#### BioSystems

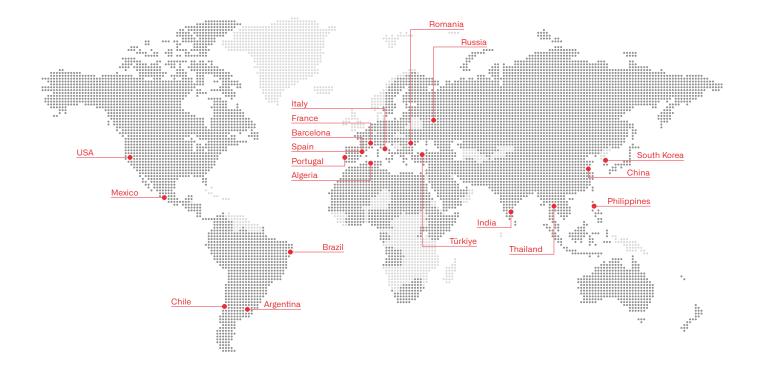
### Bioprocess monitoring analytical system





# A global biotechnology company that develops analytical solutions in the way you need.

## +40 years offering quality products



Argentina Brazil Chile China France India Italy Korea Mexico Philippines Portugal Romania Russia Spain Thailand Türkiye USA

## +100 Markets with distributor partners

25K Users served

+780 People in 17 countries

02 Manufacturing sites

45K Analysers over 40 years

# Summary

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# Bioprocesses analysis

## BioSystems Y15 – analytical system

BioSystems presents an automated and multiparameter system to quantify key analytes in bioprocess monitoring, like sugars, organic acids or nitrogenous substances.

BioSystems Y15 allows to monitor different bioprocesses in an efficient, reliable, cost-effective and user-friendly way:

- Bacterial
- Yeast & Fungi
- Mammalian & Vegetable cell cultures

All the applications can be tailored according to the user needs and results are comparable in front of other methods like HPLC or immobilized enzyme membranes (biosensor devices).

#### Using the wide experience in biochemical analysis for clinical diagnostics.



A compact analytical system with maximum robustness that adapts to your laboratory.

K
BioSystems Y15
analytical system
to monitor your
bioprocess.

# Technological innovation



#### Efficiency in lab automation

BioSystems Y15 is an **open analyser** that easily adapts to any need, and thanks to its **multiple configuration options**, it is possible to monitor different bioprocesses.

#### Reliable and validated analysis system

BioSystems Y15, in conjunction with the BioSystems line of reagents, is a **fully developed system**. It provides rapid and accurate analytical results and facilitates the users to optimise and control their processes.

#### **Minimum handling**

Reagents adapted and dedicated to the analyser, avoiding the manual liquid handling.



#### **Continuous loading**

Samples continuous loading to streamline laboratory tasks.

#### Stable onboard temperature

**BioSystems Y15c** is the version equipped with a cooling system, which increases the *onboard* stability of reagents and ensures a constant temperature during work lists.

#### Simple and intuitive interface

A user-friendly software, designed specifically for these analysis types. The flexible and simple interface make the Y15 a versatile analyser that can adapt to any need.



## Y15 / Y15c

#### Automatic Random Access Analyser

#### Dimensions



- BioSystems Y15 allows to measure metabolites directly form the clarified broth.
- Direct measurement in the rotor with a biochemical reaction that ensures high precision, repeatability, and reproducibility.
- No need of trained personnel, results directly in concentration.

Code

- Multiparameter, different analytes in the same sample at the same time.
- Dedicated reagents co-designed together with Y15, optimizing yield and offering a unique system.
- No need of replacing electrodes or membranes.
- Liquid reagent and calibrators included.
- Long stability of the working reagent.

#### Quantity

-	83106
-	83106C
1000 mL	12889
100 mL	BO13416
10 units	AC11485
1000 units	AC10770
10 units	BO11493
10 units	BO11494
10 units	BO13442
5 units	LA10429U

Intended use: automated analyser for the measurement

of different kind of analytes in bioprocesses.

