

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	± 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
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

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, 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 ₂ , VO ₂ , O ₂ El, DO ₂ , ScvO ₂ , SvO 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:	± 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 %
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 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:	± 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:	± 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 VCO₂, MVCO₂, FeCO₂, SlopeCO₂, Vtalv, MVtalv, Vdawl, Vdawl, Vdawl/Vt, Vdawl/Vt, Vdphyl, 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

CO₂: 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,

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
Infant: 20 to 500 ml

awRR range 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

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

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 % CO₂)
Better than 3 mmHg (33 % CO₂)

tc Sensor 84:
Better than 1 mmHg (1 % or 10 % CO₂)
Better than 5 mmHg (33 % CO₂)

tcpO₂ tc Sensor 84:
Better than 1 mmHg (0 % O₂)
Better than 3 mmHg (21 % O₂)
Better than 5 mmHg (50 % O₂)
Better than 25 mmHg (90 % O₂)

SpO₂ ±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, 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 @ 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

Special Functions

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

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

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: $V_{oh} \geq 2.5 V$
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

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, 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.

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/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.

www.mindray.com

P/N:ENG- BeneVision N17/N15/N12 Datasheet-210285x4P-20200417
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mindray
healthcare within reach