

Valuable and Accessible IT Solutions

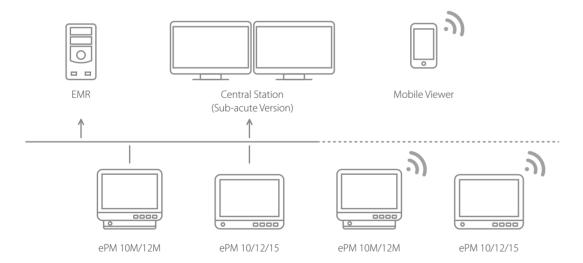
Mindray ePM devices can connect to the Central Monitoring Station (CMS) and eGateway through both wired and wireless networks, as well as interfacing with third-party electronic medical records (EMR) via HL7 output directly.

The ePM helps enhance clinical work flow and efficiency with it's flexible yet reliable connectivity capabilities.

- The View Other Patient function allows caregivers to see, in real-time, up to 12 other beds on a single ePM screen. This seamless information exchange between bedside monitors can help caregivers view all their patients at once, without the need for CMS.
- With the ePM Caregroups function caregivers can quickly find and review their assigned patients or ward when connected to the CMS.

Data from ePM devices can be easily connected to the CMS and Mobile Viewer, giving clinicians access to their patient data anytime and anywhere in the hospital.

- The CMS Early Warning Scores (EWS) dashboard provides an intuitive display of patient status, with dynamic updates pushed to the Mobile Viewer, alerting caregivers to changes in patient conditions and potential risk of deterioration.





ePM 10M/12M

Modular Patient Monitor

The evolution of simplicity



Inspired by the needs of customers, Mindray patient monitors adopt advanced technologies and transform them into accessible innovation. The ePM delivers excellent visual experience, intelligent operation, accurate physiological measurements, smooth workflow and comprehensive connectivity options for demanding hospital settings, such as Emergency Rooms, Recovery Units, Sub-acute Units and General Wards.



Minimalist Design



Multi-touch capacitive screen Supports gestures operations



Wide viewing angle Makes display more visible



1280x800 pixel (10.1"/12.1") Provides HD visual experience



Auto brightness Reduces light interference at night



Fanless design Reduces the risk of cross-contamination



Durable and robust casing Validated for cleaning with 49 leading disinfectants

Extensive Data Storage at the Bedside

2400 hrs Trends @ 10 minutes

48 hrs waveforms for all parameters

3000 sets NIBP measurement **2000** sets Events

OxyCRG events

400 sets

Note: These are the Maximum storage capacity of ePM devices with 16G storage.

Expand Parameters to Meet Your Clinical Needs

- Expanding extension rack supports plug-and-play parameter modules, which are also compatible with Mindray BeneVision N series monitors
- Ergonomic, concealed handle without cleaning blind spot



Wireless Monitoring

ePM 10/12M can upgrade the receiver module to wearable sensor for wireless monitoring, so as to solve the inconveniences caused by monitoring cables and make patients more comfortable.

- Unnoticeable wearing experience
- Reliable design. 1.5m Drop protection. Resistant to 48 kinds of disinfectants. 36h Long battery life
- Medical-grade multi-parameter monitoring
- Innovate health parameter monitoring. Monitoring patient's exercise time, sleep time and fall-down detection





Medical-grade multi-parameter monitoring

Health parameter monitoring

Flexible Mounting Solutions

- A wide range of mounting solutions designed for various clinical settings
- The release mechanism allows for quick removal from the wall mount or rolling stand for transport













Accurate, Reliable Parameters

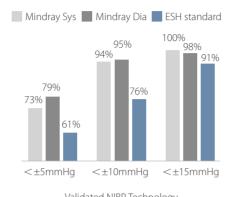
Comprehensive Monitoring

Integrated Platinum™ MPM parameters: 3/5/12-lead ECG, respiration, SpO₂*, temperature and NIBP.

- Multi-lead(4) ECG algorithm with ST & QT analysis
- Low perfusion SpO₂ algorithm
- Fast, accurate and motion tolerant NIBP algorithm, validated by British Hypertension Society (BHS)

Wide measurement range and anti-interference performance ensures excellent parameter accuracy and reliability.

ePM also provides advanced parameter options: 4-ch invasive blood pressure, EtCO₂ and cardiac output, multi-gas and BIS, making it suitable for a wide range of clinical settings.



