



## TECHNICAL DATASHEET MULTIPARAMETRIC ANALYZER:

# HYPERLAB

Smart

W I N E A N A L Y Z E R



**HYPERLAB SMART** is a compact and versatile system designed to perform the enzymatic and colorimetric analyzes necessary for the control of Food & Beverage processes and the quality of the finished product in complete automation. The mechanical movements of the HYPERLAB SMART are guided by the latest generation stepper motors that are activated at the moment of switch on. The flow of liquids, guided by two peristaltic pumps and a diluter,

together with all the movement of the system is controlled by software.

Function's description: The reagent holder, the sample holder, the reaction segments, the high precision sampling arm with an AISI 316 steel needle and the needle washing station are housed on the work surface. The single arm is positioned to perform all the liquid withdrawal and dispensing functions. In addition, the large vertical movement allows the use of test tubes of different sizes. The sampler arm is driven by dedicated software on a special PC, this arm rotates 360° on both sides with a limit stop halfway up the reagent holder support. So that during the analysis cycle the needle is able to pass over all the reagent tanks, the reaction cuvettes and the sample holder tubes.

The preparation of the reaction product begins with the sampling, separated by an air gap, of the auxiliary reagent and the sample rate. Then mixture is dispensed into the reaction cuvette, a mixing phase, and the photometric reading in order to evaluate the interference due to the absorbance of the sample under examination.



### STEROGLASS S.r.l.

apparecchi in vetro soffiato  
forniture per laboratori chimici

Cap. Soc. € 103.000,00 i.v.

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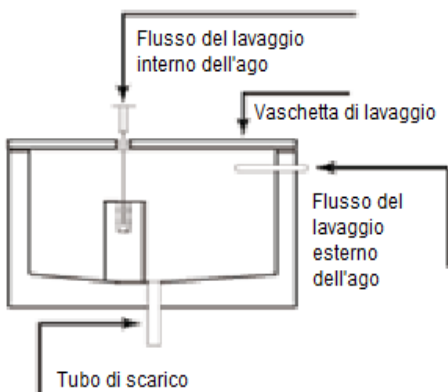
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Subsequently the sampling needle dispenses the second reagent which gives rise to the reaction in the reaction cuvette. The system, for the entire duration of the reaction, performs photometric readings to control the correct development of the reaction kinetics.

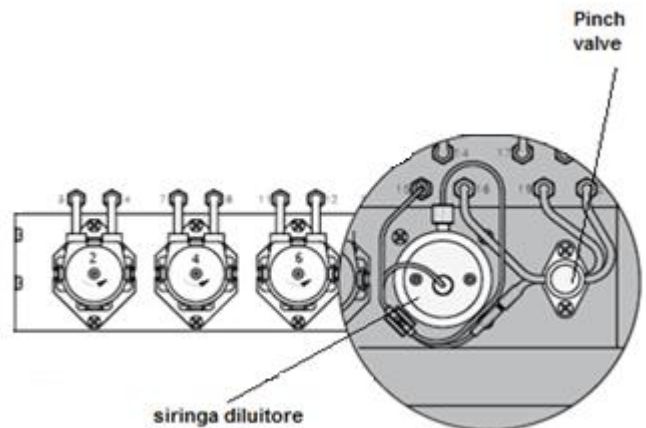
At the end of the time established by the method, the reaction product developed is read at the programmed wavelength and the absorbance recorded is transformed into concentration through appropriate calculation algorithms. During the execution of the process, the system intervals the various suction and dispensing cycles with washing phases suitable to eliminate any contamination between the various reagents and samples.



This diagram shows the elements of the **washing station**.

After each sampling and / or dispensing, the needle is washed internally and externally to remove any residual reagent or sample. This operation eliminates any contamination to ensure the high precision and accuracy of the analytical results.

The figure shows the **hydraulic panel of the system**, the position of the peristaltic pumps and highlights the high precision diluter connected to the pinch valve. two peristaltic pumps govern the sampling needle washing station, while a third peristaltic pump is dedicated to emptying the cuvettes once the photometric reading is complete. The pinch valve governs the flow of water for internal and external washing of the sampler needle. This set dedicated to fluidics satisfies all the hydraulic functions of the system. The peristaltic pumps are very easy to replace and the tube in which it flows into the washing liquid is made of neoprene, a material that ensures long life.



