BeneVision™

See more With ease

BeneVision™ N22/N19

Patient Monitor

Change your perspective, again.
Maximize your confidence.
Built for a paperless future.

www.mindray.com

P/N: ENG-BeneVision N22/N19-210285x14Px20190129

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healthcare within reach

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BeneVision N22/N19

Patient monitor

Always in sight, always in mind

iF DESIGN AWARD 2016

BeneVision.
Change your perspective, again.

BeneVision N22/N19

At Mindray, we believe the best way to predict the future is to create it today. We're thinking how to help you save your time in order to treat more patients effectively. We also focus on clinical safety, and efficiency. Now for the first time in the world, the BeneVision patient monitor ROTATES between landscape and portrait. You have both higher and wider clinical views when patient care demands them.

Design.
Excellence for visionaries.

Original technology innovations have been combined with thoughtful considerations to improve patient monitoring experience.

During the design process, we strove to make the details “and” instead of “or”, such as the ingenious portrait and landscape display, as well as the single-level menu user interface.

Modular design brings so many options.

- Parameter modularity allows you flexibility in patient care and makes the most of your equipment investment.
- iView module combines a powerful, embedded PC and the patient monitor in the same unit. The innovative design optimizes cooling without the need for a fan.
- Ultra-compact main unit and big screen can be used as a combined unit or separated to make use of the rotating screen feature.

Auto Built-in No fan Seamless

Innovative.
Maximize your confidence.

Everyday, Mindray delivers accurate, real-time, physiological measurement data from millions of patients worldwide, which clinicians have come to rely on when making decisions. BeneVision provides the worlds best monitoring technologies for you and promotes new ones continuously.

Cardiology

ΔST monitoring and ST segment templates.
Real-time QT/QTc measurement.
Glasgow 12-lead resting interpretation.

Hemodynamics and volumetric

Less-invasive PiCCO and $ScvO_2$ monitoring.
Non-invasive cardiac output with ICG module.

Airway gas and lung mechanics

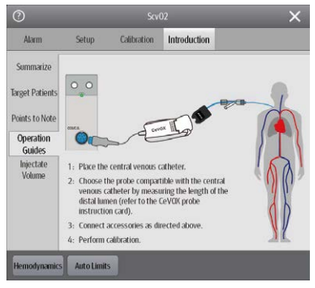
One-slot CO_2+O_2 module
Volumetric CO_2 and metabolic measurements
AION Multi-Gas +SPIRIT respiratory mechanics

Tissue perfusion

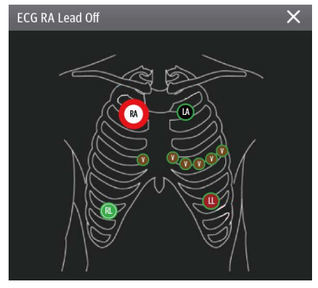
INVOS rSO_2 provides a noninvasive and continuous reading of changes in regional oxygen saturation of blood in tissue microvascular circulation.

Neurology

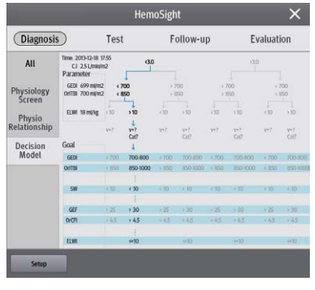
EEG, and BIS/BISx4 monitoring.
Advanced NMT monitoring technology can detect movement in all directions accurately.



Online Guide



Infographic alarm



HemoSight™
Help clinicians to make decisions through sets of hemodynamic assistance applications.

ST Graphic™
Quickly and accurately detect changes in ST values for analysis.

Comparison review
Events summary and details ease contextual evaluation.

Mobility.
Streamlined.

Since the introduction of the world's first portable cardiac monitor in 1964, Mindray has committed itself to being the pioneer in early patient mobilization for better recovery. BeneVision extends the typical mobile monitoring solution with more wireless roaming, data continuity, and streamlined workflow in every situation. Combined with its patient-worn telemetry monitor, which is also a cableless measurement module, BeneVision ensures a supreme level of mobility and offers more freedom to both patient and caregiver.

BeneVision N22/N19 wirelessly pairs with its TM80 and BP10 patient-worn modules for cableless measurement at the bedside and beyond.

Ambulatory patients monitored around the bedside and beyond.

