

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 2.1.43.1. **Medical-grade color TFT LCD, capacitive touch screen, support multi-touch operation.** 178° viewing angle. 2.1.43.3.

Screen & Resolution

2.1.43.2. 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 2.1.43.3. 2.1.51.6.
N15: Up to 10 waveforms
N12: Up to 8 waveforms

ECG

Meet standards of IEC 60601-2-27 and IEC 60601-2-25. 2.1.55.1.

Lead Sets Automatic 3/5/6/12 - lead recognition

3-lead:	I, II, III
2.1.52.1. 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 2.1.53.1.

Defib. Recovery Time ≤ 5 seconds

ESU recovery time ≤ 10 s 2.1.53.2.

Provides Glasgow resting 12-lead ECG algorithm.

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

(* These ECG specifications are from MPM Platinum module.)

2.1.51.3. Heart Rate

Measurement Range

Adult:	15 to 300 bpm
Pediatric/Neonate:	15 to 350 bpm

2.1.52.2. Accuracy	± 1 bpm or ± 1%, whichever is greater.
Resolution	1 bpm

2.1.52.4. Arrhythmia Analysis

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

2.1.44.2. ST Segment Analysis

2.1.52.3. Patient Range	Adult/Pediatric.	2.1.54.1.
Accuracy	- 2.0 to + 2.0 mV (RTI)	
	± 0.02 mV or ± 10%, whichever is greater (- 0.8 to + 0.8 mV)	
Resolution	0.01 mV	

QT Analysis

Patient Parameters Adult/Pediatric/Neonate. 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 2.1.55.3.

2.1.55.2. 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 SpO₂

Pitch Tone Yes

Dual-SpO₂ Yes, SpO₂, SpO₂b, ΔSpO₂

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™ 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. 2.1.54.2.

Method Oscillometry

Modes Manual, Auto, STAT, Sequence 2.1.54.3

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

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)

2.1.51.7. **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

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.	

2.1.56.1

Measurement Range	-50 to 360 mmHg
Resolution	1 mmHg
Accuracy	± 1 mmHg or ± 2 %, whichever is greater (excluding sensor error)

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

2.1.56.2. **Accuracy**

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

ScvO₂	
Range	0 to 99 %
Accuracy	± 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, SVRI, 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 %
CO₂ 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)
O₂ Accuracy	
0 to 25 %:	± 1 %

Capnostat 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	
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.

awRR:	Infant: ±10% or ±6 ml, whichever is greater. ±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	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
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	ANli: 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	
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) ±3 % (70 to 100 %)
SpO ₂	±3 %
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.	

2.1.52.4. 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	

2.1.47.1. Data Storage

Trends Data > 120 hrs @ 1 min, 4 hrs @ 5 sec.

2.1.47.3. 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

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)
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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
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Output Power	< 20dBm (CE requirement: detection mode- RMS) < 30dBm (FCC requirement, detection mode- peak power)
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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
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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)
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Sensitivity	1 V/mV, ± 5 %
Pace Enhancement	
Signal Amplitude:	$V_{oh} \geq 2.5 V$
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
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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)	8 (4 skirtos iView)
N15/N12:	4	

2.1.45.1.

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

BNC Connector	1
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Equipotential Grounding Terminal

Equipotential Grounding Terminal	1
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Multifunction Connector for Defib Sync and Analog Output

Multifunction Connector for Defib Sync and Analog Output	1 on multi-parameter module
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Module Slot

N17/N15:	6 slots
N12:	4 slots

Barcode Scanner

Barcode Scanner	Support 1D and 2D barcode
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Keyboard & Mouse

Keyboard & Mouse	Support wire and wireless type via USB
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Remote Control

Remote Control	Support
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Network Printer

Network Printer	Support
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Battery

Type	Rechargeable lithium-ion
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Number of Battery 1

Number of Battery 1	4500mAh
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Capacity

Capacity	when powered by a new fully-charged battery at 25 °C±5 °C with 5-lead ECG, SpO2, and auto NIBP measurements every 15 min, and screen brightness set to 1.
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Run Time

Run Time	4.5 hrs to 90% when the monitor is off.
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2.1.42.2.

N17/N15:	> 2 hrs
N12:	> 4 hrs

2.1.42.1.

Recharge Time

Recharge Time	4.5 hrs to 90% when the monitor is off.
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Power Requirements

AC Voltage	100 to 240 VAC (±10 %)
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Current

Current	2.0 to 0.9 A
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Frequency

Frequency	50 Hz/60 Hz (±3 Hz)
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Environmental requirements

Temperature	Operating: 0 to 40 °C (32 to 104 °F)
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	Storage: -20 to 60 °C (-4 to 140 °F)
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Humidity	Operating: 15 to 95 % (non condensing)
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	Storage: 10 to 95 % (non condensing)
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Barometric	Operating: 427.5 to 805.5 mmHg (57.0 to 107.4 kPa)
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	Storage: 120 to 805.5 mmHg (16.0 to 107.4 kPa)
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Safety

Type of Protection Class I

Degree of Protection	MPM/IBP/C.O./NMT/(a)EEG/PiCCO/ANI module: CF
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	ScvO ₂ /CO ₂ /AG/ICG/BIS/RM/rSO ₂ module: BF
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Protection Against Ingress of Fluids

Protection Against Ingress of Fluids	IPX1
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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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