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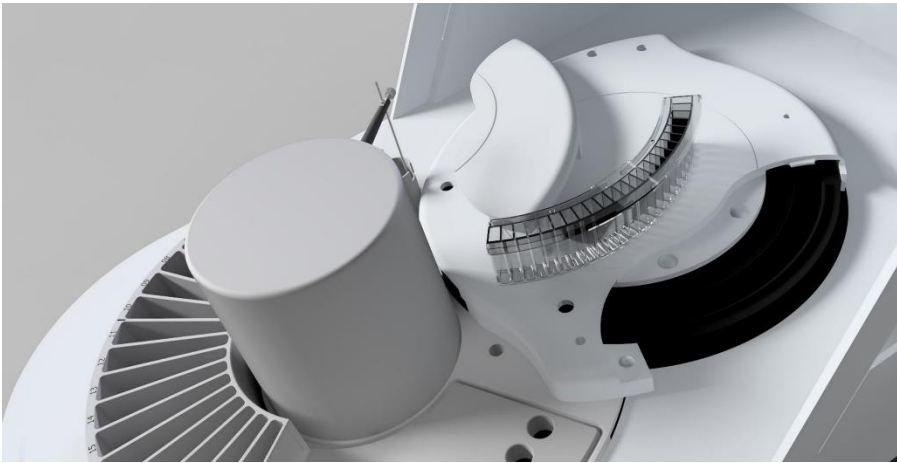
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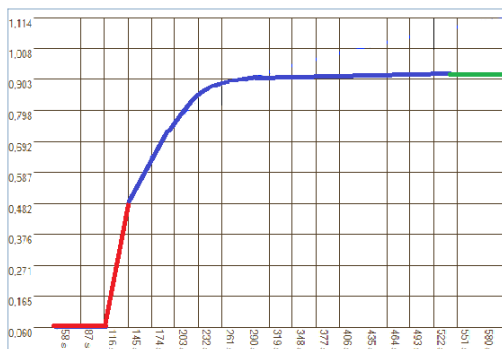


The figure shows specifically the reagent holder, the sample holder, and the reaction segments each consisting of 24 cells. The operator, according to his needs, can choose to configure the instrument with 10 samples and 20 reagents, or with 20 samples and 10 reagents. Everything you need is

supplied with the accessories box.

The removable sample holder can accommodate test tubes or cups with volumes from 0.5 ml to 1.5 ml. Therefore it is possible to manage multiple segments pre-loaded with other samples. The standards and controls are placed in the same plate as the samples and are managed as normal samples. The rotor positions the reaction cuvette to receive and incubate the reaction product. The reaction cuvettes, made of high optical quality plastic, are grouped into 4 segments of 24 cuvettes each, for a total of 96 reaction cuvettes. The sampling needle accesses the cuvettes through a slot in the rotor protection cover. When Hyperlab Smart processes the reaction product in incubation inside the reaction cuvette, aligned with the optical group, it is read photometrically every 29 seconds until the incubation time provided by the programmed test type expires. This allows you to observe the reaction kinetics. At the end of the analysis the reaction segments used can easily be replaced with new segments.

Analisi di un mosto contenente 150 g/l di glucosio/fruttosio.  
Cinetica della reazione enzimatica, enzima Esochinasi



When the analysis is finished, it is possible to check the **kinetic progress** of the test in order to guarantee the correct functioning of the system and the accuracy of the results. The graph shown in the figure represents the kinetic trend of a fermentable sugar test carried out on a red must containing 150 g / l of glucose / fructose. The red part of the curve shows the addition of the reaction reagent, the blue part represents the development of the reaction, finally the green part corresponds to the end point (stability) of the photometric reading.