Validated NIBP Technology BHS evaluation results of NIBP accuracy

Reduce False Alarms with CrozFusion™



Innovative multi-parameter alarm analysis can reduce false arrhythmia alarms and promote the accuracy of heart rate and pulse rate, and help to alleviate alarm fatigue.

1 > 30%

Accuracy of HR & PR

False lethal arrhythmia alarm

False arrhythmia alarm

Note: The results are based on an evaluation by Mindray multi-parameter fusion database.

Intelligent Alarm Strategy

- Alarm highlight: Using special fatal alarm sound. Highlight the fatal alarm
- Alarm limits recommendation: Support personalized threshold settings for different patients based on trend data
- ARR Alarm refractory period: Avoid repeated meaningless alarm



Simplicity at Your Fingertips

Intelligent Operation Experience

- Operate with gestures, just like a tablet PC
- Access to the most common functions in 2 steps or fewer
- Quickly identify disconnected sensors with the innovative AlarmSight technology
- Screen lock for easy cleaning



Smooth Workflow

Based on clinical insight, the ePM has optimized workflows to support caregivers at the bedside, swiping the touchscreen to switch between commonly used functions and interfaces, enabling clinical tasks to be completed quickly and accurately.



View from a distance Intuitive big numerics



View at bedside Highlights abnormal readings





Ward rounds or nurses hand over Quickly review the patient status changes



Review and analyze 24hrs waveform review and critical alarms

^{*} Mindray provides 3 options of SpO, measurement, Mindray, Masimo and Nellcor. For further information about the availability of Masimo and Nellcor SpO., please contact with your local sales representitives.

Early Warning Scoring (EWS)

Mindray ePM monitors provide a point-of-care EWS calculator to help clinicians track and document signs of patient deterioration, aiding faster and more informed patient care decisions.

- Compliant with the National Early Warning Score (NEWS), National Early Warning Score 2 (NEWS2) and Modified Early Warning Score (MEWS) protocols
- Alternatively, create custom protocols to suit your hospital requirements
- Intuitive layout and trends review helps caregivers visualize data quicker
- Automate EWS calculations quickly at the bedside
- Display score escalation instructions on-screen to remind caregivers make rapid care decisions
- Integration to the Electronic Medical Record (EMR) for fast, accurate electronic vitals and early warning scoring documentation



The Early Warning Score tool, as displayed on ePM devices

Clinical Assistive Applications (CAA)

The ePM provides efficient Clinical Assistive Applications (CAA) to help support safe and efficient decision making in mid-acuity and general ward areas.



ST Graphic ™

Glasgow Coma Scale

24 hours ECG summary

Supporting Safety in Neonates

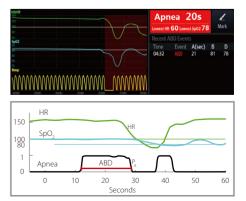


Targeted Goal Screen

- Target parameter dashboard, visualized goal management such as oxygen therapy.
- 24 hours of target parameter statistics helps caregivers to evaluate the treatment effects
- Target parameter trend helps clinicians to identify patient situaiton. Highlighted part is combined with certain bar in the histogram

OxyCRG

- Effectively identify apnea of prematurity as ABD event
- Detailed and complete records of events help caregivers quickly identify the cause





ePM 10M/12M

Patient Monitor

Data Sheet



Physical Specifications Weight

ePM 10M: 4.0 kg ePM 12M: 4.8 kg

(Standard configuration, excluding

modules, recorder, battery and accessories.)

ePM 10M: 269 x252 x159mm

ePM 12M: 310 x289 x169mm
Display screen Capacitive screen, support multi-touch

operation.

ePM 10M: 10.1-inch, 1280 x 800 pixels ePM 12M: 12.1-inch, 1280 x 800 pixels ePM 10M: Up to 8 waveform channels

ePM 12M: Up to 10 waveform channels

ECG

Display channel

Size

Meet standards of IEC 60601-2-27 and IEC 60601-2-25.

Lead set 3-lead: I, II, III

5-lead: I, II, III, aVR, aVL, aVF, V ** 6-lead: I, II, III, aVR, aVL, aVF, Va, Vb 12-lead: I, II, III, aVR, aVL, aVF, V1 to V6 Automatic 3/5/6/12 - lead recognition.