Y15C analyser, with cooling system for 20 refrigerated reagents



### Highlights

Item

Y15 analyser

Reaction rotor

Concentrated system liquid Concentrated washing solution

Sample wells (pediatric cups) Reagent bottles 50 mL + caps Reagent bottles 20 mL + caps Amber reagent bottles 50 mL + caps

Halogen lamp Y15 6V/10W

#### THROUGHPUTS

Speed

Mean throughput

#### SAMPLE HANDLING

Positions for racks (reagents or samples)	4 or 2 in Y15c
Rack samples capacity	24 samples position/rack
Max. capacity of samples	72 or 48 in Y15c
Barcode reader	External
Size of primary tubes	Ø 13 mm or 15 mm (max. height 100 mm)
Sample well diameter	13 mm
Sample types	Up to 5 sample types to customise different ranges for the same analyte
Dispensing pump	Ceramic pump of high durability
Dispensing tip	Stainless steel 110 mm
Level detection	Capacitative
Sample pipetting volume	From 2 µL to 80 µL
Pipetting resolution	0.1 µL
Predilution ratio	From 1:2 to 1:100
Tip wash	Inside and outside

#### **REAGENTS HANDLING**

Volume of reagent bottles	20 mL, 50 mL
Reagents rack capacity	10 bottles of 20 or 50 mL
Cooled reagent	Yes, in Y15c. 20 reagents max.
Temperature range of cooler	10 °C below room temperature (at 25 °C)
Reagent volume	R1 volume, 10 μL to 600 μL R2 volume, 10 μL to 200 μL
Dispensing mode	Ceramic pump without maintenance
Pipetting resolution	1 µL
Tip wash	Inside and outside
REACTION ROTOR	
Reaction volume range	From 180 µL to 800 µL
Number of wells	120

150 cycles/hour

75 results/hour

Number of wells	120
Well material	UV methacrylate
Type of incubation	Dry without maintenance
Temperature	37.0 °C
Temperature accuracy	±0.2 °C

#### **OPTICAL SYSTEM**

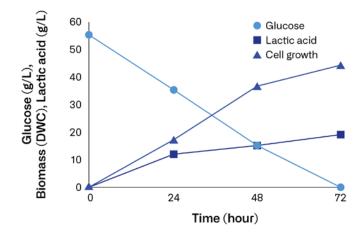
Light Source	Halogen lamp (6V, 10W)	
Lightpath	6 mm	
Wavelengths	340 - 405 - 420 - 520 - 560 - 600 - 620 - 635 - 670 nm (1 additional filter can be added by user)	
Wavelenght accuracy	±2 nm	
Spectral range	340 - 900 nm	
Photometric range	-0.05 to 3.6 A	
Photometric detection system	Silicon photodiode	
Internal resolution	<0.0001 A	
Baseline stability	0.004 A max., 30 minutes at 505 nm	
SIZE AND WEIGHT		
Size (w., d., h.)	840 x 670 x 615 mm	
Weight	45 Kg	
ELECTRICAL AND ENVIRONME	ENTAL REQUIREMENTS	
Mains voltage	115 to 230 V	
Mains frequency	50 or 60 Hz	
Electric power	500 VA	
Ambient temperature	From 10 to 35 °C	
Relative humidity	<75%	
Altitude	<2500 m	
FLUID REQUIREMENTS		
System liquid solution bottle	3 L	
Washing solution bottle	3 L	
Waste solution bottle	3 L	
MINIMUM COMPUTER REQUIR	REMENTS	
Operative system	Windows® 10 or Windows® 11 64 bit (x64)	
CPU	Equivalent to Intel Core i3 (8th generation)@3.10 GHz or over	
RAM	8 G B	
Hard Disk	40 GB or over	
Monitor minimum resolution	1280 x 800	
Connector of serial channel	USB	
LABORATORY INFORM ON SYSTEMS (LIS)		
Connectivity to LIS	Yes	

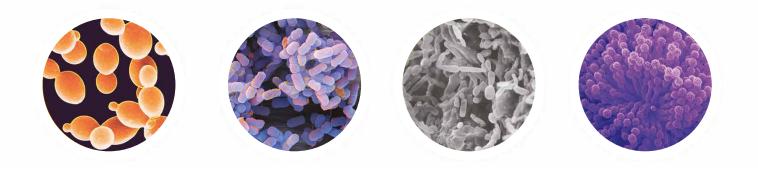


# Reagents

7

BioSystems enzymatic and chemical reagents work in a very sensitive and reliable way with no interference from other metabolites present in the culture broth. The system can detect small amounts of the analytes with great accuracy and predilute automatically. It allows to characterize the key biochemical parameters of the culture and understand the bioprocess\*.





