

BeneView T9/T8/T6/T5

Patient monitor



Physical Specifications

Weight	T9: <12kg(26.4lbs) T8/T6: <9.9kg(21.8lbs) T5: <6.6kg(14.6lbs) (Standard configuration, excluding modules, recorder, batteries and accessories.)
Size	T9: 435×404×202.5 mm (17.1" x 15.9" x 8") T8/T6: 400 x 370 x 193 mm (15.7" x 14.6" x 7.6") T5: 297 x 336 x 186 mm (11.7" x 13.2" x 7.3")
Display screen	Medical-grade color TFT LCD, touch screen T9: 19-inch, 1280 x 1024 pixels T8: 17-inch, 1280 x 1024 pixels T6: 15-inch, 1024 x 768 pixels T5: 12.1-inch, 800 x 600 pixels
Display traces	T9/T8: Up to 12 waveforms T6: Up to 10 waveforms T5: Up to 8 waveforms
External display	1 display through DVI-D connector 2 display through RDD

ECG

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

Lead set	3-lead: I, II, III 5-lead: I, II, III, aVR, aVL, aVF, V 12-lead: I, II, III, aVR, aVL, aVF, V1 to V6 Automatic 3/5/12 - lead recognition.
Input signal range	± 8 mV (p-p)
Electrode offset potential tolerance	± 500 mV
Gain	x 0.125, x 0.25, x 0.5, x 1, x 2, x 4, auto
Sweep speed	6.25 mm/s, 12.5 mm/s, 25 mm/s, 50 mm/s
Waveform format	Standard, Cabrera
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
CMRR	Diagnostic: > 90 dB Monitor, Surgical, ST mode: > 105 dB
Pace detection	Amplitude: ± 2 mV to ± 700 mV Width: 0.1 to 2 ms Rise time: 10 to 100 μs (without overshoot)
Defib. protection	Withstand 5000V (360J) defibrillation
Defib. recovery time	≤5 s
ESU recovery time	≤10 s

Provides Glasgow resting 12-lead ECG algorithm.

Heart Rate

HR range	Adult: 15 to 300 bpm Pediatric/Neonate: 15 to 350 bpm
HR accuracy	± 1 bpm or ± 1%, whichever is greater.
HR resolution	1 bpm

Arrhythmia Analysis

Intended use for adult, pediatric.
Multi-lead, 24 classifications. Asystole, VFib/VTac, Vtac, Vent. Brady, Extreme Tachy, Extreme Brady, Vrrhythm, PVCs/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

Intended use for adult, and pediatric.
ST range - 2.0 to + 2.0 mV

ST range	- 2.0 to + 2.0 mV
ST accuracy	± 0.02 mV or ± 10%, whichever is greater (- 0.8 to + 0.8 mV)
ST resolution	0.01 mV

QT Analysis

Intended use for adult, pediatric, and neonate.

Parameters	QT, QTc, ΔQTc
QTc formula	Bazett, Fridericia, Framingham, or Hodges
QT/QTc range	200 to 800 ms
QT accuracy	± 30 ms
QT resolution	4 ms
QTc resolution	1 ms
QT-HR range	Adult: 15 to 150 bpm Pediatric/Neonate: 15 to 180 bpm

Respiration

Lead	I or II, auto
RR range	0 to 200 rpm
RR Accuracy	± 1 rpm (0 to 120 rpm), ± 2 rpm (121 to 200 rpm)
RR Resolution	1 rpm
Apnea time	10, 15, 20, 25, 30, 35, 40 s
Sweep speed	3mm/s, 6.25mm/s, 12.5mm/s, 25mm/s, 50 mm/s

SpO₂

Meet standards of ISO 80601-2-61.

Range	0 to 100%
Resolution	1%
Mindray accuracy	±2% (70-100%, Adu/Ped, non-motion) ±3% (70-100%, Neo, non-motion) ±3% (70-100%, motion) Unspecified (0-69%)
Masimo accuracy	±2% (70-100%, Adu/Ped, non-motion) ±3% (70-100%, Neo, non-motion) ±3% (70-100%, motion) Unspecified (0-69%)
Nellcor accuracy	Actual accuracy depends on probe. Refer to the operator's manual.
Refreshing rate	1 s
Dual SpO ₂	SpO ₂ , SpO ₂ b, Δ SpO ₂

PR

PR range	20 to 300 bpm (SpO ₂) 25 to 350 bpm (IBP) 30 to 300 bpm (NIBP)
PR accuracy	± 3 bpm (20 to 300 bpm, Mindray SpO ₂) ± 3 bpm (20 to 250 bpm, Nellcor SpO ₂) ±1 bpm or ± 1 %, whichever is greater (IBP) ± 3 bpm or ± 3 %, whichever is greater(NIBP)
Refreshing rate	1 s

Temperature

Meet standard of ISO 80601-2-56.

Technique	Thermal resistance
Channels	Up to 4 channels
Temp range	0 to 50 °C (32 to 122 °F)
Temp accuracy	± 0.1 °C or ± 0.2 °F (without probe)
Temp resolution	0.1 °C
Refreshing rate	1 s

NIBP

Meet standards of ISO 80601-2-30.

Technique	Oscillometry
Operation mode	Manual, Auto, STAT, Sequence
Parameters	Systolic, Diastolic, Mean
Max Measurement time	Adult/Pediatric: 180 s, Neonate: 90 s
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
NIBP accuracy	Max mean error: ± 5 mmHg Max standard deviation: 8 mmHg
NIBP resolution	1 mmHg
Assisting Venous Puncture	Yes

IBP

Meet standard of IEC 60601-2-34.

