

BeneVision N12/N15/N17 PATIENT MONITORS

Performance Specifications

Display

Type: Medical-grade color TFT LCD, capacitive touchscreen, support multi-touch operation

Size and 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 (3, 5, 6, 12-lead)

Leads: I, II, III, aVR, aVL, aVF, V1-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

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

Defibrillator Protection: Withstand 5000 VAC/50 Hz voltage in isolation against electrosurgical interference and defibrillation

Recovery Time: ≤ 5 s

CMRR

Diagnostic: > 90 dB

Monitor, Surgical,

ST Mode: > 105 dB (with notch filter on)

ESU Recovery Time: ≤ 10 s

Heart Rate Meter

Measurement Range:

Adult: 15 to 300 bpm

Pediatric/Neonate: 15 to 350 bpm

Accuracy: ± 1 bpm or $\pm 1\%$, whichever is greater

Resolution: 1 bpm

Tall T-wave Rejection: When the test is performed based on Clause 201.12.1.101.17 of ANSI/AAMI/IEC 60601-2-27: 2011, the heart rate calculation is not affected for QRS of 1 mV amplitude and 100 ms duration, T-wave duration of 180 ms and amplitude lower than 1.2 mV, and QT interval of 350 ms.

Pace Pulse

Pulse Indicator: Pace pulses meeting the following conditions are labelled with a PACE marker:

Amplitude: ± 2 to ± 700 mV

Width: 0.1 to 2 ms

Rise Time: 10 to 100 μ s (without overshoot)

Pace Pulse Rejection: When tested in accordance with the ANSI/AAMI/ IEC 60601-2-27: 2011: 201.12.1.101.13, the heart rate meter rejects all pulses meeting the following conditions.

Amplitude: ± 2 to ± 700 mV

Width: 0.1 to 2 ms

Rise Time: 10 to 100 μ s (without overshoot)



Arrhythmia Analysis

Patient: Adult/Pediatric

Monitored Arrhythmias: Asystole, V-Fib/V-Tach, V-Tach, Vent Brady, Extreme Tachy, Extreme Brady, Vent Rhythm, PVCs/min, Pauses/min, Couplet, Bigeminy, Trigeminy, R on T, Run PVCs, PVC, Tachy, Brady, Missed Beats, Pacer Not Pacing, Pacer Not Capture, Multiform PVC, Nonsus V-Tach, Pause, Irr Rhythm, A-Fib, SVT, SVCs/min

ST Segment Analysis

Patient: Adult/Pediatric

Range: -2.0 to +2.0 mV (RTI)

Accuracy: -0.8 to +0.8 mV: ± 0.02 mV or $\pm 10\%$, whichever is greater
 Beyond this range: not specified

Resolution: 0.01 mV

ST Adjust Scale: 40 ms after J points, 60 ms after J point (default), 80 ms after J point and 60/80 ms after J point (80 ms when HR 120 bpm or less; 60 ms when HR above 120 bpm)

ISO Adjust Scale: 4-200 ms before R-Wave (default: 80 ms),
 Step: 4 ms

J Point Adjust Scale: 4-200 ms after R-Wave (default: 48 ms),
 Step: 4 ms

QT Analysis

Patient: Adult/Pediatric/Neonate

Parameters: QT, QTc, Δ QTc

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:

Adult: 0 to 120 bpm

Pediatric/Neonate: 0 to 150 bpm

Resolution: 1 rpm

Apnea Alarm Time: 10, 15, 20, 25, 30, 35, 40 s

Accuracy:

7 - 150 rpm: ± 2 rpm or $\pm 2\%$ (whichever is greater)

0 - 6 rpm: Not specified

Lead: I, II, or auto (default: lead II)

Sweep Speed: 3 mm/s, 6.25 mm/s, 12.5 mm/s, 25 mm/s, 50 mm/s

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Performance Specifications

Pulse Oximetry

With Masimo SET® SpO₂

Range:	1 to 100%
Resolution:	1%
Accuracy:	±2% (70 to 100%, Adult/Pediatric, non- motion) ±3% (70 to 100%, motion) ±3% (70 to 100%, Neonate, non-motion) 0 to 69% unspecified
Dual-SpO ₂ :	Yes, SpO ₂ , SpO ₂ b, ΔSpO ₂
Pulse Rate Range:	25 to 240 bpm
Pulse Rate Accuracy:	±3 bpm (non- motion) ±5 bpm (motion)

With Nellcor SpO₂

Range:	0 to 100%
Resolution:	1%
Accuracy:	±2% (70 to 100%, Adult/Pediatric) ±3% (70 to 100%, Neonate) Unspecified (0 to 69%)
Dual-SpO ₂ :	Yes, SpO ₂ , SpO ₂ b, ΔSpO ₂
Pulse Rate Range:	20 to 300 bpm
Pulse Rate Accuracy:	±3 bpm (20 - 250 bpm) Unspecified (251 - 300 bpm)
Refresh Rate:	1 s