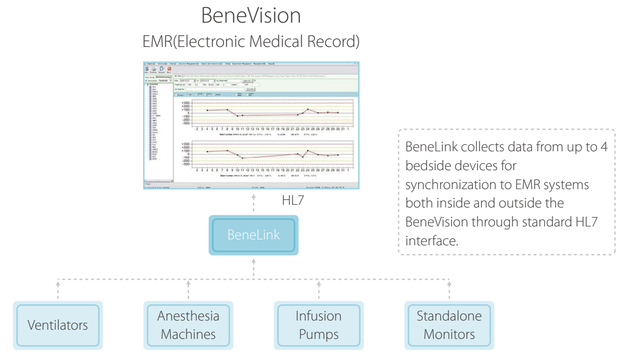
The Mindray classical transport monitoring solution with BeneVision N1 also works seamlessly with BeneVision for unmatched patient safety.

Connected.
Built for a paperless future.

As a pioneer in clinical informatics with patient monitoring, Mindray integrated the embedded PC (iView) in 2007, which enables a patient monitor to run user APPs for the first time in the world. BeneVision enhances the iView open platform with a more intuitive display, modular design, and powerful performance. Patient monitoring and healthcare applications are combined into one workstation at the point of care.

Mindray provides a flexible solution for monitoring your patient's status anywhere, anytime, even when you are away from the clinical environment…Based on layer 3 network structure, the Mindray patient monitoring system has a high network adaptability to integrate seamlessly with your hospital's current network.

With Mindray's central station and eGateway further connecting BeneVision with your clinical world, bedside device data and other clinical system data is shared to enhance your diagnosis and clinical decision making.



iView can run your own clinical Apps (such as PACS, LIS, HIS/CIS, and EMR) on one intuitive view and connects with your hospital network infrastructure directly without any additional server or gateway.

With its 1680 x 1050 pixels 22-inch screen, BeneVision N22 has a perfect split layout in portrait display. No need to worry that the waveforms will be obstructed by the iView application window as you browse the patient's information.

Adult:	15 to 260 mmHg
Pediatric:	15 to 215 mmHg
Neonate:	15 to 125 mmHg
Accuracy	
Max Mean Error:	± 5 mmHg
Max Standard Deviation:	8 mmHg
Cuff Deflation Technique	Step bleed
Initial Cuff Inflation	
Adult:	80 to 280 mmHg (default: 160 mmHg)
Pediatric:	80 to 210 mmHg (default: 140 mmHg)
Neonate:	60 to 140 mmHg (default: 90 mmHg)
Over Pressure Protection	
Adult/ Pediatric:	297 ± 3 mmHg
Neonate:	147 ± 3 mmHg
Max Measurement time	
Adult/Pediatric:	180 sec
Neonate:	90 sec
Assisting Venous Puncture	Yes
Pulse Rate Range	30 to 300 bpm
Pulse Rate Accuracy	± 3 bpm or ± 3 %, whichever is greater

IBP

Meet standard of IEC 60601-2-34.

Number	Up to 8 channels
Measurement Range	-50 to 360 mmHg
Resolution	1 mmHg
Accuracy	± 1 mmHg or ±2 %, whichever is greater (excluding sensor error)
Sensitivity	5 µV/V/mmHg
Impedance Range	300 to 3000 Ω
PPV Range	0 to 50 %
PAWP	Yes
ICP measurement	Support

Support waveforms overlapping.

Pulse Rate Range	25 to 350 bpm
Pulse Rate Accuracy	±1 bpm or ±1 %, whichever is greater

Cardiac Output

Method	Thermodilution
Measurement Range	0.1 - 20 L/min
Resolution	0.1 L/min
Accuracy	±0.1 L/min or ±5%, whichever is greater
TB Range	23 to 43 °C / 73.4 to 109.4 °F
TB, TI Accuracy	± 0.1 °C (without sensor)
TB, TI Resolution	0.1 °C

PiCCO

Parameters	Measurement Range	Coefficient of Variation
CCO	0.25 to 25.0 L/min	≤ 2%
C.O.	0.25 to 25.0 L/min	≤ 2%
GEDV	40 to 4800 ml	≤ 3%
SV	1 to 250 ml	≤ 2%
EVLW	10 to 5000 ml	≤ 6%
ITBV	50 to 6000 ml	≤ 3%

(Coefficient of variation is measured using synthetic and/or database wave forms (laboratory testing.) Coefficient of variation= SD/mean error.)

