

BeneVision N17/N15/N12

Patient monitor



Physical Specifications

Weight	Standard configuration, excluding modules, recorder, battery and accessories.
N17:	7.3 kg (16.1 lbs)
N15:	5.4 kg (11.9 lbs)
N12:	4.1 kg (9.1 lbs)
Size	
N17:	466 x 355 x 210 mm
N15:	396 x 313 x 193 mm
N12:	313 x 290 x 161 mm
Display	
Type	Medical-grade color TFT LCD, capacitive touch screen, support multi-touch operation. 178° viewing angle
Screen & Resolution	
N17:	18.5-inch, 1920 x 1080 pixels (FHD)
N15:	15.6-inch, 1920 x 1080 pixels (FHD)
N12:	12.1-inch, 1280 x 800 pixels (WXGA)
Waveforms	N17: Up to 12 waveforms N15: Up to 10 waveforms N12: Up to 8 waveforms

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 derived 12-lead ECG monitoring.

Provides Mindray Multi(4)-lead ECG monitoring analysis algorithm.

Provides Mindray CrozFusion 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, SVT, SVCs/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 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
Patented CPR Quality (CQI) is optional with Mindray SpO ₂ 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)
TrueTym™ 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	± 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 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, 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 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:	± 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 CO₂	
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 CO₂	
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
 CO₂: 0 to 30 %
 N₂O: 0 to 100 %
 Des/Sev/Enf/Iso/Hal:
 0 to 30 %
 O₂: 0 to 100 %
 awRR: 2 to 100 rpm

Resolution
 CO₂: 0.1 %
 N₂O: 1 %
 Des/Sev/Enf/Iso/Hal:
 0.1 %
 O₂: 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 %
Sev:	> 18 %	Not specified
	0 to 1 %	± 0.15 %
	1 to 5 %	± 0.2 %
	5 to 8 %	± 0.4 %
Enf/Iso/Hal:	> 8 %	Not specified
	0 to 1 %	± 0.15 %
	1 to 5 %	± 0.2 %
O ₂ :	> 5 %	Not specified
	0 to 25 %	± 1 %
	25 to 80 %	± 2 %
awRR:	80 to 100 %	± 3 %
	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,
 CO₂/ N₂O: ≤ 250 ms
 Iso/Hal/Sev/Des: ≤ 300 ms
 Enf: ≤ 350 ms
 O₂: ≤ 600 ms
 Sampling flow 200ml/min, using DRYLINE II™ watertrap and an adult 2.5m sampling line:
 CO₂/ N₂O: ≤ 250 ms
 Iso/Hal/Sev/Des: ≤ 300 ms
 Enf: ≤ 350 ms
 O₂: ≤ 500 ms

Sampling Delay Time
 Sampling flow 120 ml/min, using the DRYLINE II™ watertrap and a neonatal 2.5m sampling line,
 CO₂: ≤ 4 sec
 N₂O: ≤ 4.2 sec
 O₂: ≤ 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:
 CO₂: ≤ 4.2 sec
 N₂O: ≤ 4.3 sec
 O₂: ≤ 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 cmH₂O
 MVe/MVi Adult/Pediatric: 2 to 60 L/min
 Infant: 0.5 to 15 L/min
 TVe/TVi Adult/Pediatric: 100 to 1500 ml

awRR range Infant: 20 to 500 ml
 4 to 120 rpm
 Resolution
 Flow 0.1 L/min
 Paw 0.1 cmH₂O
 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)
 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 Bipolar 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
 Accuracy ± 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, Beta
 Trend DSA, CSA

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

tcGas
 Interfaces with TCM CombiM, TCM TOSCA or SenTec SDM monitor.
 Measurement Range
 tcpCO₂ 5 to 200 mmHg
 tcpO₂ 0 to 800 mmHg
 SpO₂ 0 to 100 %
 PR 25 to 240 bpm
 Power 0 to 1000 mW
 Accuracy
 tcpCO₂ 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) 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)
tcpO ₂	
SpO ₂	±3 % (70 to 100 %)
PR	±3 bpm
Power	±20 % of reading

iView (for N17 only)

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 integrated 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 at maximum. The specific storage time depends on the waveforms stored and the number of stored waveforms.
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:	V _{oh} ≥ 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

AC Power Connector	1
RJ45 Network Connector, 100 Base-TX, IEEE 802.3	
N17:	2 (1 for iView)
N15/N12:	1
USB 2.0 Connector	
N17:	8 (4 for iView)
N15/N12:	4
Nonstandard USB SMR Connector	
N17/N5:	1 to connect SMR, N1/T1 docking station
N12:	1 to connect N1/T1 docking station
Standard DVI-D Video Interface Connector	
N17:	2 (1 for iView)
N15/N12:	1
BNC Connector	1
Equipotential Grounding Terminal	1
Multifunction Connector for Defib Sync and Analog Output	1 on multi-parameter module

Module Slot

N17/N15:	6 slots
N12:	4 slots
Barcode Scanner	Support 1D and 2D barcode
Keyboard & Mouse	Support wire and wireless type via USB
Remote Control	Support
Network Printer	Support

Battery

Type	Rechargeable lithium-ion
Number of Battery	1
Capacity	4500mAh
Run Time	when powered by a new fully-charged battery at 25 °C±5 °C with 5-lead ECG , SpO ₂ , and auto NIBP measurements every 15 min, and screen brightness set to 1.
N17/N15:	> 2 hrs
N12:	> 4 hrs
Recharge Time	4.5 hrs to 90% when the monitor is off.

Power Requirements

AC Voltage	100 to 240 VAC (±10 %)
Current	2.0 to 0.9 A
Frequency	50 Hz/60 Hz (±3 Hz)

Environmental requirements

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

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mindray
healthcare within reach