BS-200 Chemistry Analyzer

Technical Specifications

**System Function:**
- Automatic, Discrete, Random Access
- STAT sample priority
- Throughput: Up to 200 tests/hour (without ISE), up to 330 tests/hour with ISE

**Measuring principles:**
- Absorbance photometry, Turbidimetry, Ion Selective Electrode technology

**Methodology:**
- End-point, Fixed-time, Kinetic, optional ISE
- Single/Dual reagent chemistries, monochromatic/bichromatic linear/non-linear multi-point calibration

**Programming:**
- Open system with user defined profiles and calculation chemistries

**Reagent/Sample Handling:**
- **Reagent/Sample tray:**
  - 40 positions for reagents and 40 positions for samples in refrigerated compartment (2~12°C)
- **Reagent volume:**
  - R1: 10~450μl, step by 1μl
  - R2: 10~450μl, step by 1μl
- **Sample volume:**
  - 2~45μl, step by 0.1μl
- **Reagent/Sample probe:**
  - Liquid level detection, collision protection and inventory checking
- **Probe cleaning:**
  - Automatic washing for both interior and exterior
  - Carry-over < 0.1%
- **Automatic sample dilution:**
  - Pre-dilution and post-dilution
  - Dilution ratio up to 1:200
  - Dilution vessel: Disposable cuvette

**Internal Bar Code Reader (optional):**
- Used for sample and reagent programming
  - Applicable to various bar code systems of Codabar, ITF (Interleaved Two of Five), code128, code39, UPC/EAN, Code93
  - Capable to communicate with LIS in bi-directional mode

**ISE Module (optional):**
- Measure K⁺, Na⁺, Cl⁻
- Throughput: Up to 225 tests per hour

**Reaction System:**
- **Reaction rotor:** Rotating tray, containing 80 cuvettes
- **Cuvette:** Optical length 5mm
- **Reaction volume:** 150~500μl
- **Reaction temperature:** 37°C
- **Temperature fluctuation:** ±0.1°C

**Mixing System:**
- Independent mixing bar

**Optical System:**
- **Light Source:** Halogen-tungsten lamp
- **Wavelength:** 340nm, 405nm, 450nm, 510nm, 546nm, 578nm, 630nm, 670nm
- **Absorption range:** 0~4.0Abs (10mm conversion)
- **Resolution:** 0.0001Abs

**Control and Calibration:**
- **Control software:** Westgard multi-rule, Cumulative sum check, Twin plot

**Operation Unit:**
- **Operation system:** Windows® XP Professional/Home SP2 or above
- **Interface:** RS-232

**Working Conditions:**
- **Power Supply:** AC 200~240V, 50/60Hz, 1000VA or AC 100~130V, 50/60Hz, 1000VA
- **Temperature:** 15~30°C
- **Humidity:** 35~85%
- **Water consumption:** 3.5L/hour
- **Dimension:** Bench top: 860mm (W) x700mm (D) x625mm (H)
  - Floor standing: 860mm (W) x700mm (D) x1160mm (H)
- **Weight:** Bench top: 110 Kg
  - Cabinet (optional): 51 Kg

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Mindray is listed on the NYSE under the symbol "MR"
BS-200
Chemistry Analyzer

- Discrete, random access, fully automated
- 200 tests per hour, up to 330 tests per hour with ISE
- Optional for ISE module and internal bar code reader
- 40 positions for samples and reagents respectively
- Automatic probe cleaning, liquid level detection, collision protection
- Reversed optic system with 8 wavelengths: 340–670nm
- Refrigerated reagent and sample compartment
- Bi-directional LIS interface

Dynamic and Real-time display of running status
- Running status of reagent tray, sample tray and reaction tray
- Real-time monitoring of reagent residual volume
- Probe depth adjusted automatically

Original reaction data record
- Real-time monitoring of reaction curve
- Bichromatic testing to avoid interference
- Simultaneously display primary and secondary wavelengths
- Detailed profile of alert messages
- Real-time diagnosis of system working status

Optimum calibration curve
- Calibration classification:
  - Linear curve type: One-point linear, Two-point linear and Multi-point linear.

