BA-400

AUTOMATED CLINICAL CHEMISTRY ANALYZER

PRIMECARE DIAGNOSTICS
& Medical Equipment Co.Ltd

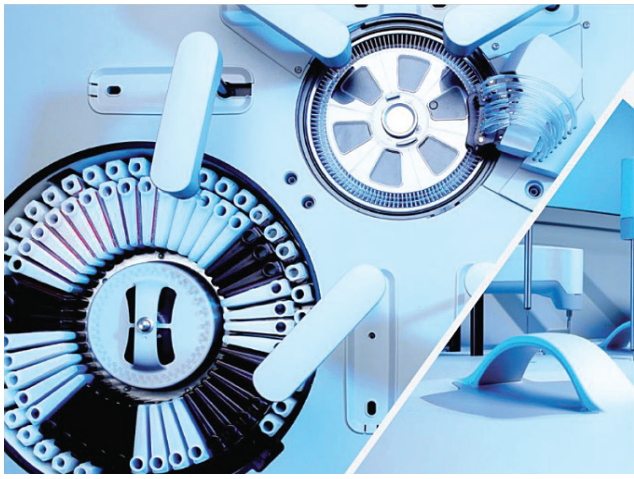
AUTOMATED CHEMISTRY ANALYZER

Smart Efficiency

BioSystems designs and develops efficient systems that implement the latest and best technical solutions.
BioSystems' BA400 is a clinical chemistry and turbidimetry analyzer designed to offer the best performance to laboratories looking towards achieving highest efficiency with optimal operative cost.
In combination with BioSystems original reagents and worldwide technical support coverage, the BA400 system defines the new generation of clinical analyzers.

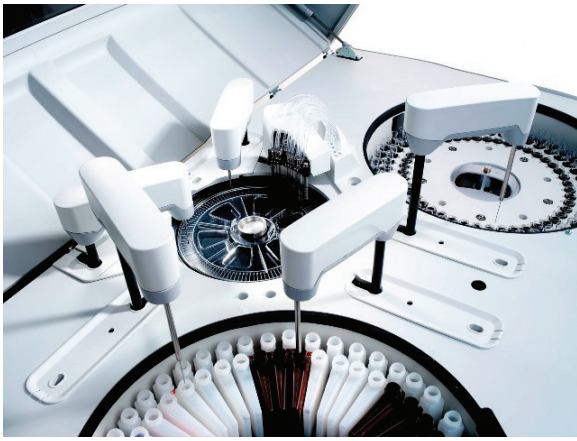
Smart Autonomy

88 refrigerated positions with internal barcode reader.
135 positions for samples, controls and standards suitable for primary or paediatric tubes, 90 of them with barcode reading.
High capacity washing solution and waste containers, able to operate up to 8 hours of continuous working without refilling/voiding.
Automated water inlet and waste outlet with internal reservoirs, easy to adapt to any lab facilities.



Smart Optics

Biosystems has developed for its BA400 analyzer an advanced and innovative optical system based on a battery of high power LED monochromatic sources with 8 working wavelengths that covers the most demanding methods of routine and special chemistry.
Solid-state light source with a split reference beam, with a working life up to 50.000 hours, to achieve optimal accuracy and performance.



Smart Performance

Self-controlled electronic subsystems through CAN bus optimize performance and reduce maintenance down-times.
Sample dispensing system of high accuracy with level, collision and clot detection that automatically retreats to a protected home position during stops.
Low water consumption (less than 14 l/hour) with thermostated fluid washing station system to keep rotor temperature stable.
Low mechanical wear dispensing pumps with ceramic piston.
Independent powered cooling system for reagents (temperature between 5 and 8 oC, up to 35 oC room temperature).

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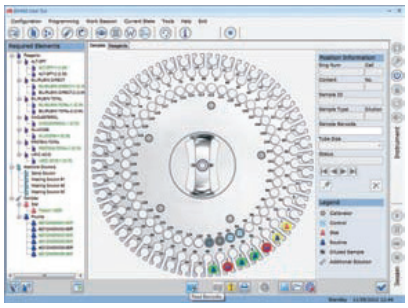
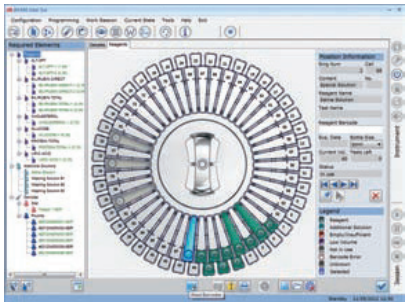
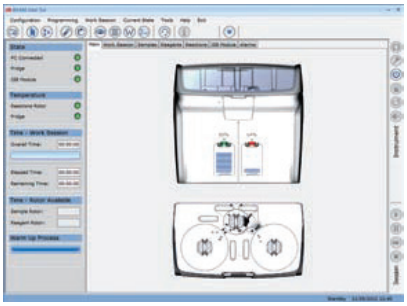
Smart Solutions

