



**cobas<sup>®</sup> 4000 analyzer series**  
*Freedom to realize your lab's potential*



**cobas<sup>®</sup>**  
*Life needs answers*

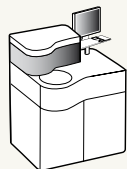
*The comprehensive serum work area solution  
for workloads of up to 200 samples per day*

## **cobas<sup>®</sup> 4000 analyzer series**

### **cobas c 311 analyzer**

Passion for predictability in chemistry

- Unmatched reagent efficiencies
- Broadest menu of chemistry reagents available
- Proven reliability of Roche/Hitachi instrumentation



### **cobas e 411 analyzer**

Peace of mind in immunology

- Unmatched reagent efficiencies
- Fastest STAT assays on the market
- Superior performance of ECL technology



### **cobas<sup>®</sup> e-services**

Lab intelligence at your fingertips

- Immediate troubleshooting via remote access
- Automatically updated assay library
- Advanced performance monitoring



### **Work area management solutions**

Standardize & integrate your data management

- Reduced variability
- Increased efficiency
- Enhanced Information



# cobas c 311 analyzer

*Passion for predictability in chemistry*



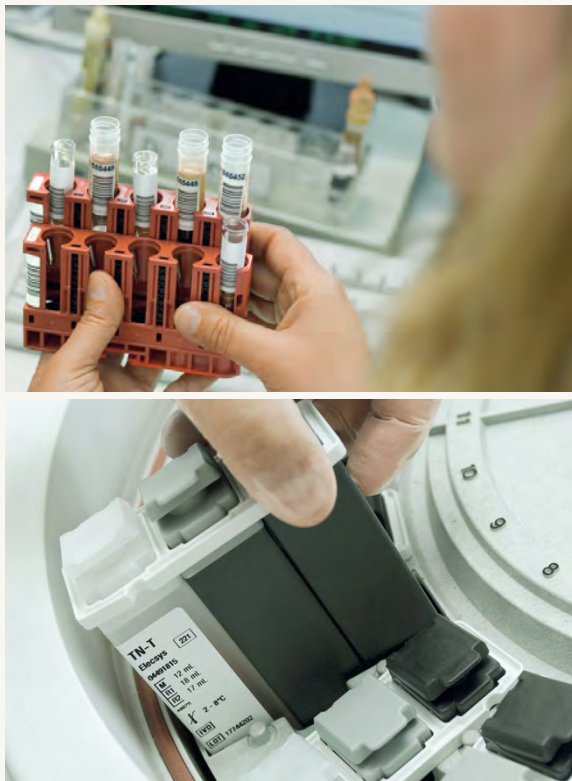
The **cobas c 311** analyzer offers the ultimate in convenience, performance and confidence for laboratories with clinical chemistry workloads of 50-200 samples per day.

- The **cobas c** reagent packs deliver maximum handling convenience with minimum reagent waste, liquid ready-to-use reagents and 90 day average onboard reagent stability
- With industry-leading parameters such as Tina-quant® HbA1c with automated pretreatment of whole blood samples, the **cobas c 311** analyzer offers the broadest assay menu on the market
- Roche/Hitachi in design and manufacture, the **cobas c 311** analyzer continues the long tradition of proven reliability



# cobas e 411 analyzer

*Peace of mind in immunology*



Successor to the Elecsys® 2010, one of the most successful immunoanalyzers ever developed, the **cobas e 411** analyzer is a perfect complement to the **cobas c 311** analyzer.

- The **cobas e** reagent packs offer best-in-class handling convenience and reagent efficiencies for immunochemistry testing with liquid ready-to-use reagents and 60 day average onboard reagent stability
- 9 minute STAT applications for troponin, CK-MB, myoglobin, hCG and PTH provide unmatched response times
- As the heart of the **cobas e 411** analyzer, ECL technology delivers the unique combination of high analytical sensitivity, wide measuring ranges and 9 minute STAT applications for unparalleled performance in immunochemistry

# Work area management    **cobas<sup>®</sup>** e-services

*Standardize & integrate  
your data management*      *Lab intelligence at  
your fingertips*