Input signal range ± 10 mV (p-p)

Electrode offset potential tolerance ± 800 mV

Sweep speed 6.25 mm/s, 12.5 mm/s, 25 mm/s, 50 mm/s
Gain x 0.125, x 0.25, x 0.5, x 1, x 2, x 4, auto

Waveform format Standard, Cabrera

Bandwidth Diagnostic mode: 0.05 to 150 Hz

Monitor mode: 0.5 to 40 Hz Surgical mode: 1 to 20 Hz ST mode: 0.05 to 40 Hz Diagnostic mode: > 90 dB

Monitor, Surgical, ST mode: > 105 dB

Monitor, Surgical, ST mode. > 105 db

Pace Detection Amplitude: ± 2 mV to ± 700 mV

Width: 0.1 to 2 ms Rise time: 10 to 100 us

Defib. protection Withstand 5000V (360J) defibrillation

Recovery time <5 s Multi-lead(4) algorithm Yes

Provides Glasgow resting 12-lead ECG algorithm

Heart Rate

HR accuracy

CMRR

HR range Adult: 15 to 300 bpm

Pediatric/Neonate: 15 to 350 bpm ± 1 bpm or ± 1%, whichever is greater.

HR resolution 1 bpm

Arrhythmia Analysis

Intended use for adult, pediatric and neonate.

Multi-lead, 27 classifications. Asystole, VFib/VTac, Vtac, Vent. Brady, Extreme Tachy, Extreme Brady, Vrhythm, PVCs/min, Pauses/min, Couplet, Bigeminy, Trigeminy, R on T, Run PVCs, PVC, Tachy, Brady, Missed Beats, PNP, PNC, Multif. PVC, Nonsus. Vtac, Pause, Irr. Rhythm.,

Afib (for adult only), SVT, SVCs/min.

ST Segment Analysis

Intended use for adult, pediatric and neonate.

ST range - 2.5 to + 2.5 mV

ST accuracy \pm 0.02 mV or \pm 10%, whichever is greater

(- 0.8 to + 0.8 mV)

ST resolution 0.01 mV

QT Analysis

Intended use for adult, pediatric, and neonate.

Parameters QT, QTc, ΔQTc

QTc formula Bazett, Fridericia, Framingham, or Hodges

 QT/QTc range
 200 to 800 ms

 QT accuracy
 ± 30 ms

 QT resolution
 4 ms

 QTc resolution
 1 ms

QT-HR range Adult: 15 to 150 bpm

Pediatric/Neonate: 15 to 180 bpm

Respiration

Lead I or II, auto RR range 0 to 200 rpm

RR accuracy ± 1 rpm (0 to 120 rpm) ± 2 rpm (121 to 200 rpm)

RR resolution 1 rpm

Sweep speed 3 mm/s, 6.25 mm/s, 12.5 mm/s, 25 mm/s,

50 mm/s

Apnea time 10 s, 15 s, 20 s, 25 s, 30 s, 35 s, 40 s

SpO₂

Meet standards of ISO 80601-2-61.

Module Mindray, Masimo, Nellcor

Range 0 to 100 %

Resolution 1%

Accuracy

Mindray/Nellcor: ± 2 % (70 to 100%, Adult/Pediatric:)

± 3 % (70 to 100%, Neonate)

Unspecified (0 to 69%)

Masimo: ± 2 % (70 to 100%, Adult/Pediatric, non-

motion)

± 3 % (70 to 100%, Neonate, non-motion)

± 3 % (70 to 100%, motion) Unspecified (1 to 69%)

Perfusion index (PI) Yes, for Mindray/Masimo SpO₂

Pitch Tone Yes PR Refresh Rate 1 sec

PR

PR range 20 to 300 bpm (from Mindray/Nellcor SpO₂)

25 to 240 bpm (from Masimo SpO₂)

20 to 350 bpm (from IBP) 30 to 300 bpm (from NIBP)

PR accuracy ± 3 bpm (20 to 300 bpm, from Mindray SpO₂)

± 3 bpm (20 to 250 bpm, from Nellcor SpO₂) ± 3 bpm (non-motion, from Masimo SpO₂) ± 5 bpm (motion, from Masimo SpO₂)

 ± 1 bpm or ± 1 %, whichever is greater (from IBP)

± 3 bpm or ±3 %, whichever is greater

(from NIBP)

Refreshing rate $\leq 1 \text{ s}$

Temperature

Diastolic range

Mean range

Meet standard of ISO 80601-2-56.