\* All results obtained from BioSystems Y15 are meant to be validated according to the internal needs or regulations in each sector/industry.

## Enzymatic & chemical

D-GLUCOSE/D-FRUCTOSE         Hexokinase / Phosphoglucose isomerase         Y15 automated system         128 automated syst	Sugars & carbohydrates	Code	Presentation
Hexkinase / Phosphoglucose isomerase           YIB automated system         12800         120 mL           LACTOSE/D-GALACTOSE         P-Galactosidase / B-Galactose dehydrogenase / Mutarotase         YIB automated system         12822         120 mL           MALTOSE/SUCROSE/D-GLUCOSE/D-FRUCTOSE        Citucosidase / Pervictosidase / Hexokinase / Phosphoglucose isomerase         YIB automated system         12893         120 mL           SUCROSE		Code	Presentation
YIE automated system       12800       120 mL         LACTOSE/D-GALACTOSE			
J-Galactosidase / J-Calactose dehydrogenase / Mutarotase         YTB automated system       12892       120 mL         MALTOSE/SUCROSE/D-GLUCOSE/D-FRUCTOSE       -         a-Glucosidase / J-Enuctosidase / Hexokinase / Phosphoglucose isomerase       -         YTB automated system       12893       120 mL         SUCROSE       -       -         β-Fructosidase / Hexokinase       -       -         YTB automated system       12893       60 mL         SUCROSE/D-GLUCOSE/D-FRUCTOSE       -       -         β-Fructosidase / Hexokinase       -       -         YTB automated system       12814       60 mL         TOTAL STARCH       -       -         σ-Amytase / Amyfoglucosidase / Hexokinase       -       -         YTB automated system       12848       60 mL       -         Organic acids       Code       Presentation         Acetty-Code synthetase / Linate synthase / L-Malate dehydrogenase       -       -         YTS automated system       12828       90 mL       -         Organic acids       Code       Presentation       -         Acetty-Code Synthetase / L-Malate dehydrogenase       -       -       -         YTS automated system       12828       90 mL<		12800	120 mL
J-Galactosidase / J-Calactose dehydrogenase / Mutarotase         YTB automated system       12892       120 mL         MALTOSE/SUCROSE/D-GLUCOSE/D-FRUCTOSE       -         a-Glucosidase / J-Enuctosidase / Hexokinase / Phosphoglucose isomerase       -         YTB automated system       12893       120 mL         SUCROSE       -       -         β-Fructosidase / Hexokinase       -       -         YTB automated system       12893       60 mL         SUCROSE/D-GLUCOSE/D-FRUCTOSE       -       -         β-Fructosidase / Hexokinase       -       -         YTB automated system       12814       60 mL         TOTAL STARCH       -       -         σ-Amytase / Amyfoglucosidase / Hexokinase       -       -         YTB automated system       12848       60 mL       -         Organic acids       Code       Presentation         Acetty-Code synthetase / Linate synthase / L-Malate dehydrogenase       -       -         YTS automated system       12828       90 mL       -         Organic acids       Code       Presentation       -         Acetty-Code Synthetase / L-Malate dehydrogenase       -       -       -         YTS automated system       12828       90 mL<			
YTE automated system         12882         120 mL           MALTOSE/SUCROSE/D-GLUCOSE/D-FRUCTOSE			
i-Glicosidase / B-routosidase / Hexokinase / Phosphoglucose isomerase YIS automated system 12893 120 mL SUCROSE B-Fructosidase / Hexokinase YIS automated system 12894 60 mL SUCROSE/D-GLUCOSE/D-FRUCTOSE B-Fructosidase / Hexokinase / Phosphoglucose isomerase YIS automated system 12819 60 mL TOTAL STARCH a-Amylase / Amyloglucosidase / Hexokinase YIS automated system 12848 60 mL Organic acids Code Presentation ACETIC ACID (LIQUID) Acetyl-CoA synthetase / Cirate synthase / L-Malate dehydrogenase YIS automated system 12828 90 mL CITRIC ACID SUBJECT CODE CITRIC ACID SUBJECT		12882	120 mL
i-Glicosidase / B-routosidase / Hexokinase / Phosphoglucose isomerase YIS automated system 12893 120 mL SUCROSE B-Fructosidase / Hexokinase YIS automated system 12894 60 mL SUCROSE/D-GLUCOSE/D-FRUCTOSE B-Fructosidase / Hexokinase / Phosphoglucose isomerase YIS automated system 12819 60 mL TOTAL STARCH a-Amylase / Amyloglucosidase / Hexokinase YIS automated system 12848 60 mL Organic acids Code Presentation ACETIC ACID (LQUID) Acetyl-CoA synthetase / Citrate synthase / L-Malate dehydrogenase YIS automated system 12828 90 mL CITRIC ACID MIT / PMS / Ascords te oxidase YIS automated system 12828 90 mL CITRIC ACID Citrate lysse / L-Malate dehydrogenase YIS automated system 12825 50 mL D-LACTIC ACID Gluconate kinase / B-Phosphogluconate dehydrogenase YIS automated system 12801 100 mL GLUCONIC ACID Gluconate kinase / B-Phosphogluconate dehydrogenase YIS automated system 12801 100 mL L-GLUTAMIC ACID Glutamate dehydrogenase / I2830 100 mL L-LACTIC ACID L-LACTIC ACID Glutamate dehydrogenase / I2830 100 mL L-LACTIC ACID L-LACTIC ACID	MALTOSE/SUCBOSE/D-GLUCOSE/D-EBUCTOSE		