One work area management tool extending capabilities of most laboratory information systems:

- Reducing variability through consistency in decision management
- Increasing efficiency by comprehensive workflow tools
- Active management of results and patient data providing optimal information management for physicians

- **cobas** e-support – immediate trouble shooting via remote access improving system uptime and operative efficiency
- **cobas** e-library – automatic update functionality safeguarding online access to most recent application information on reagents, calibrators and controls
- **cobas** e-LabPerformance\* – offering advanced performance monitoring tools for efficient QC management
- **cobas** link - enabling **cobas** e-services via secure gateway connection between laboratory and Roche

*\* in preparation*



# Laboratory Network Solutions

*With the cobas<sup>®</sup> modular platform*



*cobas 8000 modular analyzer series*



*cobas 6000 analyzer series*



*cobas 4000 analyzer series*

With the **cobas** modular platform, Roche has developed a platform concept that delivers customized solutions based on a common architecture for various workloads and testing requirements. Whether you run a large central laboratory or manage a network of satellite laboratories, Roche can offer you a tailored solution.

Above you will find our current and future analyzer series for your laboratory:



## **cobas<sup>®</sup> modular platform – Benefits**

### **Common applications**

for standardized patient results

### **Universal reagent carriers**

for simplified logistics

### **Flexible configurations**

for tailor-made solutions

### **cobas user interface**

for easy training & flexible staff

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# cobas<sup>®</sup> 4000 analyzer series

## *cobas c 311 assay menu*

### Substrates

Albumin (BCP+BCG)  
 Ammonia  
 Bicarbonate  
 Bilirubin-direct  
 Bilirubin-total  
 Calcium  
 Cholesterol  
 HDL Cholesterol  
 LDL Cholesterol  
 Creatinine enz.  
 Creatinine Jaffé  
 Fructosamine  
 Glucose  
 Iron  
 Lactate  
 Magnesium  
 Phosphorus  
 Total Protein  
 Total Protein U / CSF  
 Triglycerides  
 Triglycerides GB  
 UIBC  
 Urea / BUN  
 Uric Acid

### Enzymes

ACP  
 ALP  
 ALT / GPT  
 Amylase-tot.  
 Amylase-pancr.  
 AST / GOT  
 Cholinesterase Acetyl  
 Cholinesterase Butyryl  
 Cholinesterase Dibucain  
 CK  
 CK-MB  
 GGT  
 GLDH  
 HBDH  
 LDH  
 Lipase

### Electrolytes (ISE)

Chloride  
 Potassium  
 Sodium

### Proteins

α1-Acid Glycoprotein  
 α1-Antitrypsin  
 α1-Microglobulin  
 β2-Microglobulin  
 Albumin (immuno.)  
 APO A1  
 APO B  
 ASLO  
 C3c  
 C4  
 Ceruloplasmin  
 CRP  
 CRP High Sensitivity  
 Cystatin C  
 Ferritin  
 Haptoglobin  
 HbA1c (whole blood + hemolysate)  
 Homocysteine<sup>2</sup>  
 IgA  
 IgG  
 IgM  
 Kappa Light chains  
 Freelite™ Human Lambda Free<sup>2</sup>  
 Lambda Light chains  
 Freelite™ Human Lambda Free<sup>2</sup>  
 Lipoprotein (a)  
 Myoglobin  
 Prealbumin  
 RF  
 Soluble Transferrin Receptor  
 Transferrin



Life needs answers

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**Drugs of abuse (DAT)**

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Amphetamines

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Barbiturates

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Benzodiazepines

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Cannabinoids

---

Cocaine

---

LSD<sup>1</sup>

---

Ethanol

---

Methadone

---

Methadone Methabolite (EDDP)

---

Methaqualone

---

Opiates

---

Oxycodone<sup>1</sup>

---

Phencyclidine

---

Propoxyphene

---

---

**Therapeutic drug monitoring (TDM)**

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Acetaminophen

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Amikacin

---

Carbamazepine

---

Digitoxin

---

Digoxin

---

Gentamicin

---

Lidocaine<sup>1</sup>

---

Lithium

---

MPA-T

---

NAPA

---

Phenobarbital

---

Phenytoin

---

Procainamide

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Quinidine<sup>1</sup>

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Salicylate

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Theophylline

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Tobramycin

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Valproic Acid

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Vancomycin

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**Others**

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D-Dimer

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Anti-Thrombin III

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<sup>1</sup> Assays currently under development