High quality ISE Module (optional)
- Measuring K⁺, Na⁺, Cl⁻
- Throughput: up to 225
- 6 months shelf life

Multi-functional sample/reagent tray
- Optional internal reagent/sample bar code reader
- 40 positions for samples and reagents respectively
- Primary tubes and various sample cups can be used, non-fixed positions for samples, control, calibrators and STAT
- 24 hour non-stop cooling with Peltier elements

Disposable reaction cuvettes
- Disposable cuvettes to avoid carry-over and to save operating costs
- Automatic cuvettes blank checking to assure precise results

High performance mixer design
- Avoid cross contamination
- Optimal homogenization in minimum time
- Function immediately (within the same period)
Mindray solution for clinical chemistry

After more than 10 years of research and development on reagents, Mindray can now provide 48 parameters of dedicated reagents (more than 17 others are coming), covering hepatic, renal, cardiac, lipids, diabetes, pancreatitis, inorganic ions and immunoassays, etc., together with original calibrators with metrological traceability as well as controls for BS-200 chemistry analyzer.

**Chemistry Reagents**

**Hepatic**
- Alanine Aminotransferase (ALT)
- Aspartate Aminotransferase (AST)
- Alkaline Phosphatase (ALP)
- γ-GlutamylTransferase (γ-GT)
- Direct Bilirubin (D-Bil) DSA Method
- Direct Bilirubin (D-Bil) VOX Method
- Total Bilirubin (T-Bil) DSA Method
- Total Bilirubin (T-Bil) VOX Method
- Total Protein (TP)
- Albumin (ALB)
- Total Bile Acids (TBA)
- Prealbumin (PA)
- Cholinesterase (CHE)
- Adenosine deaminase (ADA) *
- α-L-fucosidase (AFU) *
- 5’-nucleotidase (5’-NT) *

**Renal**
- Urea (UREA)
- Creatinine (CREA) Modified Jaffé Method
- Creatinine (CREA) Sarcosine Oxidase Method
- Uric Acid (UA)
- Carbon dioxide (CO2)
- Microalbumin *
- β2-Microglobulin (β2-MG) *
- Cystatin C (CysC) *

**Cardiac**
- Creatine Kinase (CK)
- Creatine Kinase-MB (CK-MB)
- Lactate Dehydrogenase (LDH)
- α-Hydroxybutyrate Dehydrogenase (α-HBDH)
- Homocysteine (Hcy)
- Myoglobin *

**Ferrum**
- Iron (Fe)
- Ferritin (FER) *
- Transferin (TRF) *
- Total iron binding capacity / unsaturated iron Binding capacity (TIBC/JIBC) *

**Lipids**
- Total Cholesterol (TC)
- Triglycerides (TG)
- HDL-Cholesterol (HDL-C)
- LDL-Cholesterol (LDL-C)
- Apolipoprotein A1 (ApoA1)
- Apolipoprotein B (ApoB)
- Lipoprotein(a) (Lpa)

**Pancreatitis**
- α-Amylase (α-AMY)
- Lipase (LIP)

**Diabetes**
- Glucose (Glu) GOD-POD Method
- Glucose (Glu) HK Meth
- Hemoglobin A1c (HbA1c)
- Fructosamine (FUN)

**Inorganic ions**
- Calcium (Ca)
- Magnesium (Mg)
- Phosphate Inorganic (P)

**Rheumatism**
- High sensitivity C-reactive protein (hs-CRP) *
- Rheumatoid Factor (RF)
- Antibodies Against Streptolysin O (ASO)

**Immune**
- Immunoglobulin A (IgA)
- Immunoglobulin G (IgG)
- Immunoglobulin M (IgM)
- Immunoglobulin E (IgE) *
- Complement C3 (C3)
- Complement C4 (C4)
- C-Reactive Protein (CRP)

**Others**
- Glucose-6-phosphate dehydrogenase (G6PD) *
- D-dimer *
- Angiotensin converting enzyme (ACE) *
- Retinol binding protein (RBP) *
- D3-hydroxybutyric acid (D3-HB) *

* Coming soon

Original Calibrators with traceability:

Reference Method (Certified by ‘Joint Committee for Traceability in Laboratory Medicine’ (JCTLM))
- International Federation of Clinical Chemistry and Laboratory Medicine (IFCC)
- National Institute of Standards and Technology (NIST)
- Centers for Disease Control and Prevention (CDC, USA)
- American Association for Clinical Chemistry (AACC)

Reference Material
- Institute for Reference Materials and Measurements (IRMM) standards
- National Institute of Standards (NIST) standards
- World Health Organization (WHO) standards
- Japan Committee for Clinical Laboratory (JCCLS) standards