Technique Thermal resistance

Channels 2 channels

Temp range 0 to 50 °C (32 to 122 °F)

Temp accuracy \pm 0.1 °C or \pm 0.2 °F (without probe)

Temp resolution 0.1 °C Refreshing rate ≤ 1 s

NIBP

Meet standards of ISO 80601-2-30.
Technique Oscillometry

Operation mode Manual, Auto, STAT, Sequence Parameters Systolic, diastolic, mean

Max measurement time Adult/Pediatric: 180 s, Neonate: 90 s

Systolic range Adult: 25 to 290 mmHg
Pediatric: 25 to 240 mmHg

Neonate: 25 to 140 mmHg Adult: 10 to 250 mmHg Pediatric: 10 to 200 mmHg

Neonate: 10 to 115 mmHg Adult: 15 to 260 mmHg Pediatric: 15 to 215 mmHg Neonate: 15 to 125 mmHg

NIBP accuracy Max mean error: ± 5 mmHg

Max standard deviation: 8 mmHg

NIBP resolution 1 mmHg
Assisting venous puncture Yes

IBP

 $\begin{tabular}{lll} Meet standard of IEC 60601-2-34. \\ Channels & Up to 4 channels \\ Sensitivity & 5 <math>\mu V/V/mmHg$ \\ Impedance range & 300 to 3000 Ω IBP range & -50 to 360 mmHg

IBP accuracy ± 1 mmHg or ± 2 %, whichever is greater

IBP resolution 1 mmHg
PPV range 0 to 50 %
PAWP Yes
ICP measurement Yes
Support waveforms overlapping.