<sup>2</sup> Partner Channel

Last Update 02/2010



## **cobas c 311 analyzer**

*Passion for predictability in chemistry*

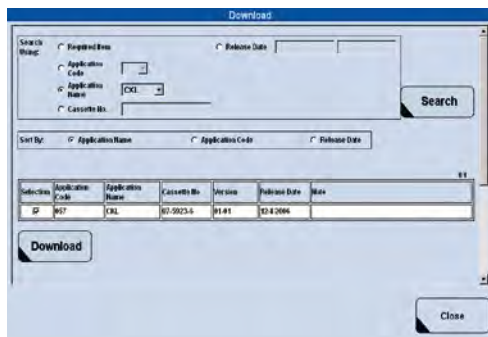


**cobas<sup>®</sup>**

*Life needs answers*

# cobas c 311 analyzer

## *Passion for predictability in chemistry*



Electronic updates & downloads via cobas® e-services

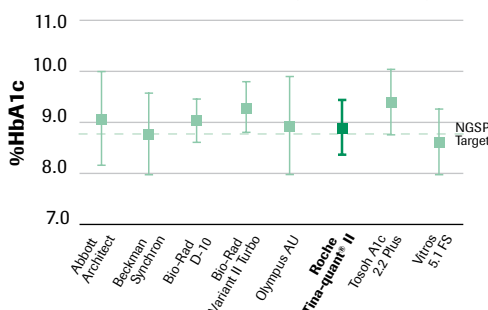
### Convenience

**cobas c** packs for convenient handling

- Liquid, ready-to-use **cobas c** reagent packs simplify handling
- All-in-one cassette for each parameter streamlines logistics
- Electronic updates and downloads ensure seamless, error-free data handling
- Assay-specific pack sizes enable economic usage of routine and esoteric parameters



### CAP GH2-A 2008 mid level (mean ± 2SD)



College of American Pathologists (CAP) HbA1c Survey Data; Source: <http://www.ngsp.org/prog/index.html>; May 2008

### Performance

Full menu of high performance assays

- Whole blood HbA1c offers best-in-class performance
- High onboard stability allows continuous availability of over 40 assays
- Over 100 assays offer a comprehensive clinical chemistry menu
- High calibration stability and lot-to-lot calibration optimize reagent use



### Confidence

Robust design and sample integrity checks

- **cobas c 311** analyzer continues the Roche/Hitachi tradition of reliable instrumentation
- Intelligent clot detection ensures reliable results without workflow disruptions
- Contact-free ultrasonic mixing eliminates carry-over
- Test-specific serum indices ensure result integrity without manual validation



1 108 sample positions with continuous random access & flexible STAT priority settings

2 66 semi-disposable reaction cuvettes with ultrasonic mixing for reduced water consumption

3 Sample probe equipped with clot detection and vacuum drying

4 Robust ISE unit using indirect method

5 Multi-functional reagent probe utilizes tool to puncture sealed reagent cassettes

6 42 cooled positions for cobas c reagent packs enable full menu consolidation

7 **cobas**<sup>®</sup> user interface standardized to other **cobas** systems

### Full workstation consolidation

- The **cobas c 311** analyzer is designed to be a true work-horse on account of proven technology
- It consolidates clinical chemistry with special proteins, DATs and TDMs

### Serum work area integration

- Combined with the **cobas e 411** immunoanalyzer, the system can process up to 95% of your serum work area workload
- Work area management solutions integrate sample and data management across systems

### Seamless laboratory networking

- As part of the **cobas** modular platform, the **cobas c 311** analyzer offers consistent results with other **cobas c** systems
- Universal reagent carriers and analytical components enable flexible network solutions