TB Range	23 to 43 °C / 73.4 to 109.4 °F
TB, TI Accuracy	± 0.1 °C (without sensor)
TB, TI Resolution	0.1 °C
pArt/pCVP Range	-50 to 300 mmHg
pArt/pCVP Accuracy	± 1 mmHg or ± 2 %, whichever is greater

$ScvO_2$

Range	0 to 99 %
Accuracy	± 3% (50 to 80 %)

ICG

Method	Thoracic electrical bioimpediance (TEB)
HR Range	40 to 200 bpm (ICG), accuracy ±2 bpm
C.O. Range	1.0 to 15 L/min
SV Range	5 to 250 ml

Provides Monitoring Parameters ACI, VI, PEP, LVET, TFI, TFC, HR, C.O., C.I., SV, SVI, SVR, SVRI, PVR, PVRI, LCW, LCWI, LVSW, LVSWI, STR, VEPT

Continuous Cardiac Output Interface

Measured Parameter	Consistent with CCO-related parameters outputted by Vigilance II®, Vigileo™, EV1000 or HemoSphere

Artema Sidestream CO_2

Meet standard of ISO 80601-2-55.

Measurement Range	
$etCO_2$:	0 to 150 mmHg
O_2 (optional):	0 to 100 %
CO_2 Accuracy	
0 to 40 mmHg:	± 2mmHg
41 to 76 mmHg:	± 5% of reading
77 to 99 mmHg:	± 10% of reading
100 to 150 mmHg:	± (3 mmHg+8% of reading)
O_2 Accuracy	
0 to 25 %:	±1 %
25.1 to 80 %:	±2 %
80.1 to 100 %	±3 %
Resolution	
$etCO_2$:	1 mmHg
O_2 (optional):	1 %
Sample Flow Rate	
Adult/Pediatric:	120 ml/min (with or without O_2 monitoring)
Neonate:	70 ml/min or 90 ml/min, selectable
	90 ml/min (with O_2 monitoring)
Sample Flow Rate Tolerance	
	±15 ml/min or ±15 %, whichever is greater.
Warm-up Time	90 sec (maximum), 20 sec (typically)

Measured with a neonatal watertrap and 2.5-meter neonatal sampling line, or an adult watertrap and a 2.5-meter adult sampling line:

Rise Time	
$etCO_2$:	≤ 250 ms @ 70 ml/min (Neonate watertrap)
	≤ 250 ms @ 90 ml/min (Neonate watertrap)
	≤ 300 ms @ 120 ml/min (Adult watertrap)
O_2 (optional):	≤ 800 ms @ 90 ml/min (Neonate watertrap)
	≤ 750 ms @ 120 ml/min (Adult watertrap)
Sampling Delay Time	
$etCO_2$:	≤ 5.0 sec @ 70 ml/min (Neonate watertrap)
	≤ 4.5 sec @ 90 ml/min (Neonate watertrap)
	≤ 5.0 sec @ 120 ml/min (Adult watertrap)
O_2 (optional):	≤ 4.5 sec @ 90 ml/min (Neonate watertrap)
	≤ 5.0 sec @ 120 ml/min (Adult watertrap)
awRR Range	0 to 150 rpm
awRR Accuracy	
0 to 60 rpm:	± 1 rpm
61 to 150 rpm:	± 2 rpm
Apnea Time	10, 15, 20, 25, 30, 35, 40 sec

Provide VCO_2, VO_2, $MVCO_2$, MVO_2, EE, RQ parameters, when monitoring with RM module.

Oridion Microstream CO_2

Measurement Range	0 to 99 mmHg
Resolution	1 mmHg
Accuracy	
0 to 38 mmHg:	±2 mmHg
39 to 99 mmHg:	±5 % + 0.08 % of the reading – 38 mmHg
Sample Flow Rate	$50\ ^{-7.5}_{+15}$ ml/min
Start-up Time	30 sec (typical)
Response Time	2.9 s (typical)
awRR Range	0 to 150 rpm
awRR Accuracy	
0 to 70 rpm:	±1 rpm
71 to 120 rpm:	±2 rpm
121 to 150 rpm:	±3 rpm
Apnea time	10, 15, 20, 25, 30, 35, 40 sec

Capnostat Mainstream CO_2

Measurement Range	0 to 150 mmHg
Resolution	1 mmHg
Accuracy	
0 to 40 mmHg:	± 2mmHg
41 to 70 mmHg:	± 5% of reading
71 to 100 mmHg:	± 8% of reading
101 to 150 mmHg:	± 10% of reading
Rise time	< 60 msec
awRR Range	0 to 150 rpm
awRR Accuracy	±1 rpm

Provide VCO_2, $MVCO_2$, $FeCO_2$, $SlopeCO_2$, Vtalv, MValv, Vdaw, Vdaw/Vt, Vdalv, Vdalv/Vt, Vdphy, Vd/Vt, when monitoring with RM module.