High operating autonomy, through its high capacity for samples and reagents.
Optical system with Biosystems' patented LED technology, with virtually no maintenance.
Low operating cost with optimized water and power consumption, minimum reaction volume and high pipetting precision.
Distributed electronics through CAN (Controller Area Network) bus system to increase robustness, simplify maintenance and reduce down times.
User friendly software, with intuitive graphical interface, real time monitoring of work-session and exhaustive quality control analysis (Westgard rules, Youden and Levy-Jennings charts, historical results database management).







Smart System

Original reagents specially designed and optimized for its use in the BA400 system, covering a complete panel of clinical chemistry and specific protein tests.
Worldwide technical assistance coverage with Biosystems' certified engineers.
BioSystems SA, as a European manufacturer of its own reagents and analyzers, ensures proper functionality of all components under strict quality and safety standards for maximum performance and capabilities of their systems.

Technical Specifications

Throughput	**400 test/h (without electrolytes)**
Throughput ISE module	**320 test/h**
Principles of analysis	**Colorimetry, turbidimetry.**

ISE Module (optional)

Method type	ISE direct
Sample type	Serum, Plasma or Urine
Electrode type	Na+, K+, Cl-. Li+ (optional)
Sample volume	Serum: 100 µL / Urine: 200 µL

Sample handling

Capacity of sample rotor	135
Barcode detector	Yes
Number of samples with barcode	90
Sample tube size	Diameter from 12 mm to 16 mm (height up to 100 mm)
Pediatric well	13.5 mm diameter
Type of syringe	Ceramic piston pump with low maintenance
Sample type:	Serum, Plasma, Whole Blood, Urine Cerebrospinal, Semen, Biological Liquid
Pipetting volume	from 2 µL to 40 µL
Pipetting resolution	0.1 µL
Predilution ratio	From 1:2 to 1:200
Level detection	Yes
Clot detector	Yes
Vertical collision detector	Yes

Reagent handling

Volume of reagent bottles	20 mL, 60 mL
Capacity of reagent rotor	88 (44 bottles of 20 mL or 60 mL + 44 bottles of 20 mL)
Cooled reagent	Yes
Temperature range of refrigerator	From 5 °C to 8 °C (at room temperature of 25 °C)
Barcode detector	Yes
Reagent volume R1	From 90 µL to 450 µL
Reagent volume R2	From 10 µL to 300 µL
Type of syringe	Ceramic piston pump with low-maintenance
Pipetting resolution	1 µL
Level detection	Yes
Vertical collision detector	Yes
Thermostated tip	Yes

Reactions rotor

Minimum reaction volume 1	80 µL
Maximum reaction volume	600 µL
Number of wells	120
Well material	UV methacrylate
Temperature reaction rotor	37 °C
Accuracy of temperature	± 0.2 °C
Temperature stability	± 0.1 °C
Mixers	2
Cuvette washing system	7 tips (2 wash, 3 rinse, 2 dry)

Optical System

Light source	LED + Hard Coating filter
Wavelengths	340 - 405 - 505 - 535 - 560 - 600 - 635 - 670 nm
Filters bandwidth	10 nm ± 2 nm
Photometric range	-0.2 A to 3.5 A
Internal resolution	0.0001 A
Detector	Main Photodiode + reference photodiode
Measurement precision (for 340 nm, 405 nm and 505 nm)	CV < 1% to 0.1 A CV < 0.1% to 2 A

Environmental Requirement

Ambient temperature	From 10 °C to 35 °C From 10 °C to 30 °C (With ISE module)
Relative humidity	< 85% without condensation
Altitude	< 2 500 m

Dimensions and weight

Dimensions (width, depth and height)	1 200 mm x 720 mm x 1 258 mm
Weight	210 Kg

Electrical Requirements

Main voltages	115 V to 230 V
Main frequencys	50 Hz or 60 Hz
Electric power	500 VA