# cobas c 311 analyzer

## *Technical specifications*

System	Fully automated, random access analyzer for Clinical Chemistry, Electrolytes & Homogeneous Immunoassays (HIA)
Test Throughput	Up to 300 tests/hr (photometry), 450 tests/hr (ISE only) and 300 tests/hr (mixed)
Reagent concept	Barcoded <b>cobas c</b> reagent packs with convenient packaging & ready-to-use reagents
Onboard reagent capacity	Up to 45 assays (42 cooled cassette slots + 3 channels for ISE)
Programmable parameters	Up to 117 photometric, 3 ISE tests, 8 calculated parameters & 3 serum indices
Sample types	Serum, Plasma, Urine, CSF & Whole Blood
Onboard sample capacity	108 positions with continuous access & STAT interrupt capability
Sample container types	Primary tubes: 5 – 10 mL (16x100, 16x75, 13x100, 13x75 mm) Sample cup: 2.5 mL Micro cup: 1.5 mL Cup on tube
Sample volume	1.0 to 35 µL in 0.1 µL steps
Sample clot detection	Yes
Minimum sample volume	Primary tubes: 700 µL Sample cup: 100 µL Micro cup: 50 µL
Sample barcode types	Code 128, Codabar (NW 7), Interleaved 2 of 5, Code 39
System interfaces	Touchscreen PC, RS 232 serial interface, bi-directional, <b>cobas</b> <sup>®</sup> link (TeleService and auto download)
Sample database	10,000 routine/STAT samples
Test methods	1 point, 1 point + prozone check, 2 point, 2 point kinetic, 2 point + prozone check, 3 point, 1 point + kinetics, Rate A, Rate A + serum index, Rate A with blank, Rate B
Calibration methods	Linear, non-linear multi-points, 2 point calibration, K-factor, up to 100 calibrators pre-programmable, storage of up to 180 curves; Preventive calibration of stand-by cassettes.
QC methods	Real-time, individual & cumulative QC; Auto QC; Up to 100 different controls pre-programmable; Preventive QC after calibration of stand-by cassettes
Rerun/repeat/reflex	Automatic rerun/manual reruns, repeats & automatic reflex supported
Electrical requirements	Power requirements: 230/400 Volts AC 3/N/PE, 110 Volts AC 1.5 kVA Frequency: 50 Hz or 60 Hz +/- 0.5 %
Water/waste requirements	Water quality: Bacteria free, de-ionised water supply resistance of 1.0 µS/cm max. Water consumption: Up to 12 l/hr during operation Water pressure: 0.5 – 3.5 kg/cm <sup>3</sup> (49 – 343 KPa) Water temperature: 15 to 30°C Biohazards waste: Separate container located in the system Wall drain for waste: 100 mm above the floor
Regulatory compliance	GS, CE, UL, C-UL compliant
Operating conditions	Ambient temperature/humidity: 15 to 32°C/30 to 85% (RH, without condensation) Heat & noise output: 2 kcal/h; < 65 dB
Physical dimensions	Width: 134 cm Depth: 86 cm Height: 126 cm Weight: 270 kg

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# cobas<sup>®</sup> 4000 analyzer series

## *cobas e 411 assay menu*

### Thyroid function

Anti-TG

Anti-TPO

Anti-TSHR

Calcitonin<sup>1</sup>

FT3

FT4

T3

T4

T-Uptake

Tg

Tg hs<sup>1</sup>

TSH

### Fertility / hormones

ACTH

C peptide

Cortisol

DHEA-S

Estradiol

FSH

hCG+β

hCG STAT

Insulin

LH

Progesterone

Prolactin

SHBG

Testosterone

### Tumor markers

AFP

CA 125 II

CA 15-3

CA 19-9

CA 72-4

CEA

CYFRA 21-1

free PSA

NSE

total PSA

### Cardiac

CK-MB (mass)