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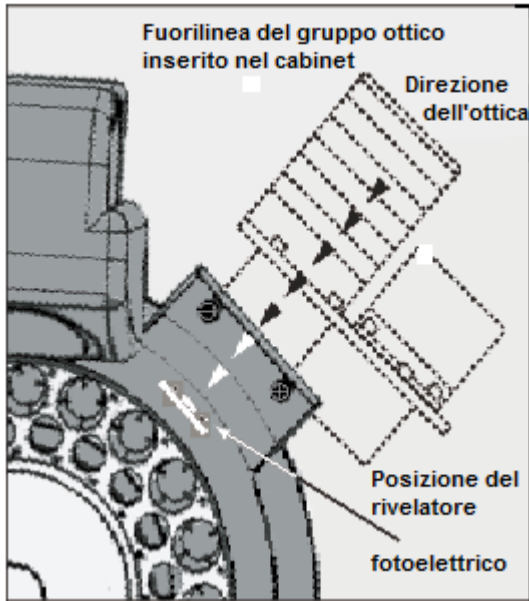
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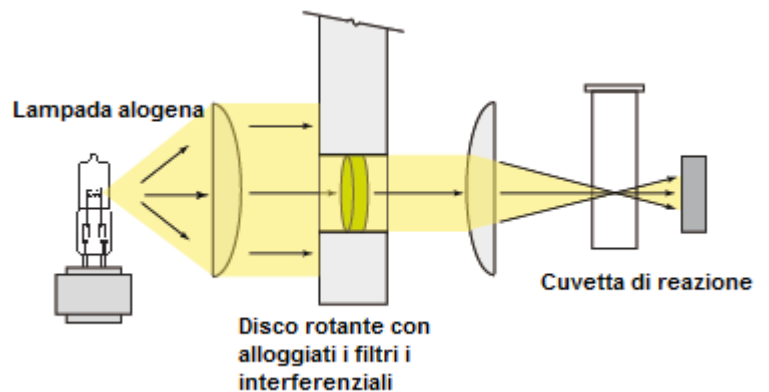
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#### Optical group:

- long-life halogen lamp
- interferential rotating disk for housing the filters
- 8 positions on the rotating disk for filters of various wavelength
- 1 optional position
- 2 focusing lenses for the light source
- photoelectric detector
- Latest generation signal amplifier

**The optical unit:** filter with rotating interference disc, light source, collimation lenses and photoelectric detector, is assembled in a single block and aligned with the reaction cuvettes. These reaction cuvettes are characterized by an optical path of 10 mm.



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**Hyperlab Smart** is a very compact system designed to optimize spaces.

It is also possible to manage 2 Hyperlab Smart with a single PC and dedicated software.

Thanks to its high performance, **Hyperlab Smart** allows:

- **Standardize the analysis by eliminating human error;**
- **Increase productivity by reducing the cost and time of analysis;**
- **Increase the number of checks and therefore the quality of production processes;**
- **Ensure effective and accurate control in order to intervene quickly, even on raw material suppliers;**
- **Optimize human resources in the laboratory;**



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#### Some features of HI, Hyperlab Interface, software:

- Windows operating system, simplified work functions, shutdown and power-up with programmable start-up, on-line application technical support;
- Information on time of programmed methods, selected analyzes, number of analyzes that can be performed with the available reagents and cuvettes, status of the calibrations and controls;
- Reagent and sample panel: Displays reagent position and volume, ability to add, remove, modify samples during work.
- Unlimited work lists to be used at the same time. It is possible to add or remove tests, perform automatic repetition of faulty tests and inspection of reaction kinetics for any single tests
- Calibrations and data processing, subtraction of reagent blank, from 1 to 8 calibrators for single test. Linear, non-linear regression with different models of data extrapolation.
- Possibility of recalculation of results with a new calibration and visualization of the new regression line produced by the recalculation.



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## TECHNICAL SPECIFICATIONS

MEASUREMENTS AND WEIGHT	depth length height	60 cm 37 cm 35 cm
SUPPLY	240/100 Vac, 50/60 Hz, single phase with mass. A main switch for the instrument. Fuse compartment: 2 Amp @ 230 Vac., 4 Amp @ 115 Vac. Electricity consumption: less than 200 VA (excluding external PC) Earthing resistance: less than 0.1 Ohm between terminal and the conductive part to the touch. dispersed electricity: less than 2.5 mA between the input power supply and the ground terminal.	
SAMPLING ARM	Sampling needle in AISI 316 polished steel. Capacitive level sensor.	
HYDRAULIC SYSTEM	Dilution syringe. Pinch Valve. 3 peristaltic pumps. Gatherer. One tank for washing solution and one for recovery emptying ration cuvette.	
DILUTER	High precision dilution syringe. Syringe capacity 350 µl, resolution 0.16 µl.	
REAGENT HOLDER SUPPORT	Removable plate, 10 or 20 jars of 50 or 20 ml, supports for 5 ml containers or 1 ml micro-cups.	
SAMPLE HOLDER SUPPORT	10 or 20 positions for 5 ml tubes or 3.5 ml cups.	
REACTION CELL ROTOR	96 cuvettes divided into 4 segments of 24 cells. Reaction cuvettes with 10 mm optical path and 350 - 500 µl reaction volume. 100 W heating element, temperature / safety sensor.	
OPTICAL GROUP	A 6 V / 10 W halogen lamp with extended UV emission. 2 focusing lenses in optical glass. 10 position interferential filter disc: 8 occupied by 340, 420, 520, 546, 578, 620, 650, 700 nm filters - 1 free position, 1 solid position for reading the dark. Direct reading of the reaction cuvettes, 10 mm of optical path $\pm$ 2 nm on the peak of the wavelength, bandwidth $\pm$ 5 nm.	



