

# 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
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### 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
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### 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

Resolution	± 30 ms
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### 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 <sub>2</sub>
Pitch Tone	Yes
Dual-SpO <sub>2</sub>	Yes, SpO <sub>2</sub> , SpO <sub>2</sub> b, ΔSpO <sub>2</sub>
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
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

#### ScvO<sub>2</sub>

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, PVR, 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 <sub>2</sub> , VO <sub>2</sub> , O <sub>2</sub> El, DO <sub>2</sub> , ScvO <sub>2</sub> , SvO <sub>2</sub> , SQI
Vigileo:	CCO, CCI, SV, SVI, SVR, SVRI, ScvO <sub>2</sub> , SvO <sub>2</sub>
EV1000:	CCO, CCI, CO, CI, SV, SVI, SVV, SVR, SVRI, GEF, CFI, GEDV, ITBV, ITBI, EVLW, EVWI, PVPI

#### Artema Sidestream CO<sub>2</sub>

Meet standard of ISO 80601-2-55.

Measurement Range	
etCO <sub>2</sub> :	0 to 150 mmHg
O <sub>2</sub> (optional) :	0 to 100 %
CO <sub>2</sub> 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 <sub>2</sub> Accuracy	
0 to 25 %:	± 1 %
25.1 to 80 %:	± 2 %
80.1 to 100 %:	± 3 %
Resolution	
etCO <sub>2</sub> :	1 mmHg
O <sub>2</sub> (optional) :	1 %
Sample Flow Rate	
Adult/Pediatric:	120 ml/min (with or without O <sub>2</sub> monitoring)
Neonate:	70 ml/min or 90 ml/min, selectable
	90 ml/min (with O <sub>2</sub> 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 watertap and 2.5-meter neonatal sampling line, or an adult watertap and a 2.5-meter adult sampling line:	
Rise Time	

etCO <sub>2</sub> :	≤ 250 ms @ 70 ml/min (Neonate watertap) ≤ 250 ms @ 90 ml/min (Neonate watertap) ≤ 300 ms @ 120 ml/min (Adult watertap)
O <sub>2</sub> (optional) :	≤ 800 ms @ 90 ml/min (Neonate watertap) ≤ 750 ms @ 120 ml/min (Adult watertap)

Sampling Delay Time	
etCO <sub>2</sub> :	≤ 5.0 sec @ 70 ml/min (Neonate watertap) ≤ 4.5 sec @ 90 ml/min (Neonate watertap) ≤ 5.0 sec @ 120 ml/min (Adult watertap)
O <sub>2</sub> (optional) :	≤ 4.5 sec @ 90 ml/min (Neonate watertap) ≤ 5.0 sec @ 120 ml/min (Adult watertap)

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 <sub>2</sub> , VO <sub>2</sub> , MVCO <sub>2</sub> , MVO <sub>2</sub> , EE, RQ parameters, when monitoring with RM module.	

#### Oridion Microstream CO<sub>2</sub>

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 <sup>-7.5</sup> +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<sub>2</sub>

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 <sub>2</sub> , MVCO <sub>2</sub> , FeCO <sub>2</sub> , SlopeCO <sub>2</sub> , Vtalv, MVValv, Vdaw, Vdawl/Vt, Vdvalv, Vdawl/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 <sub>2</sub> :	0 to 30 %
N <sub>2</sub> O:	0 to 100 %
Des/Sev/Enf/Iso/Hal:	0 to 30 %
O <sub>2</sub> :	0 to 100 %
awRR:	2 to 100 rpm
Resolution	
CO <sub>2</sub> :	0.1 %