C.O. Technique Infrared absorption, paramagnetic Thermodilution Technique properties for O₂ monitoring C.O. range 0.1 to 20 L/min Gas CO₂, O₂, N₂O, Des, Iso, Enf, Hal, Sev C.O. accuracy ±0.1 L/min or ±5%, whichever is greater Warm-up time ISO accuracy mode: 45 s C.O. resolution 0.1 L/min Full accuracy mode: 10 min TB range 23 to 43 °C Sample flow rate (with DRYLINE II ™ watertrap) 0 to 27 °C Adult/pediatric watertrap: 200 ml/min TI range TB, TI accuracy ± 0.1 °C (without sensor) Neonate watertrap: 120 ml/min TB, TI resolution 0.1 °C Sample flow rate accuracy ±10 ml/min or ±10%, whichever is Artema Sidestream CO₂ Meet standard of ISO 80601-2-55. < 4 s **Delay time** **Options: Paramagnetic O2 sensor. Response time DRYLINE II ™ watertrap for adult/pediatric, CO₂ sample flow rate 200 ml/min: 120 ml/min (DRYLINE II ™ watertrap for adult/pediatric) CO2: < 4.2 s 90/70 ml/min (DRYLINE II ™ watertrap for neonate) N₂O: ≤ 4.3 s Enf/Iso/Hal/Sev/Des: ≤ 4.5 s CO₂ sample flow rate accuracy \pm 15 ml/min or \pm 15 %, whichever is greater. Q_2 : < 4 s DRYLINE II ™ watertrap for neonate, CO₂ Response time ≤ 5.0 s @ 120ml/min (for adult/pediatric) ≤4.5 s @ 90 ml/min (for neonate) 120 ml/min: ≤ 5.0 s @ 70 ml/min (for neonate) CO_2 : $\leq 4 s$ O₂ Response time ≤ 5.0 s @ 120 ml/min N₂O: ≤ 4.2 s ≤ 4.5 s @ 90ml/min O₂: ≤ 4 s Enf/Iso/Hal/Sev/Des: ≤ 4.4 s Sweep speed 3 mm/s, 6.25 mm/s, 12.5 mm/s, 25 mm/s, 50 mm/s CO₂ range 0 to 30 % 0 to 150mmHg ±0.1%ABS (0 to 1%) CO₂ range CO₂ accuracy CO₂ accuracy Full accuracy mode: ±0.2%ABS (1 to 5%) 0 - 40 mmHg: ± 2 mmHg ±0.3%ABS (5 to 7%) 41 - 76 mmHg: ± 5% of reading ±0.5%ABS (7 to 10%) 77 - 150 mmHg: ± 10% of reading O₂ range 0 to 100 % O₂ accuracy ±1%ABS (0 to 25%REL) ISO accuracy mode: Add ± 2 mmHg to the full accuracy mode ±2%ABS (25 to 80%REL) CO₂ resolution ±3%ABS (80 to 100%REL) 1 mmHa O₂ range 0 to 100 % N₂O range 0 to 100 % ±2%ABS (0 to 20%REL) O₂ accuracy \pm 1 % (0 to 25 %) N₂O accuracy \pm 2 % (25.1 to 80 %) ±3%ABS (20 to 100%REL) \pm 3 % (80.1 to 100 %) Enf/Iso/Hal/Sev/Des range 0 to 30 % 2 to 100 rpm O₂ resolution 0.1 % awRR range awRR range 0 to 150 rpm awRR accuracy ±1 rpm (2 to 60 rpm) awRR accuracy ± 1 rpm (0 to 60 rpm) Apnea time 10 s, 15 s, 20 s, 25 s, 30 s, 35 s, 40 s ± 2 rpm (61 to 150 rpm) Provide MAC value (support calibrated by age). Apnea time 10 s, 15 s, 20 s, 25 s, 30 s, 35 s, 40 s Support two mixed gas identify and monitoring. Oridion Microstream CO₂ Meet the standard of IEC 60601-2-10 Meet standard of ISO 80601-2-55. Sample flow rate 50 ^{-7.5}+15 ml/min **Sensor Type** Acceleromyography sensor Initialization time 30 s (typical) **Stimulation Modes** ST, TOF, PTC, DBS3.2, DBS3.3 Stimulation Current Range 0 to 60 mA Response time 2.9 s (typical) 3 mm/s, 6.25 mm/s, 12.5 mm/s, 25 mm/s, Sweep speed **Stimulation Current Accuracy** 50 mm/s $\pm 5\%$ or ± 2 mA, whichever is greater. CO₂ range 0 to 150 mmHg **Stimulation Pulse Width** ±2 mmHg (0 to 38 mmHg) CO₂ accuracy 100,200 or 300 µs, monophasic rectangle pulse Stimulation Pulse Width Accuracy ±10 % ±5 % of the reading (0.08 % increased in error for every 1 mmHg if the reading is more than Max. Output Voltage 300 V 38mmHg) (39 to 99 mmHg) BISx/BISx4 awRR range 0 to 150 rpm Meet standard of IEC 60601-2-26. Technique **Bispectral Index** awRR accuracy ±1 rpm (0 to 70 rpm) Impedance range >5 MΩ ±2 rpm (71 to 120 rpm) 0.25 to 100 Hz ±3 rpm (121 to 150 rpm) **EEG** bandwidth Apnea time 10 s, 15 s, 20 s, 25 s, 30 s, 35 s, 40 s **BIS** range 0 to 100 (BIS, BIS L, BIS R) Capnostat Mainstream CO₂ **SQI** range 0 to 100 % (SQI, SQI L, SQI R) Meet standard of ISO 80601-2-55. **ASYM** 0 to 100% Rise time < 60 ms **DSA trend** Yes 3 mm/s, 6.25 mm/s, 12.5 mm/s, 25 mm/s, **Data Review** Sweep speed 50 mm/s For 2G storage CO₂ range 0 to 150 mmHg Trends data Up to 120 hours @ 1min Up to 1000 events, including parameter alarms, CO₂ accuracy ±2 mmHg (0 to 40 mmHg) Events ±5 % of the reading (41 to 70 mmHg) arrhythmia events technical alarms, and so on. ±8 % of the reading (71 to 100 mmHg) NIRP Up to 1000 sets ±10 % of the reading (101 to 150 mmHg) **Full disclosure** 48 hours at Maximum. The specific storage awRR range time depends on the waveforms stored and 0 to 150 rpm awRR accuracy the number of stored waveforms.

For 16G storage

Up to 240 hours @ 1min, 2400 hours @ 10 min

Trends data

Multi-gas

Meet standard of ISO 80601-2-55.

Events Up to 2000 events, including parameter alarms,

arrhythmia events technical alarms, and so on.

NIBP Up to 3000 sets

Full disclosure 48 hours for all parameter waveforms.

For 2G & 16G storage

Interpretation of resting 20 sets of 12-lead ECG results

OxyCRG 400 OxvCRG events ST review Up to 120 hours @ 1 min

Minitrend Yes

Alarms

Audible indicator Yes, 3 different alarm tones, and prompt

Visible indicator Red/yellow/cyan LED, and alarm message

display

Provide AlarmSight infographic alarm indicator.