Anesthesia Gases

Meet standard of ISO 80601-2-55.

Sampling Rate	
Adult/pediatric:	200 ml/min
Neonate:	120 ml/min
Sampling Rate Tolerance	±10 ml/min or ±10%, whichever is greater.
Sampling Delay Time	< 4 sec
Refresh Rate	1 sec
Warm-up Time	45 sec to warm-up status
	10 min to ready-to-measure status
Measurement Range	
CO_2:	0 to 30 %
N_2O:	0 to 100 %
Des/Sev/Enf/Iso/Hal:	
	0 to 30 %
O_2:	0 to 100 %
awRR:	2 to 100 rpm
Resolution	
CO_2:	0.1 %
N_2O:	1 %
Des/Sev/Enf/Iso/Hal:	
	0.1 %
O_2:	1 %

awRR:	1 rpm	

Full Accuracy

Gases	Range (%REL)	Accuracy (%ABS)
CO_2:	0 to 1 %	± 0.1 %
	1 to 5 %	± 0.2 %
	5 to 7 %	± 0.3 %
	7 to 10 %	± 0.5 %
	> 10 %	Not specified
N_2O:	0 to 20 %	± 2 %
	20 to 100 %	± 3 %
Des:	0 to 1 %	± 0.15 %
	1 to 5 %	± 0.2 %
	5 to 10 %	± 0.4 %
	10 to 15 %	± 0.6 %
	15 to 18 %	± 1 %
	> 18 %	Not specified
Sev:	0 to 1 %	± 0.15 %
	1 to 5 %	± 0.2 %
	5 to 8 %	± 0.4 %
	> 8 %	Not specified
Enf/Iso/Hal:	0 to 1 %	± 0.15 %
	1 to 5 %	± 0.2 %
	> 5 %	Not specified
O_2:	0 to 25 %	± 1 %
	25 to 80 %	± 2 %
	80 to 100 %	± 3 %
awRR:	2 to 60 rpm	± 1 rpm
	> 60 rpm	Not specified

Rise Time

Sampling flow 120 ml/min, using the DRYLINE II ™ watertrap and a neonatal 2.5m sampling line,

CO_2/ N_2O:	≤ 250 ms
Iso/Hal/Sev/Des:	≤ 300 ms
Enf:	≤ 350 ms
O_2:	≤ 600 ms

Sampling flow 200ml/min, using DRYLINE II ™ watertrap and an adult 2.5m sampling line:

CO_2/ N_2O:	≤ 250 ms
Iso/Hal/Sev/Des:	≤ 300 ms
Enf:	≤ 350 ms
O_2:	≤ 500 ms

Sampling Delay Time

Sampling flow 120 ml/min, using the DRYLINE II ™ watertrap and a neonatal 2.5m sampling line,

CO_2:	≤ 4 sec
N_2O:	≤ 4.2 sec
O_2:	≤ 4 sec

Enf /Iso/Hal/Sev/Des: ≤ 4.4 sec

Sampling flow 200ml/min, using DRYLINE II ™ watertrap and an adult 2.5m sampling line:

CO_2:	≤ 4.2 sec
N_2O:	≤ 4.3 sec
O_2:	≤ 4 sec

Enf/Iso/Hal/Sev/Des: ≤ 4.5 sec

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

Provide MAC value (support calibrated by age).

Support two mixed gas identify and monitoring.

RM

Method	Diff-Pressure flow
Measurement Range	
Flow	Adult/Pediatric: ± (2 to 120) L/min
	Neonate: ± (0.5 to 30) L/min
Paw	-20 to 120 cmH_2O
MVe/MVi	Adult/Pediatric: 2 to 60 L/min
	Infant: 0.5 to 15 L/min
TVe/TVi	Adult/Pediatric: 100 to 1500 ml
	Infant: 20 to 500 ml
awRR range	4 to 120 rpm
Resolution	
Flow	0.1 L/min
Paw	0.1 cmH_2O
MVe/MVi	0.01 L/min (MVe/MVi < 10 L/min)
	0.1 L/min (MVe/MVi ≥ 10 L/min)
TVe/TVi	1 ml
awRR:	1 rpm
Accuracy	
Flow	Adult/Pediatric: ± 1.2 L/min or ± 10% of the reading, whichever is greater.
	Neonate: ± 0.5 L/min or ± 10%, whichever is greater.
Paw	± 3% of reading
MVe/MVi	± 10% of reading
TVe/TVi	Adult/Pediatric: ±10% or ±15 ml, whichever is greater.
	Infant: ±10% or ±6 ml, whichever is greater.
awRR:	±1 rpm (4 to 99 rpm)
	±2 rpm (100 to 120 rpm)

Provide loops display.

