Freedom EVOlyzer increases throughput with continuous loading of samples, so that new samples can be added onto the worktable as soon as the first batch of samples has been pipetted into the target plate. In this way, the laboratory can respond rapidly to changing sample loads on any given day.

Worktable monitoring ensures safety

The Freedom EVOlyzer closely controls all user interactions and confirms all load and unload actions taking place through a Worktable Loading Interface, which monitors access to each individual grid on the worktable using a magnetic sensor. Automatic barcode scanning and evaluation of the samples, loaded plates and reagent containers ensures complete process security.

Guided operation with intuitive software

The Freedom EVOlution™ Software Run Control is optimized for touchscreen operation and designed to be simple to use, requiring minimal training. The graphical user interface (GUI) guides you through every procedure, step by step, and the software keeps track of all the system's required maintenance tasks.

Processing modifications are easily made

After the initial sample scan and worklist download, you can make last minute changes to the worklist before starting the process.

Simple interaction with the operator

The worktable's integrated green and red lights simplify the placement of sample and reagent racks on the instrument. An acoustic signal and flashing lights will alert you whenever interaction with the system is needed.

Freedom EVOlyzer – beyond boundaries

A complete ELISA automation portfolio

This scalable platform is available in three basic worktable sizes and can automate a variety of ELISAs. The Freedom EVOlyzer's modular and flexible design offers comprehensive automated processing for all user needs – from small laboratories to high throughput screening facilities.

The workstation is able to handle a broad range of ELISAs and can automate reagent kits from various manufacturers.

Less validation work

All Freedom EVOlyzer sizes use the same standard Tecan hardware and software components, including Tecan's Sunrise™ reader and HydroFlex™ washer instruments. This allows validation results to be reused, greatly reducing the amount of additional work required.

Lower service and support costs

The uniformity of the Freedom EVOlyzer family components means that spare parts, service and training are the same for all product configurations over the entire product range. This makes it easier for operators and application specialists to work with and maintain their platforms, and for a service organization to support a large and versatile customer base.

Increased process control

The Freedom EVOlyzer implements a range of safety features for increased process control and secure data handling.

- All input and output files are electronically signed, and assay configurations can be frozen to prevent unauthorized changes.
- User management supports CFR 21 Part 11 compliance, with three user group levels.
- Safety panels and door locks restrict access to the instrument during processing.
- The liquid levels of samples, reagents, wash buffers as well as system liquid and waste containers are monitored by sensors.
- Evaluation of barcode content, including lot expiry date, ensures reagent consistency.
- Liquid sensors help process security by detecting liquid levels, available volumes, and potential clots.

Freedom EVOlyzer – straightforward ELISA processing

The Freedom EVOlyzer is equipped with a number of features to ensure optimal processing of your assays, from start to finish.

1 Choose your preferred pipetting tips
The Freedom EVOlyzer can be fitted with either FEP-coated, washable stainless steel tips or conductive disposable tips – or even a combination of both. Choose the best option for your assay to optimize sensitivity and minimize sample carryover; both tip types are conductive for liquid level detection.

2 Keep track of all your samples
Tecan's PosID3™ positive identification barcode reading device scans and tracks all your samples, plates and reagents throughout the entire process, providing full sample traceability for your records.

3 Minimize manual microplate handling
A robotic manipulator (RoMa) arm moves all the plates to and from the Freedom EVOlyzer's various processing areas.

Set your own incubation requirements
Microplates can be heated in up to two incubators, each with six available slots. The incubators can be set to different temperatures and can also be equipped with a shaker option. The temperature of each slot is controlled independently, and the slots are closed for optimal temperature distribution and dark incubation. In addition, up to two ambient temperature incubators can be placed at the worktable, which also have six light-proof slots each.

**Define plate washing and reading steps**
The platform's HydroFlex system washes the microplates in full plate or strip mode. Up to four different washing buffers can be used. The weight of each bottle is monitored to prevent the liquid running out. A Sunrise microplate reader evaluates each assay at the end of the reaction, using the Magellan™ data reduction software. The instrument can also be used for verification of dispensing during processing.

Freedom EVOlyzer – let it guide you through your process

Sophisticated software for simple process control
Run Control, the Freedom EVOlyzer's software, is based on a straightforward GUI that guides you through the sample processing, step by step. The software is available in several languages and is optimized for touchscreen operation.

1   Sample loading
The software provides clear instructions to help you start processing your samples. After the samples have been scanned, you will be presented with a sample work order list showing each sample with its associated assay request. Simply add or remove assay requests as necessary and print out the list if required.
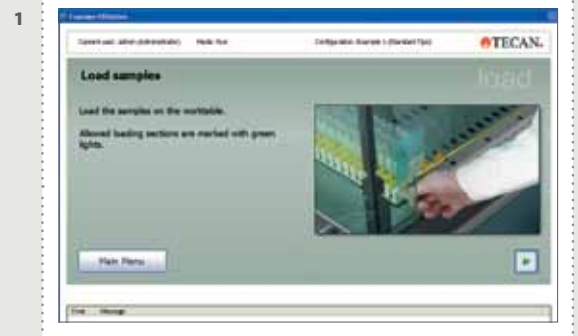
2   Shopping list
The software calculates a 'shopping list' based on the number of loaded samples and requested assays. This list includes the number of microplates or strips, required volumes of reagents and controls needed to fulfill the order.

3   Consumables loading
Whenever the Freedom EVOlution software™ asks you to load or unload a plate or reagent, you will be guided graphically to where the object must be placed or removed. The Freedom EVOlyzer can then verify the volume of the loaded reagents and controls after loading.

4   Maintenance
The Freedom EVOlyzer keeps track of all performed maintenance tasks and informs you when the next task is due. A wizard guides you through each maintenance procedure and a report is produced at the end, which can be printed and kept for your records.