Full Accuracy	N <sub>2</sub> O:	1 %	
	Des/Sev/Enf/Iso/Hal:	0.1 %	
	O <sub>2</sub> :	1 %	
	awRR:	1 rpm	
	Gases	Range (%REL)	Accuracy (%ABS)
	CO <sub>2</sub> :	0 to 1 %	± 0.1 %
		1 to 5 %	± 0.2 %
		5 to 7 %	± 0.3 %
		7 to 10 %	± 0.5 %
		> 10 %	Not specified
Rise Time	N <sub>2</sub> 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 %
Sampling Delay Time		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 <sub>2</sub> :	0 to 25 %	± 1 %
		25 to 80 %	± 2 %
		80 to 100 %	± 3 %
	awRR:	2 to 60 rpm	± 1 rpm
		> 60 rpm	Not specified
Sampling flow 120 ml/min, using the DRYLINE II™ watertrap and a neonatal 2.5m sampling line, CO <sub>2</sub> / N <sub>2</sub> O: ≤ 250 ms Iso/Hal/Sev/Des: ≤ 300 ms Enf: ≤ 350 ms O <sub>2</sub> : ≤ 600 ms Sampling flow 200ml/min, using DRYLINE II™ watertrap and an adult 2.5m sampling line: CO <sub>2</sub> / N <sub>2</sub> O: ≤ 250 ms Iso/Hal/Sev/Des: ≤ 300 ms Enf: ≤ 350 ms O <sub>2</sub> : ≤ 500 ms			
Sampling flow 120 ml/min, using the DRYLINE II™ watertrap and a neonatal 2.5m sampling line, CO <sub>2</sub> : ≤ 4 sec N <sub>2</sub> O: ≤ 4.2 sec O <sub>2</sub> : ≤ 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 <sub>2</sub> : ≤ 4.2 sec N <sub>2</sub> O: ≤ 4.3 sec O <sub>2</sub> : ≤ 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.			
<b>RM</b>			
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 <sub>2</sub> 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 <sub>2</sub> 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.	
<b>rSO<sub>2</sub></b>	
Patient	Adult/Pediatric/Neonate.
Method	INVOS, NIRS (Near Infrared Spectroscopy)
Number	Up to 4 channels
Measurement Range	15 to 95 %
<b>NMT</b>	
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
<b>BISx/BISx4</b>	
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
<b>EEG</b>	
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, TP, Delta, Theta, Alpha, and Beda
Trend	DSA, CSA
<b>tcGas</b>	
Interfaces with TCM CombiM, TCM TOSCA or SenTec SDM monitor.	
Measurement Range	
tcpCO <sub>2</sub>	5 to 200 mmHg
tcpO <sub>2</sub>	0 to 800 mmHg
SpO <sub>2</sub>	0 to 100 %
PR	25 to 240 bpm
Power	0 to 1000 mW
Accuracy	
tcpCO <sub>2</sub>	TOSCA Sensor 92, tc Sensor 54: Better than 1 mmHg (1 % or 10 % CO <sub>2</sub> ) Better than 3 mmHg (33 % CO <sub>2</sub> ) tc Sensor 84: Better than 1 mmHg (1 % or 10 % CO <sub>2</sub> ) Better than 5 mmHg (33 % CO <sub>2</sub> ) tc Sensor 84: Better than 1 mmHg (0 % O <sub>2</sub> ) Better than 3 mmHg (21 % O <sub>2</sub> ) Better than 5 mmHg (50 % O <sub>2</sub> ) Better than 25 mmHg (90 % O <sub>2</sub> )
SpO <sub>2</sub>	±3 % (70 to 100 %)
PR	±3 bpm
Power	±20 % of reading
<b>iView (for N17 only)</b>	
CPU	Intel Pentium N4200 2.5GHz
Memory	8 GB
Hard-disk	mSATA SSD 128GB
OS	Windows 10
<b>Recorder</b>	
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.	
<b>Alarms</b>	
Audible indicator	Yes, 3 different alarm tones, and prompt tone
Visible indicator	Red/yellow/cyan LED, and alarm message
Provide AlarmSight infographic alarm indicator.	
<b>Data Storage</b>	
Trends Data	> 120 hrs @ 1 min, 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
<b>Special Functions</b>	
Clinical Assistive Application (CAA):	HemoSight™, ST Graphic™, SepsisSight™, BoA Dashboard™, EWS, GCS, 24hrs ECG Summary, Pace View
Support calculations (drug, hemodynamic, Oxygenation, Ventilation, Renal), and Titration table.	
Support wireless connection with BeneVision TM80 and BP10.	
Support nView remote display tool	
<b>Wi-Fi Communications</b>	
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
<b>MPAN Communications</b>	
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.	
<b>Output</b>	
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 %
<b>Interfacing</b>	
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
<b>Battery</b>	
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 , SpO2, 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.
<b>Power Requirements</b>	
AC Voltage	100 to 240 VAC (±10 %)
Current	2.0 to 0.9 A
Frequency	50 Hz/60 Hz (±3 Hz)
<b>Environmental requirements</b>	
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)
<b>Safety</b>	
Type of Protection	Class I
Degree of Protection	MPM/IBP/C.O./NMT/EEG module: CF ScvO2/CO2/AG/BIS/rSO2 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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