Fluidic Requirements

Water inlet	External tank or mains water supply
Water type	Purified Type II
Water consumption	< 14 L/h
Bottle of high concentration waste	5 L
Bottle of washing solution	5 L

Minimum Computer Requirements

Operating system	Windows® 7, 8.1 or 10
CPU	Equivalent to Intel Core i3 @3.10 GHz or higger
RAM	4 Gbytes
Hard Disk	40 GB or higher
DVD Yes	
Monitor minimum resolution	Minimum resolution 1 024 x 768
Connector of serial channel	USB
Connectivity to LIS (Laboratory Information Systems)	HL7 and ASTM protocols

Directives and Standards Compliance

EC Directive	98/79/EC IVD

Biochemistry

Code	Test	Presentation	
		R1	R2
21550	α-Amylase-Direct	8x20 mL	
21534	α-Amylase-EPS	2x60 mL	2x15 mL
21799	α-Amylase Pancreatic	2x60 mL	2x15 mL
2153	Alanine Aminotransferase (ALT/GPT)	8x60 mL	8x15 mL
21547	Albumin	10x60 mL	
21592	Alkaline Phosphatase (ALP)-AMP	4x60 mL	4x15 mL
21590	Alkaline Phosphatase (ALP)-DEA	4x60 mL	4x15 mL
21531	Aspartate Aminotransferase (AST/GOT)	8x60 mL	8x15 mL
21798	Bilirubin (Direct)	4x60 mL	3x20 mL
21510	Bilirubin (Total)	8x60 mL	8x15 mL
21570	Calcium-Arsenazo	10x60 mL	
21558	Carbon Dixide	2x60 mL	
21505	Cholesterol	10x60 mL	
21557	Cholesterol HDL Direct	2x60 mL	2x20 mL
21585	Cholesterol LDL Direct	2x60 mL	2x20 mL
21588	Cholinesterase (CHE)	2x60 mL	2x15 mL
21790	Creatine Kinase (CK)	2x60 mL	2x15 mL
21792	Creatine Kinase-MB (CK-MB)	2x60 m	2x15 mL
21502	Creatinine	5x60 mL	5x60 mL
21520	γ-Glutamyltransferase (γ-GT)	4x60 mL	4x15 mL
21503	Glucose	10x60 mL	
21509	Iron-Ferrozine	4x60 mL	4x15 mL
21580	Lactate Dehydrogenase (LDH)	8x60 mL	8x15 mL
21586	Lactate Dehydrogenase (LDH)-IFCC	8x60 mL	8x15 mL
21793	Lipase	2x50 mL	1x20 mL
21797	Magnesium	2x60 mL	2x15 mL
21508	Phosphorus	4x60 mL	2x50 mL
21500	Protein (Total)	10x60 mL	
21501	Protein (Urine+CSF)	4x60 mL	
21528	Triglycerides	10x60 mL	
21516	Urea/BUN-UV	8x60 mL	8x15 mL
21521	Uric Acid	10x60 mL	

Turbidimetry

Code	Test	Presentation	
		R1	R2
22324	Albumin (Microalbuminuria)	4x60 mL	4x15 mL
22923	Anti-Streptolysin O (ASO)	2x60 mL	2x15 mL
22936	Antithrombin III	2x60 mL	2x15 mL
22928	α-1-Acid Glycoprotein	2x60 mL	
22491	α-1-Microglobulin	2x60 mL	2x15 mL
22095	Apolipoprotein A-I (APO A-I)	2x60 mL	2x15 mL
22098	Apolipoprotein B (APO B)	2x60 mL	2x15 mL
22925	b2-Microglobulin	2x60 mL	2x15 mL
22084	Complement Component C3	2x60 mL	
22085	Complement Component C4	2x60 mL	
22921	C-Reactive Protein (CRP)	4x60 mL	4x15 mL
22927	C-Reactive Protein-hs (CRP-hs)	2x60 mL	2x15 mL
22044	Hemoglobin A1C-turbi	75 mL	
22934	Ferritin	2x50 mL	1x50 mL
22082	Immunoglobulin A (Ig A)	2x60 mL	
22081	Immunoglobulin G (Ig G)	2x60 mL	
22083	Immunoglobulin M (Ig M)	2x60 mL	
22929	Prealbumin	2x60 mL	
22922	Rheumatoid Factors (RF)	4x60 mL	4x15 mL
22091	Transferrin	2x60 mL	

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