Freedom EVOlyzer – tailor your configuration

A scalable and upgradeable system
The Freedom EVOlyzer's modular design allows to eliminate throughput bottlenecks by adding incubator slots or microplate storage space. The open worktable layout permits free placement of samples, reagents and pipetting sites, so every laboratory can optimize the use of the worktable according to the characteristics of the individual assays being performed.

Examples of two different Freedom EVOlyzer configurations

	Processing of smaller sample numbers	Processing of larger sample numbers
Example instrument configuration	100 cm worktable 2 pipetting tips 6 heated incubator slots 6 ambient incubation slots 16 plate storage positions Sunrise reader HydroFlex washer	200 cm worktable 8 pipetting tips 12 heated incubator slots 12 ambient incubation slots 32 plate storage positions Sunrise reader HydroFlex washer
Sample capacity per load	up to 96 samples	up to 512 samples
Particular advantages	• Strip handling, with up to 12 different assays in one strip plate. • Parallel sample and reagent pipetting within a strip plate. • Intelligent re-use of predilution plates. • Use of Eppendorf® micro tubes (from 0.5 to 2.0 ml) for low volume reagents.	• Continuous loading of samples, plates and reagents. • Parallel sample pipetting for rapid sample distribution in up to six plates. • Intelligent use of large shelf storage. • Automatic switch between reagent containers containing the same liquid.

The sample capacity and number of assays can be adjusted according to laboratory requirements.
Contact your local Tecan representative to find out how your assay panel can be accommodated on the Freedom EVOlyzer.

Freedom EVOlyzer – Technical specifications

Hardware features

Tip configuration	EVOlyzer 100: 2 or 4 tips; EVOlyzer 150: 4 or 8 tips; EVOlyzer 200: 8 tips Various combinations of different tip types are possible
Tip types	FEP-coated stainless steel tips and disposable tips with or without filter (200/1000 µl)
Syringe size	1000 µl

Liquid handling features

Pipetting precision (CV)	Volume	Fixed tips	Disposable tips 200 µl	Disposable tips 1000 µl
Standard volumes[1]	10 µl/100 µl	≤ 3.5 %/≤ 0.75 %	≤ 3.5 %/≤ 0.75 %	–/≤ 1 %

Liquid detection	Down to 50 µl of conductive liquid can be detected in round-bottom microplates on standard microplate carrier
Sample loading range	Variable, starting with 16 sample tubes per grid up to 640 sample tubes (40 grids) depending on the worktable size
Sample input formats	Sample tubes (tube diameter from approx. 10 up to 16 mm), microplates, strip plates or deep-well plates
Strip handling	Up to 12 different assays per plate
Predilution options	Common, serial or exclusive predilution, as well as several predilutions on one plate

Barcode identification

	Sample tubes, microplates, deep-well plates, strip plates, reagent containers
Supported formats	Code 39, Code 128, Codabar and 2 of 5 interleaved
Barcode evaluation	Reagent type, recording of lot number, lot expiry date

Incubation

	All incubators are suitable for dark incubation, and temperature is monitored
Ambient incubations	Freedom EVOlyzer 100: 6 positions; Freedom EVOlyzer 150 & 200: 6/12 positions
Heated incubations	Freedom EVOlyzer 100: 6 positions; Freedom EVOlyzer 150 & 200: 6/12 positions with or without shaking
Temperature range	RT-incubator: ambient temperature measured with accuracy of ± 1.5°C Heated incubator MIO-2™: from 5°C above ambient temperature up to 46°C. Incubator is calibrated at 37°C or 46°C with accuracy of +/- 0.5°C. The temperature accuracy over the plate +/- 1.0°C

Washer: HydroFlex™

Manifold	8-way or 16-way manifold
Wash channels	4 channels for wash buffers, wash buffer capacities: 2 x 2 l and 2 x 4 l with liquid level sensing
Wash modes	Strip or plate mode

Photometer: Sunrise™

Measurement range	340–399 nm: 0–3.0 OD; 400–750 nm: 0–4.0 OD
Wavelength selection	4 or 6 fixed interference filters (340–750 nm) or gradient filter (400–700 nm)
Measurement time	Single wavelength: 6 seconds; dual wavelength: 8 seconds

Software

	Supporting 21 CFR part 11, operating system Windows® XP SP3 and Windows 7 (64-bit)
Interface	Bidirectional interface ASTM[2] (NCCLS[3] LIS1[4] NCCLS LIS2) interface

Dimensions

	Freedom EVOlyzer 100	Freedom EVOlyzer 150	Freedom EVOlyzer 200
Height	910 mm/35.8"	910 mm/35.8"	910 mm/35.8"
Width	1520 mm/59.8"	1890 mm/74.4"	2490 mm/98"
Depth	800 mm/31.5"	800 mm/31.5"	800 mm/31.5"
Weight	210 kg	260 kg	290 kg

Power supply requirements	Power: 600 VA (Freedom EVOlyzer 100) and 1200 VA (Freedom EVOlyzer 150 & 200) Voltage: 100–120 VAC and 220–240 VAC, frequency 50/60 Hz
Operating conditions	Temperature: 15–32 °C/59–90 °F, relative humidity: 30–80 % (non condensing) at 30 °C/86 °F
Compliance	CE marked; compliant with the directive of in vitro diagnostic medical devices 98/79/EC, in the USA a Class 1, 510(k) exempt, medical device for diagnostic use

[1] Typical results pipetting plasma in single pipetting mode (1000 µl syringe) · [2] American Society for Testing and Materials
[3] National Commmittee for Clinical Laboratory Standards · [4] Laboratory Information System

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