Alarm limits recommendation

Alarm highlight: Support the alarm escalation. Using special fatal alarm sound. Highlight and optimize the fatal alarm display on the screen

Special Functions

Clinical Assistive Application (CAA): ST Graphic ™, EWS, GCS, 24h ECG

summary, NIBP analysis, AF Summary.

Calculations (Drug, Hemodynamic, Oxygenation, Ventilation, Renal),

and Titration table.

Wi-Fi Communications

Protocol IEEE 802.11a/b/g/n Modulation mode **DSSS and OFDM**

Operating frequency IEEE 802.11b/g/n (2.4G):

ETSI/FCC/KC: 2.4 to 2.483 GHz

MIC: 2.4 to 2.495 GHz IEEE 802.11a/n (5G):

ETSI: 5.15 to 5.35 GHz, 5.47 to 5.725 GHz FCC: 5.15 to 5.35 GHz, 5.725 to 5.82 GHz

MIC: 5.15 to 5.35 GHz

KC: 5.15 to 5.35 GHz, 5.47 to 5.725 GHz,

5.725 to 5.82 GHz

5 MHz @ 2.4 GHz, 20 MHz @ 5 GHz **Channel spacing**

Wireless baud rate IEEE 802.11a: 6 to 54 Mbps

IEEE 802.11b: 1 to 11 Mbps IEEE 802.11g: 6 to 54 Mbps IEEE 802.11n: 6.5 to 72.2 Mbps

Output power < 20dBm (CE requirement: detection

mode-RMS)

< 30dBm (FCC requirement: detection

mode- peak power)

Operating mode Infrastructure

WPA-PSK, WPA2-PSK, WPA-Enterprise, **Data security**

WPA2-Enterprise (EAP-FAST. EAP-TLS, EAP-TTLS, PEAP-GTC, PEAP-MSCHAPv2, PEAP-TLS,

LEAP)

Encryption: TKIP and AES

Interfacing

Main unit AC power connector (1)

VGA port (1)

Network connector (1), RJ45 USB 2.0 connector (2)

Analog output/nurse call/defib. Sync. Port (1)

Integrated module rack (1), for 2 slots

Barcode scanner Support 1D and 2D barcode

Remote control Support Thermal recorder 3 traces (paper 50 mm width, 20 m length) **Network printer**

Support

Power

Line voltage 100 to 240 VAC (±10 %)

Maximum current 2.0A

Frequency 50/60 Hz (±3 Hz)

Rechargeable lithium-ion battery, **Battery**

2600mAh/4500mAh

Rechargeable smart lithium-ion battery

5600mAh

ePM 10M/12M>2 hours run time (2600mAh) ePM 10M/12M>4 hours run time (4500mAh) ePM 10M>6 hours run time (5600mAh x1) ePM 12M>4.5 hours run time (5600mAh x1) ePM 12M>9 hours run time (5600mAh x2)

2.5 hours to 90%(2600mAh) Recharge time (power off)

5 hours to 90% (4500mAh) 5 hours to 90% (5600mAh x1) 10 hours to 90% (5600mAh x2)

Environmental Requirements

Temperature Operating: 0 to 40 °C (without AG),

10 to 40 °C (with AG)

Storage: -20 to 60 °C

Humidity Operating: 15 to 95 % (non condensing)

Storage: 10 to 95 % (non condensing)

Barometric Operating: 427.5 to 805.5 mmHg

(57.0 to 107.4 kPa)

Storage: 120 to 805.5 mmHg

(16.0 to 107.4 kPa)

Wireless Monitoring

Drop test

Protection against

3-lead ECG, Resp, SpO2, PR, NIBP, Temp, **Parameters**

Exercise time, Sleep time, Fall down detection

Weight EP30 Main unit: 60g

ES30 ECG unit: 31g BP20 NIBP Module: 165a

R20: 235g

Size EP30 Main unit: 61.5*49*18 mm

ES30 ECG unit: 46.5*46.5*12.5 mm BP20 NIBP Module: 119*60*19 mm

R20: 150*50*120 mm EP30 Main unit: 1.5m ES30 ECG unit: 1.5m

BP20 NIBP Module: 1.5m

EP30 Main unit: IP24, EP30: IP22 ES30 ECG unit: IP24

RP20 NIRP module: IPX2

R20: IPX1

Run time EP30: 36 hours

ES30: 72 hours

BP20: 600 NIBP measurements

Some of functions marked with an asterisk may not be available. Please contact your local Mindray sales representative for the most

current information.