Non-Invasive Blood Pressure

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 s Neonate: 90 s
Assisting Venous Puncture:	Yes
Pulse Rate Range:	30 to 300 bpm
Pulse Rate Accuracy:	±3 bpm or ±3%, whichever is greater

Temperature

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)

IBP

Number:	Up to 8 channels
Measurement Range:	-50 to 300 mmHg
Resolution:	1 mmHg
Accuracy:	±1 mmHg or ±2%, whichever is greater (excluding sensor error)
Zero Offset Range:	±200 mmHg
Excitation:	5 V DC, ±2%
Sensitivity:	5 μV/V/mmHg
Impedance Range:	300 to 3000 Ω
PPV Range:	0 to 50%
PAWP:	Yes
Pulse Rate Range:	25 to 350 bpm
Pulse Rate Accuracy:	±1 bpm or ±1%, whichever is greater

Sidestream CO₂

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: ±5% of reading 77 to 99 mmHg: ±10% of reading 100 to 150 mmHg: ±(3 mmHg + 8% of reading)
Resolution:	etCO ₂ : 1 mmHg
Sample Flow Rate:	Adult/Pediatric: 120 ml/min Neonate: 70 ml/min or 90 ml/min
Sample Flow Rate Tolerance:	±15 ml/min or ±15%, whichever is greater
Warm-up Time:	90 s (maximum), 20 s (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)
Sampling Delay Time:	etCO ₂ : ≤5.0 s @ 70 ml/min (Neonate watertrap) ≤4.5 s @ 90 ml/min (Neonate watertrap) ≤5.0 s @ 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 Alarm Time:	10, 15, 20, 25, 30, 35, 40 s

Anesthesia Gases

Sampling Rate

Adult/Pediatric:	200 ml/min
Neonate:	120 ml/min

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Anesthesia Gases (continued)

Sampling Rate Tolerance: ± 10 ml/min or $\pm 10\%$, whichever is greater
 Sampling Delay Time: < 4 s
 Refresh Rate: 1 s
 Warm-up Time: 45 s 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%	$\pm 0.1\%$
	1 to 5%	$\pm 0.2\%$
	5 to 7%	$\pm 0.3\%$
	7 to 10%	$\pm 0.5\%$
	$> 10\%$	Not specified
N ₂ O:	0 to 20%	$\pm 2\%$
	20 to 100%	$\pm 3\%$
Des:	0 to 1%	$\pm 0.15\%$
	1 to 5%	$\pm 0.2\%$
	5 to 10%	$\pm 0.4\%$
	10 to 15%	$\pm 0.6\%$
	15 to 18%	$\pm 1\%$
	$> 18\%$	Not specified
Sev:	0 to 1%	$\pm 0.15\%$
	1 to 5%	$\pm 0.2\%$
	5 to 8%	$\pm 0.4\%$
	$> 8\%$	Not specified
Enf/Iso/Hal:	0 to 1%	$\pm 0.15\%$
	1 to 5%	$\pm 0.2\%$
	$> 5\%$	Not specified
O ₂ :	0 to 25%	$\pm 1\%$
	25 to 80%	$\pm 2\%$
	80 to 100%	$\pm 3\%$
awRR:	2 to 60 rpm	± 1 rpm
	> 60 rpm	Not specified

Rise Time

Sampling flow 120 ml/min, using the Neonatal 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 the Adult/Pediatric 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 Neonatal DRYLINE II™ watertrap and a Neonatal 2.5m sampling line:

CO ₂ :	≤ 4 s
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N₂O: ≤ 4.2 s

O₂: ≤ 4 s

Enf /Iso/Hal/Sev/Des: ≤ 4.4 s

Sampling flow 200ml/min, using the Adult/Pediatric DRYLINE II™ watertrap and an Adult 2.5m sampling line:

CO₂: ≤ 4.2 s

N₂O: ≤ 4.3 s

O₂: ≤ 4 s

Enf/Iso/Hal/Sev/Des: ≤ 4.5 s

Apnea Alarm Time: 10, 15, 20, 25, 30, 35, 40 s

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 s (typical)

Auto-Zeroing Interval: At start-up, and every 12 hrs thereafter

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 Alarm Time: 10, 15, 20, 25, 30, 35, 40 s

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

Blood Temp Range: 23 to 43°C (73.4 to 109.4°F)

Blood Temp Accuracy: $\pm 0.1^\circ\text{C}$ ($\pm 0.2^\circ\text{F}$) (without sensor)

Blood Temp Resolution: 0.1°C (0.2°F)