SUCROSE <i>β</i> -Fructosidase / Hexokinase         Y15 automated system         12894       60 mL         SUCROSE/D-GLUCOSE/D-FRUCTOSE <i>β</i> -Fructosidase / Hexokinase / Phosphoglucose isomerase         Y15 automated system       12819         60 mL         TOTAL STARCH <i>a</i> -Amylase/Amyloglucosidase / Hexokinase         Y15 automated system       12848         60 mL         Organic acids       Code         Presentation         ACETIC ACID (LIQUID)         Acetyl-CoA synthetase / Cirtate synthase / L-Malate dehydrogenase         Y15 automated system       12930         Y15 automated system       12828         90 mL       Cirtate synthase / L-Malate dehydrogenase         Y15 automated system       12828         90 mL       Cirtate synthase / L-Malate dehydrogenase         Y15 automated system       12828         0 mtL       Cirtate synthase / L-Malate dehydrogenase         Y15 automated system       12825         50 mL       D-Lactate dehydrogenase         Y15 automated system       12801         0 mL       GLUCONIC ACID         Gluconate kinase / eiaphorase       Y16 automated system         Y15 automated system			
g-Fructosidase / Hexokinase         Y15 automated system       12894       60 mL         SUCROSE/D-GLUCOSE/D-FRUCTOSE       g-Fructosidase / Hexokinase / Phosphoglucose isomerase       ////////////////////////////////////	Y15 automated system	12893	120 mL
Y15 automated system         12894         60 mL           SUCROSE/D-GLUCOSE/D-FRUCTOSE <i>β-Fructosidase / Hexokinase / Prosphoglucose isomerase</i> 9           Y15 automated system         12819         60 mL           TOTAL STARCH <i>a-Amylase / Amyloglucosidase / Hexokinase</i> 9         90 mL           Organic acids         Code         Presentation           ACETIC ACID (LIQUID)         Acetyl-CoA synthetase / L-Malate dehydrogenase         90 mL           Y15 automated system         12930         100 mL           ASCORBIC ACID MTT / PMS / Ascorbate oxidase         90 mL         12930           Y16 automated system         12828         90 mL           CITRIC ACID Citrate lyase / L-Malate dehydrogenase         Y16 automated system         12825         50 mL           D-LACTIC ACID D-Lactate dehydrogenase         D-LACTIC ACID         D-Lactate dehydrogenase         12801         100 mL           GLUCONIC ACID Gluconate disystem         12801         100 mL         100 mL           L-GLUTAMIC ACID Gluconate disystem         12830         100 mL         100 mL           L-GLUTAMIC ACID Glucanate dehydrogenase / diaphorase         12830         100 mL         100 mL           L-LACTIC ACID Glucanate dehydrogenase         12830         100 mL         100 mL           L-LActate d	SUCROSE		
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<i>β</i> -Fructosidase / Hexokinase / Phosphoglucose isomerase         Y16 automated system       12819       60 mL         TOTAL STARCH         a-Amylage / Amyloglucosidase / Hexokinase         Y15 automated system       12848       60 mL         Organic acids       Code         Acetyl-CoA synthetese / L-Malate dehydrogenase         X15 automated system       12930       100 mL         ACCOME OF Code         MIT / PMS / Ascorbate oxidase         Y15 automated system       12828       90 mL         CITRIC ACID         MIT / PMS / Ascorbate oxidase         Y15 automated system       12828       90 mL         CITRIC ACID         Citrate lyase / L-Malate dehydrogenase         Y15 automated system       12828       90 mL         Citrate lyase / L-Malate dehydrogenase         Y15 automated system       12825       50 mL         D-LACTIC ACID         Gluconate dehydrogenase         Y15 automated system       12801       100 mL         Gluconate kinase / 6-Phosphogluconate dehydrogenase         Y15 automated s	Y15 automated system	12894	60 mL
