

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, Vrrhythm, 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.

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 ₂ b, 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

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

Genius™ 2 Tympanic Thermometer

Measurement Range	33 to 42 °C / 91.4 to 107.6 °F
Calibrated Accuracy	± 0.1 °C (environment temperature 25 °C, target temperature 36.7 to 38.9 °C) ± 0.2 °C (environment temperature 16 °C, target temperature 33 to 42 °C)
Resolution	0.1 °C, 0.1 °F
Response 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

Mean range	Neonate: 10 to 115 mmHg 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 $\pm 3\%$, 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 $\pm 2\%$, whichever is greater (excluding sensor error)
Sensitivity	5 μ V/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 $\pm 1\%$, 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 $\pm 5\%$, whichever is greater
TB Range	23 to 43 $^{\circ}$ C / 73.4 to 109.4 $^{\circ}$ F
TB, TI Accuracy	± 0.1 $^{\circ}$ C (without sensor)
TB, TI Resolution	0.1 $^{\circ}$ C

PICCO

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

(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 $^{\circ}$ C / 73.4 to 109.4 $^{\circ}$ F
TB, TI Accuracy	± 0.1 $^{\circ}$ C (without sensor)
TB, TI Resolution	0.1 $^{\circ}$ C
pArt/pCVP Range	-50 to 300 mmHg
pArt/pCVP Accuracy	± 1 mmHg or $\pm 2\%$, whichever is greater

ScvO₂

Range	0 to 99 %
Accuracy	$\pm 3\%$ (50 to 80 %)

ICG

Method	Thoracic electrical bioimpedance (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, PVRI, PVRI, LCW, LCWI, LVSW, LVSWI, STR, VEPT

Continuous Cardiac Output Interface

Measured Parameter	Consistent with CCO-related parameters outputted by Vigilance II [®] , Vigileo [™] , or EV1000
Vigilance II:	CCO, CCI, C.O., C.I., SV, SVI, SVR, SVRI, RVEF, EDV, EDVI, ESV, ESVI, TB, SaO ₂ , VO ₂ , O ₂ El, DO ₂ , ScvO ₂ , SQI
Vigileo:	CCO, CCI, SV, SVI, SVR, SVRI, ScvO ₂ , SvO ₂
EV1000:	CCO, CCI, CO, CI, SV, SVI, SVV, SVR, SVRI, GEF, CFI, GEDV, ITBV, ITBI, EVLW, EVWI, PVPI

Artema Sidestream CO₂

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:	± 2 mmHg
41 to 76 mmHg:	$\pm 5\%$ of reading
77 to 99 mmHg:	$\pm 10\%$ of reading
100 to 150 mmHg:	$\pm (3 \text{ mmHg} + 8\% \text{ of reading})$

O₂ Accuracy

0 to 25 %:	$\pm 1\%$
25.1 to 80 %:	$\pm 2\%$
80.1 to 100 %:	$\pm 3\%$

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 $\pm 15\%$, 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 VCO₂, VO₂, MVCO₂, MVO₂, EE, RQ parameters, when monitoring with RM module.

Oridion Microstream CO₂

Measurement Range	0 to 99 mmHg
Resolution	1 mmHg

Accuracy

0 to 38 mmHg:	± 2 mmHg
39 to 99 mmHg:	$\pm 5\% + 0.08\%$ 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 CO₂

Measurement Range	0 to 150 mmHg
Resolution	1 mmHg

Accuracy

0 to 40 mmHg:	± 2 mmHg
41 to 70 mmHg:	$\pm 5\%$ of reading
71 to 100 mmHg:	$\pm 8\%$ of reading
101 to 150 mmHg:	$\pm 10\%$ of reading

Rise time

< 60 msec

awRR Range

0 to 150 rpm

awRR Accuracy

± 1 rpm

Provide VCO₂, MVCO₂, FeCO₂, SlopeCO₂, Vtalv, MVtalv, Vd_{aw}, Vd_{alv}, Vd_{alv}/Vt, Vd_{ph}, Vd_{alv}/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 $\pm 10\%$, 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 ₂ O:	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 ₂ O:	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 ₂ O:	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 ₂ O:	≤ 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 ₂ O:	≤ 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 ₂ O:	≤ 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 ₂ O:	≤ 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 ₂ O
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 ₂ O
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.

rSO₂

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)
SQL Range	0 to 100 % (SQL, SQL L, SQL R)
ASYM	0 to 100%
DSA Trend	Yes

EEG

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 (1 Hz to 30 Hz)
Differential Input Impedance	> 15 MΩ @10 Hz

Electrode Impedance

Range	0 to 90 kΩ
Accuracy	± 1 kΩ or ± 10%, whichever is greater
Sampling Frequency	1024 Hz
Analog bandwidth	0.5 to 110 Hz
Spectrum analysis	SEF, MF, PPF, TF, Delta, Theta, Alpha, and Beda
Trend	DSA, CSA

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
SpO ₂	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, 3 different alarm tones, and prompt tone
Visible indicator	Red/yellow/cyan LED, and alarm message

Provide AlarmSight infographic alarm indicator.

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, 24hrs ECG Summary, Pace View
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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

MPAN Communications

Modulation Mode	GFSK
Operating Frequency	2402 to 2480 MHz
Channel Spacing	2 MHz
Wireless Baud Rate	1 Mbps
Output Power	≤ 2.5 mW
Data Security	Private protocol

MPAN is used in device pairing for BeneVision TM80, BP10 NIBP module and BeneVision N series patient monitor.

Output

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

Multifunction Connector for Defib Sync and Analog Output

- 1 on multi-parameter module
- Support 1D and 2D barcode

Barcode Scanner	Support wire and wireless type
Keyboard & Mouse	Support
Remote Control	Support
Network Printer	Support

Battery

Type	Rechargeable lithium-ion
Number of Battery	1
Capacity	5600mAh, 113 VDC
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, 5 hrs to 90% when the monitor is off.
Recharge Time	

Power Requirements

AC Voltage	100 to 240 VAC (±10 %)
Current	2.8 to 1.6 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/EEG module: CF ScvO ₂ /CO ₂ /AG/BIS/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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