CK-MB (mass) STAT

Digoxin

Digitoxin

Myoglobin

Myoglobin STAT

NT-proBNP

Troponin T

Troponin T hs

Troponin T hs STAT

Troponin T STAT

### Infectious diseases

Anti-HAV total

Anti-HAV IgM

Anti-HBc

Anti-HBc IgM

Anti-HBe

Anti-HBs

Anti-HCV

HBeAg

HBsAg

HBsAg confirmatory

HBsAg quantification

CMV IgG

CMV IgM

CMV IgG Avidity<sup>1</sup>

HSV-1<sup>1</sup>

HSV-2<sup>1</sup>

HIV Antigen

HIV Antigen confirmatory

HIV combi

HIV combi PT<sup>1</sup>

Rubella IgG

Rubella IgM

Toxo IgG

Toxo IgM



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**Maternal care**

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free  $\beta$  hCG

PAPP-A

PIGF

sFLT-1

---

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**Rheumatoid Arthritis**

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Anti-CCP

---

---

**Anemia**

---

Ferritin

Folate

RBC Folate

Vitamin B12

---

---

**Critical care**

---

IL6

BRAHMS PCT

S100

---

---

**Bone markers**

---

$\beta$ -CrossLaps

Vitamin D3 (25-OH)

Intact PTH

N-MID Osteocalcin

P1NP

PTH STAT

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**Others**

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IgE

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<sup>1</sup> Assays currently under development  
Last Update 02/2010

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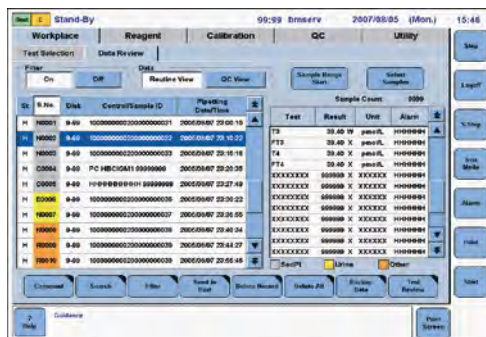
**cobas e 411 analyzer**  
*Peace of mind in immunology*



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# cobas e 411 analyzer

## Peace of mind in immunology



Enhanced data review screen

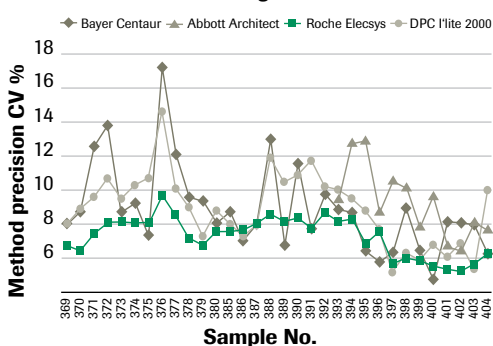
### Convenience

**cobas e** packs for convenient handling

- **cobas e** reagent packs are liquid, ready-to-use and simplify handling
- All-in-one cassette packaging for each parameter combined with calibrators streamlines logistics
- Automatic pack opening/closing ensures longer onboard stability
- Programming-by-loading concept ensures seamless, precise data handling
- Data review screen provides quick result traceability



### PTH Precision Monitoring



Elecsys assay performance in external ring-trials

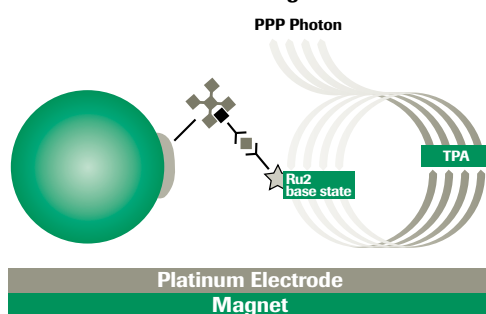
### Performance

9 min applications for speed and quality

- Over 75 assays offer comprehensive coverage of 7 indication areas
- High onboard stability and shelf-life allow continuous availability of both routine and esoteric parameters
- Disposable tips and assay cups for reaction eliminate risk of carryover
- Integrated safety features ensure result integrity



### Reaction Phase - Measuring Cell



Electrochemiluminescence (ECL) reaction principle

### Confidence

ECL technology: The gold standard

- High analytical sensitivity enables large measuring ranges and low sample volume  
 Measuring ranges: Estradiol 4-4,300 pg/mL;  
 Progesterone 0-6 ng/mL;  
 Total PSA 0-100 ng/mL;  
 Sample Volume:  $\beta$ -hCG requires 10  $\mu$ L; 3rd Gen TSH requires 50  $\mu$ L
- Activation with voltage for a controlled reaction allows high precision to avoid unnecessary repeats and reruns
- Short incubation time enables the timely availability of innovative applications