Y15 automated system       12819       60 mL         TOTAL STARCH       -Amylase / Amyloglucosidase / Hexokinase         Y15 automated system       12848       60 mL         Organic acids       Code       Presentation         ACETIC ACID (LQUID)       Acetyl-Cod synthetase / Citrate synthase / L-Malate dehydrogenase       Y15 automated system       12930         Y15 automated system       12930       100 mL       ASCORBIC ACID         MTT / PMS / Ascorbate oxidase       Y15 automated system       12828       90 mL         Citrate lyase / L-Malate dehydrogenase       Y15 automated system       12828       90 mL         Citrate lyase / L-Malate dehydrogenase       Y15 automated system       12825       50 mL         D-LACTIC ACID       D       D-LACTIC ACID       D         OLactate dehydrogenase       Y15 automated system       12801       100 mL         GLUCONIC ACID       Gluconate kinase / 6-Phosphogluconate dehydrogenase       Y15 automated system       12811       100 mL         I-GLUTAMIC ACID       Gluconate kinase / diaphorase       Y15 automated system       12830       100 mL         L-LACTIC ACID       Glutamate dehydrogenase / diaphorase       Y15 automated system       12830       100 mL         L-Lactate dehydrogenase / diaphorase       Y15 automated			
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ACETIC ACID (LIQUID)         Acetyl-CoA synthetase / Citrate synthase / L-Malate dehydrogenase         Y15 automated system       12930         MTT / PMS / Ascorbate oxidase         Y15 automated system       12828         90 mL         CITRIC ACID         Citrate lyase / L-Malate dehydrogenase         Y15 automated system       12825         S0 mL         CITRIC ACID         Citrate lyase / L-Malate dehydrogenase         Y15 automated system         D-LACTIC ACID         D-Lactate dehydrogenase         Y15 automated system         12801         100 mL         GLUCONIC ACID         Gluconate kinase / 6-Phosphogluconate dehydrogenase         Y15 automated system         12811       100 mL         L-GLUTAMIC ACID         Glutamate dehydrogenase / diaphorase         Y15 automated system       12830         L-LACTIC ACID         L-LACTIC ACID </td <td>· · ·</td> <td></td> <td>Descentation</td>	· · ·		Descentation
Acetyl-CoA synthetase / Citrate synthase / L-Malate dehydrogenase         Y15 automated system       12930       100 mL         ASCORBIC ACID MTT / PMS / Ascorbate oxidase	Organic acids	Code	Presentation
Y15 automated system       12930       100 mL         ASCORBIC ACID       MTT / PMS / Ascorbate oxidase         Y15 automated system       12828       90 mL         CITRIC ACID       Citrate lyase / L-Malate dehydrogenase       90 mL         Y15 automated system       12825       50 mL         D-LACTIC ACID       D-Lactate dehydrogenase       90 mL         Y15 automated system       12825       50 mL         D-LACTIC ACID       D-Lactate dehydrogenase       90 mL         GLUCONIC ACID       Gluconate kinase / 6-Phosphogluconate dehydrogenase       90 mL         Y15 automated system       12801       100 mL         GLUCANIC ACID       Glutamate dehydrogenase / 12811       100 mL         Glutamate dehydrogenase / diaphorase       12830       100 mL         Y15 automated system       12830       100 mL         L-ACTIC ACID       L-Lactate dehydrogenase       12830       100 mL         L-LACTIC ACID       L-Lactate dehydrogenase       12802       100 mL         L-MALIC ACID       L-Malate dehydrogenase       12802       100 mL			
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Y15 automated system       12828       90 mL         CITRIC ACID       Citrate lyase / L-Malate dehydrogenase       12825       50 mL         Y15 automated system       12825       50 mL       D-LACTIC ACID         D-Lactate dehydrogenase       12801       100 mL         GLUCONIC ACID       Issue / L-Phosphogluconate dehydrogenase       12801       100 mL         GLUCONIC ACID       Issue / L-Phosphogluconate dehydrogenase       12811       100 mL         GLUCATIC ACID       Issue / L-QLUTAMIC ACID       Issue / Iss			
CITRIC ACID         Citrate lyase / L-Malate dehydrogenase         Y15 automated system       12825         D-LACTIC ACID         D-Lactate dehydrogenase         Y15 automated system         12801         100 mL         GLUCONIC ACID         Gluconate kinase / 6-Phosphogluconate dehydrogenase         Y15 automated system         12811         100 mL         L-GLUTAMIC ACID         Glutamate dehydrogenase / diaphorase         Y15 automated system         12830         100 mL         L-GLUTAMIC ACID         Glutamate dehydrogenase         Y15 automated system         12830       100 mL         L-LACTIC ACID         L-Malate dehydrogenase         Y15 automated system         12802       100 mL		12828	90 mL