Continuous Cardiac Output Interface

Measured Parameter: Consistent with CCO-related parameters outputted by Vigilance II®, Vigileo™, EV1000 or HemoSphere monitor

FloTrac™ Specifications

Standard: Meets the requirements of IEC 60601-2-34: 2011

Measured Parameter Display Range Remark

CCO: 1.0 to 20.0 L/min

Reproducibility¹: $\pm 6\%$ or 0.1 L/min, whichever is greater

CCI: 0.0 to 20.0 L/min/m² /

SV: 0 to 300 mL/b /

SVI: 0 to 200 mL/b/m² /

SVR: 0 to 5000 dyne-s/cm⁵ /

SVRI: 0 to 9950 dyne-s-m²/cm⁵ /

SVV: 0 to 99% /

PPV: 0 to 99% /

Blood pressure

2 Live pressure: -34 to 312 mmHg

MAP/DIA/SYS: 0-300 mmHg

Accuracy: $\pm 4\%$ or ± 4 mm Hg, whichever is greater, from -30 mmHg to 300 mmHg

PR: 0 to 220 bpm Accuracy 3: Arms ≤ 3 bpm

1 Coefficient of variation: measured using electronically generated data.

2 Parameter specifications compliant with IEC 60601-2-34. Testing performed under laboratory conditions.

3 Accuracy tested under laboratory conditions.

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Performance Specifications

ScvO₂

Range:	0 to 99%
Accuracy:	±3% (50 to 80%)

rSO₂

Patient:	Adult/Pediatric/Neonate
Method:	INVOS, NIRS (Near Infrared Spectroscopy)
Number:	Up to 4 channels
Measurement Range:	15 to 95%

BIS

Standard:	Meets the standard of IEC 60601-2-26: 2012
Technique:	Bispectral index
Measured Parameters:	EEG

Calculated Parameters:	BIS, BIS L, BIS R: 0 to 100
	SQI, SQI L, SQI R: 0 to 100%
	EMG, EMG L, EMG R: 0 to 100 dB
	SR, SR L, SR R: 0 to 100%
	SEF, SEF L, SEF R: 0.5 to 30.0 Hz
	TP, TP L, TP R: 40 to 100 dB
	BC, BC L, BC R: 0 to 30
	sBIS L, sBIS R: 0 to 10.0
	sEMG L, sEMG R: 0 to 10.0
	ASYM: 0 to 100%

Impedance Range:	0 to 999 kΩ
Sweep Speed:	6.25 mm/s, 12.5 mm/s, 25 mm/s or 50 mm/s, ±10% error
Input Impedance:	>5 MΩ
Noise (RTI):	<0.3 μV (0.25 to 50 Hz)
Input Signal Range:	±1 mV
EEG Bandwidth:	<0.25 to 100 Hz
Patient Leakage Current:	<10 μA

Alarm Limit

BIS High Range:	(low limit + 5) to 100	Step: 5
BIS Low Range:	0 to (high limit - 5)	Step: 5

NMT

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 300 μs, monophasic rectangle pulse
Stimulation Pulse Width Accuracy:	±10%
Max. Output Voltage:	300 V

EEG

EEG Channels:	Up to 4 channels
Bandwidth:	0.5 to 50 Hz (-3 dB)
Input Signal Range:	-2 mVp-p to +2 mVp-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

Measured Parameters: Measurement Range / Resolution

SEF, MF, PPF:	0.5 to 30 Hz / 0.5 Hz
TP:	40 to 100 dB / 1 dB
SR:	0 to 100% / 1%

Delta, Theta, Alpha, Beta:	0 to 100% / 1%
Alpha/Delta (for EEG-1/aEEG module):	0 to 99 (invalid if Delta is 0%) / 0.1

iView (for N17 only)

CPU:	Intel Pentium N4200 2.5 GHz
Memory:	8 GB
Hard-disk:	mSATA SSD 128 GB
OS:	Windows 10

Recorder

Type:	Thermal array
Speed:	25 mm/s, 50 mm/s
Trace:	Up to 3

Data Storage

Trends Data:	>120 hrs @ 1 min, 4 hrs @ 5 s
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:	Up to 48 hrs
OxyCRG:	48 hrs
ST Review:	120 hrs @1 min

Wi-Fi Communications

Protocol:	IEEE 802.11a/b/g/n
Modulation Mode:	DSSS and OFDM

Operating Frequency

IEEE 802.11b/g/n (2.4G):	
FCC:	2.4 to 2.483 GHz
MIC:	2.4 to 2.495 GHz
IEEE 802.11a/n (5G):	
FCC:	5.15 to 5.35 GHz, 5.725 to 5.82 GHz
MIC:	5.15 to 5.35 GHz
Channel Spacing:	5 MHz @ 2.4 GHz, 20 MHz @ 5 GHz
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:	<30 dBm (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:	AES