1 CD-ROM, USB & printer ports enable efficient data management

2 Also available rack version with 75 sample positions

3 30 continuous random access sample positions with STAT priority

4 **cobas**® touchscreen user interface is standardized to other cobas systems

5 18 channels enable use of up to 18 parameters simultaneously

6 Easy removal of disposables via solid waste container

7 Disposable tips and cups eliminate carryover

8 Measuring cell provides unmatched detection using ECL technology

9 Consumables and liquid waste are easily accessible

#### Full workstation consolidation

- The **cobas e 411** analyzer is designed to deliver accurate results on account of proven ECL technology
- It consolidates routine endocrinology with cardiac, cancer, bone and infectious disease markers

#### Serum work area integration

- Combined with the **cobas c 311** analyzer, the system processes up to 95% of your serum work area workload
- Work area management solutions integrate sample and data management across systems

#### Seamless laboratory networking

- As part of the cobas modular platform, the **cobas e 411** analyzer offers consistent results with other **cobas e** systems
- Universal reagent carriers and analytical components enable flexible network solutions

# cobas e 411 analyzer

## *Technical specifications*

System	Fully automated, continuous loading and random access system for immunoassay analysis based on ECL technology. Available as a disk and rack system. System components: Analytical module including touchscreen PC
Test Throughput	Up to 86 tests/hr
Reagent concept	cobas e reagent pack: Ready-to-use reagents Onboard reagent capacity: 18 channels/reagent slots for up to 18 different assays Evaporation protection: Automatic closure of reagent lids
Programmable parameters	Max 60 assays definable via 2D-barcode including all necessary information (programming by loading)
Sample types	Serum, Plasma, Urine and others
Onboard sample capacity	Load/unload capacity: Disk: 30 samples Rack: 75 samples on 15 RD standard 5 position rack Rack types: Routine, STAT, Control, Calibrator STAT handling: Disk: Any unoccupied position on the sample disk Rack: Dedicated STAT port on rack feeder
Sample container types	Primary tubes: 5–10 mL; 16x100, 16x75, 13x100, 13x75 mm Sample cup: 2.5 mL Cups on tube
Sample volume	10 to 50 µL per test, depending on assay protocol
Sample probe	Disposable tips for individual sample to avoid carry over; Sample clot detection; Liquid level detection
Sample barcode types	PDF417, Code 128, Codabar (NW 7), Interleaved 2 of 5, Code 39
System interfaces	Touchscreen PC, RS 232 serial interface, bi-directional Standard PC ports (USB, ethernet, serial etc) for other communication devices
Sample database	2,000 results for routine, STAT and controls
Test methods	Pre-defined assay protocols (sandwich, competitive, titration)
Calibration methods	2-point calibration per lot or per cobas e reagent pack
QC methods	Individual QC; Cumulative QC; Preventive QC after calibration
Rerun/repeat/reflex	Rerun, repeat and reflex supported
Electrical requirements	Power requirements: 100–120 VAC 50/60 Hz single phase or 200–240 VAC 50/60 Hz single phase Power consumption: 1,000 VA
Water/waste requirements	Water supply: 3l container Water quality: ≤10µS/cm or ≥0.1 mega Ohm, bacteria-free Liquid waste: 4l container with overflow detection or direct drain Water consumption: Approx. 3l for 250 tests/approx. 12 mL/cycle
Regulatory compliance	GS, CE, UL, C-UL, CB-report and certificate
Operating conditions	Ambient temperature: 8 to 32°C (64.4°F to 89.6°F) Ambient humidity: 20% to 80% Noise output: 60 dbA (stand-by mode), 63 dbA (avg. during operation)
Physical dimensions	Width: 120 to 170 cm (disk/rack) Depth: 73 to 95 cm (disk/rack) Height: 56 cm (w/o PC unit) Weight: Approx. 170 kg (disk) and 210 kg (rack)

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