Citrate lyase / L-Malate dehydrogenase         Y15 automated system       12825         D-LACTIC ACID         D-Lactate dehydrogenase         Y15 automated system         12801         100 mL         GLUCONIC ACID         Gluconate kinase / 6-Phosphogluconate dehydrogenase         Y15 automated system         12811         100 mL         L-GLUTAMIC ACID         Glutamate dehydrogenase / diaphorase         Y15 automated system         12830         100 mL         L-LACTIC ACID         L-MALIC ACID         L-MALIC ACID         L-MALIC ACID         L-Malate dehydrogenase			
Y15 automated system       12825       50 mL         D-LACTIC ACID       D-Lactate dehydrogenase       12801       100 mL         GLUCONIC ACID       Gluconate kinase / 6-Phosphogluconate dehydrogenase       12811       100 mL         Y15 automated system       12811       100 mL       100 mL         L-GLUTAMIC ACID       Glutamate dehydrogenase / diaphorase       12830       100 mL         Y15 automated system       12830       100 mL       100 mL         L-GLUTAMIC ACID       L-LACTIC ACID       12830       100 mL         L-LACTIC ACID       12802       100 mL       100 mL         L-MALIC ACID       12802       100 mL       100 mL			
D-Lactate dehydrogenase         Y15 automated system       12801       100 mL         GLUCONIC ACID       Gluconate kinase / 6-Phosphogluconate dehydrogenase       12811       100 mL         Y15 automated system       12811       100 mL       12811       100 mL         L-GLUTAMIC ACID       Glutamate dehydrogenase / diaphorase       12830       100 mL         Y15 automated system       12830       100 mL       12830       100 mL         L-LACTIC ACID       L-Lactate dehydrogenase       12802       100 mL         L-MALIC ACID       12802       100 mL       12802       100 mL		12825	50 mL
D-Lactate dehydrogenase         Y15 automated system       12801       100 mL         GLUCONIC ACID       Gluconate kinase / 6-Phosphogluconate dehydrogenase       12811       100 mL         Y15 automated system       12811       100 mL       12811       100 mL         L-GLUTAMIC ACID       Glutamate dehydrogenase / diaphorase       12830       100 mL         Y15 automated system       12830       100 mL       12830       100 mL         L-LACTIC ACID       L-Lactate dehydrogenase       12802       100 mL         L-MALIC ACID       12802       100 mL       12802       100 mL			
GLUCONIC ACID         Gluconate kinase / 6-Phosphogluconate dehydrogenase         Y15 automated system         12811         100 mL         L-GLUTAMIC ACID         Glutamate dehydrogenase / diaphorase         Y15 automated system         12830         100 mL         L-LACTIC ACID         L-Lactate dehydrogenase         Y15 automated system         12802         100 mL			
Gluconate kinase / 6-Phosphogluconate dehydrogenase         Y15 automated system       12811       100 mL         L-GLUTAMIC ACID       Glutamate dehydrogenase / diaphorase       Y15 automated system       12830       100 mL         Y15 automated system       12830       100 mL       Image: Color Colo	Y15 automated system	12801	100 mL
Gluconate kinase / 6-Phosphogluconate dehydrogenase         Y15 automated system       12811       100 mL         L-GLUTAMIC ACID       Glutamate dehydrogenase / diaphorase       Y15 automated system       12830       100 mL         Y15 automated system       12830       100 mL       Image: Color Colo	GLUCONIC ACID		
L-GLUTAMIC ACID Glutamate dehydrogenase / diaphorase Y15 automated system 12830 100 mL L-LACTIC ACID L-Lactate dehydrogenase Y15 automated system 12802 100 mL L-MALIC ACID L-Malate dehydrogenase	Gluconate kinase / 6-Phosphogluconate dehydrogenase		
Glutamate dehydrogenase / diaphorase         Y15 automated system       12830       100 mL         L-LACTIC ACID       L-Lactate dehydrogenase       12802       100 mL         Y15 automated system       12802       100 mL         L-MALIC ACID       L-MALIC ACID       L-Malate dehydrogenase	Y15 automated system	12811	100 mL
Y15 automated system     12830     100 mL       L-LACTIC ACID       L-Lactate dehydrogenase       Y15 automated system     12802     100 mL       L-MALIC ACID       L-Malate dehydrogenase			
L-LACTIC ACID L-Lactate dehydrogenase Y15 automated system 12802 100 mL L-MALIC ACID L-Malate dehydrogenase		12020	100 ml
L-Lactate dehydrogenase         Y15 automated system         12802         L-MALIC ACID         L-Malate dehydrogenase		12030	
Y15 automated system     12802     100 mL       L-MALIC ACID       L-Malate dehydrogenase			
L-MALIC ACID L-Malate dehydrogenase		12802	100 ml
L-Malate dehydrogenase		.2002	
Y15 automated system 12803 100 mL		12803	100 mL