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

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Physical Specifications

Auxiliary Output (continued)

IBP Analog Output

Bandwidth (-3 dB; reference frequency: 10 Hz)
0 to 40 Hz
Max. Transmission Delay 30 ms
Sensitivity: 1 V/100 mmHg, $\pm 5\%$

Interfacing

AC Power Connector: 1
RJ45 Network Connector, 100 Base-TX, IEEE 802.3
N17: 1
N15/N12: 1
USB 2.0 Connector:
N17: 4
N15/N12: 4
Nonstandard USB SMR Connector:
N17/N15: 1 to connect SMR, N1/T1 docking station
N12: 1 to connect N1/T1 docking station

Standard DVI-D Video Interface Connector:

N17: 2
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 and Mouse: Support wire and wireless type

Remote Control: Support

Network Printer: Support

Battery

Type: Rechargeable lithium-ion
Number of Battery: 1
Capacity: 4500 mAh, 11.1 VDC
Run Time: When powered by a new fully-charged battery at 25°C $\pm 5^\circ\text{C}$ 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

Physical BeneVision N12

Dimension: 11.4" (H) x 12.3" (W) x 6.3" (D)
29.0 cm (H) x 31.3 cm (W) x 16.1 cm (D)

Weight: 9.0 lb (4.1 kg) standard parameters, excluding modules, recorder, battery, and accessories

Physical BeneVision N15

Dimension: 12.3" (H) x 15.6" (W) x 7.6" (D)
31.3 cm (H) x 39.6 cm (W) x 19.3 cm (D)

Weight: 11.9 lb (5.4 kg) standard parameters, excluding modules, recorder, battery, and accessories

Physical BeneVision N17

Dimension: 14.0" (H) x 18.3" (W) x 8.3" (D)
35.5 cm (H) x 46.6 cm (W) x 21.0 cm (D)

Weight: 16.1 lb (7.3 kg) standard parameters, excluding modules, recorder, battery, and accessories

Environmental

Operating Temperature:

0°C to 40°C Main unit, MPM module, individual module of SpO₂, TEMP, IBP, CO, CCO/SvO₂, NMT, EEG, FloTrac, and BeneLink, recorder
0°C to 40°C Microstream CO₂ module
5°C to 40°C Sidestream CO₂ module
10°C to 40°C AG module, ScvO₂ module
16°C to 32°C rSO₂ module

Storage Temperature:

-20°C to 60°C Main unit, MPM module, individual module of SpO₂, TEMP, IBP, CO, CCO/SvO₂, ScvO₂, NMT, AG, Microstream/Sidestream CO₂, EEG, FloTrac, and BeneLink, recorder
-20°C to 70°C rSO₂ module

Operating Humidity:

15 to 95% (non condensing): Main unit, MPM module, individual module of SpO₂, TEMP, IBP, CO, CCO/SvO₂, NMT, AG, Microstream/Sidestream CO₂, EEG, FloTrac, and BeneLink, recorder

15 to 75% (non condensing): ScvO₂ module

20 to 80% (non condensing): rSO₂ module

Storage Humidity:

10 to 95% (non condensing): Main unit, MPM module, individual module of SpO₂, TEMP, IBP, CO, CCO/SvO₂, ScvO₂, NMT, AG, Microstream/Sidestream CO₂, EEG, FloTrac, and BeneLink, recorder

10 to 90% (non condensing): ScvO₂ module

Operating Atmospheric Pressure:

427.5 to 805.5 mmHg: Main unit, MPM module, individual module of SpO₂, TEMP, IBP, CO, CCO/SvO₂, ScvO₂, NMT, EEG, FloTrac, and BeneLink, recorder

430 to 790 mmHg: Microstream/Sidestream CO₂ module

525 to 805.5 mmHg: AG module

522 to 805.5 mmHg: rSO₂ module

Operating Atmospheric Pressure:

120 to 805.5 mmHg: Main unit, MPM module, individual module of SpO₂, TEMP, IBP, CO, CCO/SvO₂, ScvO₂, NMT, EEG, FloTrac, and BeneLink, recorder

430 to 790 mmHg: Microstream/Sidestream CO₂ module

525 to 805.5 mmHg: AG module

435.7 to 822 mmHg: rSO₂ module

Safety

Type of Protection: Class I

Degree of Protection: MPM/IBP/C.O./NMT/EEG module: CF
ScvO₂/CO₂/AG/rSO₂ module: BF

Protection Against Ingress of Fluids: IPX1

Power Requirements

AC Voltage: 100 to 240 VAC ($\pm 10\%$)

Current: 2.0 to 0.9 A

Frequency: 50 Hz/60 Hz (± 3 Hz)

Fuse: Time-lag 250 VT3.15 A