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PHOTO AMPLIFICATOR	Photoelectric detector. Signal amplifier. Response range from 340 to 900 nm. O.D. interval from 0 to 3.0 O.D . Linearity $\pm 0.5\%$ at full scale. Accuracy: 1% (0.050 to 1.500 Abs) typical 0.5%. Stability: daily reading of the offset, drift less than 1% / day.
COTROL	Real-time multitasking microprocessor. Easy access to electronics.
EXTERNAL NOTEBOOK	Windows® operating system. Archive of samples and analytical results.
PIPETTING	Volumes: sample 2-300 $\mu\text{l}$ ; reagent 5-500 $\mu\text{l}$ . Accuracy: <1 CV% at 10 $\mu\text{l}$ ; <0.7 CV% at 250 $\mu\text{l}$ . Mixing by means of the sample needle after dispensing.
REACTION	Reaction product volume 350 - 500 $\mu\text{l}$ .
SAMPLE DILUTIONS	Automatic predilution in reaction cuvettes, predilutions 1: 1 - 1: 4 - 1:10 - 1:40 - 1: 100 (analysis of sugars with musts up to 300 g/l glucose / fructose)
TYPES OF TESTS	End point, self blank end point, biochromatic end point, differential end point, sample blank end point, fixed time, kinetics, calculated methods, color 420-520-620 with zero dilution extrapolation. Ability to insert results from other laboratory stations in the report for printing and archiving in memory.
ACCEPTANCE	Random / Batch / Urgent.
PRODUCTIVITY	140 analyzes / hour with mono reactive methods. Maximum incubation + reading time: in mono reagent mode one reading every 18 seconds, in double reagent mode one reading every 29 seconds. Minimum endpoint accuracy 0.5 CV%.
START-UP	The start-up procedure starts when the system is turned on: it performs the self-test, the reading of the optical offset and the optical control of the cuvettes.
NEEDLE WASHING	Internal and external washing of the needle with a special solution after each single operation. High waterproof steel needle.



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CALCULATIONS	Reagent Blank Subtraction, reading against a calibration performed automatically by the system using 1 to 8 standards; linear, average and nonlinear regression. For the nonlinear there are three types of interpolation: cubic-spline, poly-linear, log-logit, four parameters. Counter factor reading with the possibility of inserting a 4-parameter mathematical algorithm extrapolated from the calibration curves. Standards and controls all positioned on the same sample pan. Recalculation of results. Correction related. Statistics. Results and samples archive.
MAINTENANCE	Scheduled procedures with daily / weekly / monthly deadlines.
PRINTS	Single test, complete sample, work list, methods, kinetics, quality control, automatic printing of the completed sample if required.
METHODS	<b>Organic acids:</b> Acetic Acid, Ascorbic Acid, Citric Acid, Gluconic Acid, D and L-Lactic Acid, D and L-Malic Acid, Pyruvic Acid, Tartaric Acid; <b>Sugars:</b> Glucose, Fructose, Sucrose, <b>Phenolic compounds:</b> Anthocyanins, Catechins, Total Polyphenols; <b>Ions:</b> Calcium, Copper, Iron, Magnesium, Potassium; <b>Other compounds:</b> Acetaldehyde, $\alpha$ -Amine and Ammonia Nitrogen (RAN), Chlorides, Colour, Ethanol, Glycerine, Free and Total Sulphite

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