#### PYRUVIC ACID

D-Lactate dehydrogenase		
Y15 automated system	12826	50 mL
TARTARIC ACID		
Vanadium salt		
Y15 automated system	12808	100 mL
Alcohols	Code	Presentation
ETHANOL		
Alcohol dehydrogenase		
Y15 automated system	12847	120 mL
GLYCEROL		
Glycerol phosphate oxidase / Peroxidase		
Y15 automated system	12812	120 mL
lons	Code	Presentation
CALCIUM		
Arsenazo III		
Y15 automated system	12824	80 mL
COPPER		
PAESA		
Y15 automated system	12814	100 mL
IRON		
Ferrozine		
Y15 automated system	12817	100 mL
PHOSPHATE		
Phosphomolybdate / UV		
Y15 automated system	12877	80 mL
POTASSIUM		
Pyruvate kinase K+ -Dependant		
Y15 automated system	12823	80 mL
Nitrogenated substances	Código	Presentation
AMMONIUM		
Glutamate dehydrogenase		
Y15 automated system	12809	100 mL
NITRITE		
Sulfanilamide / naphtylethylendiamine		
Y15 automated system	12842	50 mL
PRIMARY AMINO NITROGEN (PAN)		
O-Phthaldialdehyde (OPA)		
Y15 automated system	12807	100 mL
PROTEIN (TOTAL)		
Biuret		
Y15 automated system	12500	100 mL
UREA		
Glutamate dehydrogenase / Urease		
Y15 automated system	12879	200 mL

Other parameters	Code	Presentation
ACETALDEHYDE		
Aldehyde dehydrogenase		
Y15 automated system	12820	50 mL
HISTAMINE		
Histamine dehydrogenase		
Y15 automated system	12829	100 mL
LACTATE DEHYDROGENASE		
Pyruvate		
Y15 automated system	12580	5 x 40 mL + 5 x 10 mL
POLYPHENOLS		
Folin-Ciocalteau		
Y15 automated system	12815	80 mL

# Controls & calibrators

Test & code	Presentation	Included analytes
MULTICAL 12818	5 x 10 mL	Acetic Acid, Ammonia, Citric Acid, D-Gluconic Acid, D-Glucose, D-Glucose/D-Fructose, Glycerol, D-Lactic Acid, L-Lactic Acid, L-Malic Acid, PAN and Sucrose/D-Glucose/D-Fructose.
MULTICAL IONS 12841	5 x 10 mL	Calcium, Copper, Iron and Potassium.
MULTIREFERENCE 12933	2 x 10 mL	Acetic Acid, Ammonia, Citric Acid, D-Gluconic Acid, D-Glucose, D-Glucose/D-Fructose, Glycerol, D-Lactic Acid, L-Lactic Acid, L-Malic Acid, PAN and Sucrose/D-Glucose/D-Fructose.



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