Monitoring parameters include PEEP, Pmean, PIP, Pplat, PEF, PIF, MVe, MVi, TVe, TVi, RR, I:E, FEV1.0, Compl, RSBI, NIF, WOB, RAW.

rSO_2

Patient	Adult/Pediatric/Neonate.
Method	INVOS, NIRS (Near Infrared Spectroscopy)
Number	Up to 4 channels
Measurement Range	15 to 95 %

NMT

Meet the standard of IEC 60601-2-10

Sensor Type	Acceleromyography sensor
Stimulation Modes	ST, TOF, PTC, DBS3.2, DBS3.3
Stimulation Current Range	
	0 to 60 mA
Stimulation Current Accuracy	
	± 5% or ±2 mA, whichever is greater.
Stimulation Pulse Width	100,200 or 300μs,monophasic rectangle pulse
Stimulation Pulse Width Accuracy	
	± 10 %
Max. Output Voltage	300 V

BISx/BISx4

Meet standard of IEC 60601-2-26.

Method	Bispectral Index
Impedance Range	0 to 999 kΩ
EEG Bandwidth	0.25 to 100 Hz
BIS Range	0 to 100 (BIS, BIS L, BIS R)
SQI Range	0 to 100 % (SQI, SQI L, SQI R)
ASYM	0 to 100%
DSA Trend	Yes

EEG/aEEG

Meet standard of IEC 60601-2-26.

EEG Channels	Up to 4 channels
Montage Mode	Biopolar mode, referential mode
Input Signal Range	- 2 mVp-p to + 2mVp-p
Max. Input DC Offset	± 500 mV
CMRR	≥ 100 dB @51 kΩ imbalance and 60 Hz
Noise Level	≤ 0.5 μV rms (0.5 Hz to 70 Hz)
Differential Input Impedance	
	> 15 MΩ @10 Hz
Electrode Impedance	
Range	1 to 90 kΩ
Accurancy	± 1 kΩ or ± 10%, whichever is greater
Sampling Frequency	EBN EEG: 1024 Hz
	Mindray EEG: 256Hz
Analog bandwidth	EBN EEG: 0.5 to 110 Hz
	Mindray EEG/aEEG: 0.1 to 110 Hz
Spectrum analysis	SEF, MF, PPF, TP, SR, EMG, Delta, Theta, Alpha, Beda
Trend	DSA, CSA

ANI

Patient	Adult, Pediatric (over 12 years old)
Measurement Range	ANIi: 12 to100
	ANIm: 12 to 100
	Energy: 0.00 to 65.54

tcGas

Interfaces with TCM CombiM, TCM TOSCA or SenTec SDM monitor.

Measurement Range	
$tcpCO_2$	5 to 200 mmHg
$tcpO_2$	0 to 800 mmHg
SpO2	0 to 100 %
PR	25 to 240 bpm
Power	0 to 1000 mW
Accuracy	
$tcpCO_2$	TOSCA Sensor 92, tc Sensor 54:
	Better than 1 mmHg (1 % or 10 % CO_2)
	Better than 3 mmHg (33 % CO_2)
	tc Sensor 84:
	Better than 1 mmHg (1 % or 10 % CO_2)
	Better than 5 mmHg (33 % CO_2)
$tcpO_2$	tc Sensor 84:
	Better than 1 mmHg (0 % O_2)
	Better than 3 mmHg (21 % O_2)
	Better than 5 mmHg (50 % O_2)
	Better than 25 mmHg (90 % O_2)
SpO_2	±3 % (70 to 100 %)
PR	±3 bpm
Power	±20 % of reading

iView

CPU	Intel Pentium N4200 2.5GHz
Memory	8 GB
Hard-disk	mSATA SSD 128GB
OS	Windows 10

Recorder

Type	Thermal array
Speed	25 mm/sec, 50 mm/sec
Trace	Up to 3 (paper 50 mm width, 20 m length)

Supports two-slots recorder module.

