BeneVision N22/N19

Patient monitor

Physical Specifications

Weight	Including main unit with a battery, screen with handle & navigation knob, iView module, and Wi-Fi module.
N22:	11.5 kg (25.4 lbs)
N19:	10.3 kg (22.7 lbs)
Size	Including main unit, screen with handle.
N22:	641 x 383 x 115 mm (portrait) 566 x 458 x 115 mm (landscape)
N19:	584 x 348 x 115 mm (portrait) 509 x 423 x 115 mm (landscape)
Main unit:	268 x 268 x 68 mm

Display

Type	Medical-grade color TFT LCD, capacitive touch screen, support multi-touch operation. Rotatable screen (Landscape and portrait)
Resolution	1680 x 1050 pixels
Screen	
N22:	22-inch, 178° viewing angle
N19:	19-inch, 170° viewing angle
Waveforms	Up to 16 waveforms (portrait) Up to 13 waveforms (landscape)

ECG

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

Lead Sets	Automatic 3/5/6/12 - lead recognition
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
Sweep Speed	6.25 mm/s, 12.5 mm/s, 25 mm/s, 50 mm/s
Gain Selection	x 0.125, x 0.25, x 0.5, x 1, x 2, x 4, auto
Waveform format	Standard, Cabrera

Input Signal Range ± 8 mV (p-p)
Electrode Offset Potential Tolerance ± 500 mV

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
High Freq Cut-off (for 12-lead ECG analysis):	350 Hz, 150 Hz, 35 Hz, 20 Hz selectable
CMRR	
Diagnostic:	> 90 dB
Monitor, Surgical, ST mode:	> 105 dB (with notch filter on)
Pace detection	
Amplitude:	± 2 mV to ± 700 mV
Width:	0.1 to 2 ms
Rise time:	10 to 100 µs (without overshoot)
Defibrillator Protection	Withstand 5000VAC (360J) defibrillation
Defib. Recovery Time	≤ 5 seconds
ESU recovery time	≤ 10 s

Provides Glasgow resting 12-lead ECG algorithm.
Provides Mindray Multi(4)-lead ECG monitoring analysis algorithm.
(* These ECG specifications are from MPM Platinum module.)

Heart Rate

Measurement Range	
Adult:	15 to 300 bpm
Pediatric/Neonate:	15 to 350 bpm
Accuracy	± 1 bpm or ± 1%, whichever is greater.
Resolution	1 bpm

Arrhythmia Analysis

Patient	Adult/Pediatric/Neonate.
Monitored Arrhythmias	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. SVT, SVTs/min

ST Segment Analysis

Patient	Adult/Pediatric.
Range	- 2.0 to + 2.0 mV (RTI)
Accuracy	± 0.02 mV or ± 10%, whichever is greater (- 0.8 to + 0.8 mV)
Resolution	0.01 mV

QT Analysis

Patient	Adult/Pediatric/Neonate.
Parameters	QT, QTc, ΔQTc
QTc Formula	Bazett, Fridericia, Framingham, or Hodges
Range	
QT/QTc:	200 to 800 ms
QT-HR:	Adult: 15 to 150 bpm Pediatric/Neonate: 15 to 180 bpm
QT Accuracy	± 30 ms
Resolution	QT 4 ms; QTc 1 ms

Respiration

Range	0 to 200 bpm
Resolution	1 rpm
Apnea Alarm Time	10, 15, 20, 25, 30, 35, 40 sec
Accuracy	
0 - 120 rpm:	± 1 rpm
121 - 200 rpm:	± 2 rpm
Lead	I, II, or auto (default: lead II)

Pulse Oximetry

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 (0 to 69%)
Perfusion indicator (PI)	Yes, for Mindray/Masimo SpO_2
Pitch Tone	Yes
Dual-SpO_2	Yes, SpO_2, SpO_2b, ΔSpO_2
Pulse Rate Range	
Mindray/Nellcor:	20 to 300 bpm
Masimo:	25 to 240 bpm
Pulse Rate Accuracy	
Mindray:	± 3 bpm (20 - 300 bpm)
Nellcor:	± 3 bpm (20 - 250 bpm)
Masimo:	± 3 bpm (non-motion) ± 5 bpm (motion)
PR Refresh Rate	1 sec

Patented CPR Quality (CQI) is optional with Mindray SpO2 monitoring.

Temperature

Meet standard of ISO 80601-2-56.

Method	Thermal resistance
Channels	Up to 8 channels
Units of Measure	Selectable °C or °F
Range	0 to 50 °C / 32 to 122 °F
Resolution	0.1 °C, 0.1°F
Accuracy	± 0.1 °C or ± 0.2 °F (without probe)
Refresh Rate	1 sec

Raiing iThermometer® Wireless Temp Patch

Units of Measure	Selectable °C or °F
Range	25 to 45 °C / 77 to 113 °F
Resolution	0.1 °C, ± 0.2°F
Accuracy	± 0.1 °C or ± 0.2 °F
Min. Time for accurate measurement	<150 sec under rapid temperature change
Recovery Time	<15 sec (after defibrillation)

TrueTymp™ Tympanic Thermometer

Units of Measure	Selectable °C or °F
Range	33 to 42 °C / 91.4 to 107.6 °F
Resolution	0.1 °C, 0.1°F
Accuracy (without probe cover)	± 0.1 °C (environment temperature 16 to 40 °C, target temperature 35 to 42 °C) ± 0.2 °C (environment temperature 16 to 40 °C, target temperature 33 to 35 °C (not included)) ± 0.2 °C (environment temperature 10 to 16 °C (not included))
Measurement Time	≤ 2 sec

Non-Invasive Blood Pressure

Meet standards of ISO 80601-2-30.

Method	Oscillometry

Modes	Manual, Auto, STAT, Sequence
Units of Measure	mmHg, kPa (user-selectable)
Resolution	1 mmHg
Systolic range	
Adult:	25 to 290 mmHg
Pediatric:	25 to 240 mmHg
Neonate:	25 to 140 mmHg
Diastolic range	
Adult:	10 to 250 mmHg
Pediatric:	10 to 200 mmHg
Neonate:	10 to 115 mmHg
Mean range	
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

FloTrac

CCO Range	1.0 to 20.0 L/min
CCO Reproducibility	± 6% or 0.1L/min, whichever is greater
CCI Range	0.0 to 20.0 L/min/m^2
SV Range	0 to 300 ml
SVI Range	0 to 200 ml/m^2
SVV/PPV Range	0 to 99%
SVR Range	0 to 5000 DS/cm^5
SVRI Range	0 to 9950 DS-m^2/cm^5
ftArt Range	0 to 300 mmHg
ftArt Accuracy	± 4 mmHg or ± 4 %, whichever is greater
PR Range	0 to 220 bpm
PR Accuracy	A_{rms} ≤ 3 bpm

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

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, CPR Dashboard in Resus Mode
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.

www.mindray.com

Supplied by:
Mindray Australia
Unit 3, 24 Gardiner Road, Notting Hill VIC 3168 Australia PH: 1800 793 011

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