Alarms

Audible indicator	Yes, 4 different alarm tones, and prompt tone
Visible indicator	Red/yellow/cyan LED, and alarm message

Provide AlarmSight infographic alarm indicator.
Support iAlarm features (alarm limits recommendations, etc.)
Support iStatus combined alarms

Data Storage

Trends Data	> 120 hrs @ 1min, 4 hrs @ 5 sec.
Events	1000 events, including parameter alarms, arrhythmia events, technical alarms, and so on.
NIBP	1000 sets
Interpretation of resting	12-lead ECG results 20 sets
Full disclosure	48 hours for all parameters and waveforms (8G storage card) 48 hours at maximum. The specific storage time depends on the waveforms stored and the number of stored waveforms. (2G storage card)
OxyCRG	48 hrs
ST review	120 hrs @1 min
Minitrend	Yes

Special Functions

Clinical Assistive Application (CAA):
HemoSight™, ST Graphic™, SepsisSight™, BoA Dashboard™, EWS, GCS, ECG 24h Summary, Pace View, AF Summary, NeuroSight
Support calculations (drug, hemodynamic, Oxygenation, Ventilation, Renal), and Titration table.
Support wireless connection with BeneVision TM80 and BP10.
Support nView remote display tool

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
Channel Spacing	5 MHz @ 2.4 GHz (802.11 b/g/n) 20 MHz @ 5 GHz (802.11 a/n)
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
Data Security	WPA-PSK, WPA2-PSK, WPA-Enterprise, WPA2-Enterprise (EAP-FAST, EAP-TLS, EAP-TTLS, PEAP-GTC, PEAP-MSCHAPv2, PEAP-TLS, LEAP) Encryption: TKIP and AES

Output

Auxiliary Output

Standard	Meets the requirements of ANSI/AAMI/IEC 60601-1 for short-circuit protection and leakage current

ECG Analog Output
Bandwidth (- 3 dB; reference frequency: 10 Hz)

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

QRS Delay	≤ 25 ms (in diagnostic mode, and non-paced)
Sensitivity	1 V/mV, ± 5 %

Pace Enhancement

Signal Amplitude:	Voh ≥ 2.5 V
Pulse Width:	10 ms ± 5 %
Signal Rising and Falling Time:	≤ 100 µs

IBP Analog Output
Bandwidth (- 3 dB; reference frequency: 10 Hz)
0 to 40 Hz

Max. Transmission Delay	30 ms
Sensitivity	1 V/100 mmHg, ± 5 %

Interfacing

Main Unit
1 AC Power Connector
2 RJ45 Network Connector, 100 Base-TX, IEEE 802.3
6 USB 2.0 Connector
3 Nonstandard USB SMR Connector
1 VP Connector, VP1 for the secondary display
1 BNC Connector
1 Equipotential Grounding Terminal
Modular iView
1 VP Connector, VP2
4 USB 2.0 Connector
1 RJ45 Network Connector, 100 Base-TX, IEEE 802.3
Multifunction Connector for Defib Sync and Analog Output
1 on multi-parameter module

Barcode Scanner	Support 1D and 2D barcode
Keyboard & Mouse	Support wire and wireless type
Remote Control	Support
Network Printer	Support

Battery

Type	Rechargeable lithium-ion
Number of Battery	1
Capacity	5600mAh
Run Time	> 1 hrs when powered by a new fully-charged battery at 25 °C±5 °C with 12-lead ECG , Resp, SpO2, 4-ch IBP, 2-ch Temp, CO2, C.O. and NIBP measurements every 15 min, WiFi enabled, and screen brightness set to default 5,
Recharge Time	5 hrs to 90% when the monitor is off.

Power Requirements

AC Voltage	100 to 240 VAC (±10 %)
Current	2.8 to1.6 A
Frequency	50 Hz/60 Hz (±3 Hz)

Environmental

Temperature	Operating: 0 to 40 °C (32 to 104 °F) Storage: -20 to 60 °C (-4 to 140 °F)
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)

Safety

Type of Protection	Class I
Degree of Protection	MPM/IBP/C.O./NMT/(a)EEG/PiCCO/ANI module: CF $ScvO_2/CO_2$/AG/ICG/BIS/RM/rSO_2 module: BF
Protection Against Ingress of Fluids	IPX1

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

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