Channels	Up to 8 channels
Sensitivity	5 μ V/V/mmHg
Impedance range	300 to 3000 Ω
IBP range	-50 to 360 mmHg
IBP accuracy	± 1 mmHg or ± 2 %, whichever is greater
IBP resolution	1 mmHg
PPV range	0 to 50 %
PAWP	Yes
ICP measurement	Support
Support waveforms overlapping.	

C.O.

Technique	Thermodilution
C.O. range	0.1 to 20 L/min
C.O. accuracy	± 0.1 L/min or ± 5 %, whichever is greater
C.O. resolution	0.1 L/min
TB range	23 to 43 °C (73.4 to 109.4 °F)
TI range	0 to 27 °C (32 to 80.6 °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	25 to 45 °C
TB accuracy	± 0.1 °C (without sensor)
TI range	0 to 30 °C
TI accuracy	± 0.1 °C (without sensor)
pArt/pCVP range	-50 to 300 mmHg
pArt/pCVP accuracy	± 1 mmHg or ± 2 %, whichever is greater

ScvO₂

ScvO ₂ range	0 to 99 %
ScvO ₂ accuracy	± 3 % (50 to 80 %)

ICG

Technique	Thoracic electrical bioimpedance (TEB)
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.
HR range	44 to 200 bpm (ICG), accuracy ± 2 bpm
C.O. range	1.0 to 15 L/min
SV range	5 to 250 ml

CCO/SvO₂

Interfaces with Edwards Vigilance II, Vigileo, or EV1000 monitor.
Vigilance II: CCO, CCI, C.O., C.I., SV, SVI, SVR, SVRI, RVEF, EDV, EDVI, ESV, ESVI, TB, SaO₂, VO₂, O₂El, DO₂, ScvO₂, SvO₂, SQL.
Vigileo: CCO, CCI, SV, SVI, SVR, SVRI, ScvO₂, SvO₂.
EV1000: CCO, CCI, C.O., C.I., SV, SVI, GEF, CFI, GEDV, GEDI, ITBV, ITBI, SVV, CVP, SVR, SVRI, MAP, EVLW, EVWI, PVPI, TB., SvO₂, ScvO₂, DO₂, DO₂I, VO₂, VO₂e, VO₂le, SpO₂.

Artema Sidestream CO₂

Meet standard of ISO 80601-2-55.

CO ₂ sample flow rate (PN: 115-037385-00)	120 ml/min (DRYLINE II™ watertrap for adult/pediatric) 90 ml/min (DRYLINE II™ watertrap for neonate)
CO ₂ sample flow rate (PN: 115-020189-00)	Adult: 70, 100, 120, 150 ml/min Pediatric/neonate: 70, 100 ml/min
CO ₂ sample flow rate accuracy	± 15 ml/min or ± 15 %, whichever is greater.
Sweep speed	3 mm/s, 6.25 mm/s, 12.5 mm/s, 25 mm/s, 50 mm/s
CO ₂ range	0 to 99 mmHg
CO ₂ accuracy	± 2 mmHg (0 to 40 mmHg) ± 5 % of the reading (41 to 76 mmHg) ± 10 % of the reading (77 to 99 mmHg)
CO ₂ resolution	1 mmHg
O ₂ range	0 to 100 %
O ₂ accuracy	± 1 % (0 to 25 %) ± 2 % (25.1 to 80 %) ± 3 % (80.1 to 100 %)
O ₂ resolution	0.1 %
awRR range	0 to 150 rpm
awRR accuracy	± 1 rpm (0 to 59 rpm) ± 2 rpm (60 to 150 rpm)
Apnea time	10, 15, 20, 25, 30, 35, 40 s

Oridion Microstream CO₂

Meet standard of ISO 80601-2-55.

Sample flow rate	50 ^{-7.5} ₊₁₅ ml/min
Sweep speed	3 mm/s, 6.25 mm/s, 12.5 mm/s, 25 mm/s, 50 mm/s
CO ₂ range	0 to 99 mmHg
CO ₂ accuracy	± 2 mmHg (0 to 38 mmHg) ± 5 % of the reading (0.08 % increased in error for every 1 mmHg if the reading is more than 38) (39 to 99 mmHg)
awRR range	0 to 150 rpm
awRR accuracy	± 1 rpm (0 to 70 rpm) ± 2 rpm (71 to 120 rpm) ± 3 rpm (121 to 150 rpm)
Apnea time	10, 15, 20, 25, 30, 35, 40 s

Capnostat Mainstream CO₂

Meet standard of ISO 80601-2-55.

Sweep speed	3 mm/s, 6.25 mm/s, 12.5 mm/s, 25 mm/s, 50 mm/s
CO ₂ range	0 to 150 mmHg
CO ₂ accuracy	± 2 mmHg (0 to 40 mmHg)

	±5 % of the reading (41 to 70 mmHg)
	±8 % of the reading (71 to 100 mmHg)
	±10 % of the reading (101 to 150 mmHg)
awRR range	0 to 150 rpm
awRR accuracy	±1 rpm
Apnea time	10, 15, 20, 25, 30, 35, 40 s

Multi-gas

Meet standard of ISO 80601-2-55.

Gas	CO ₂ , O ₂ , N ₂ O, Des, Iso, Enf, Hal, Sev
Warm-up time	ISO accuracy mode: 45 s Full accuracy mode: 10 min
Sample flow rate	Adult/pediatric: 120, 150, 200 ml/min Neonate watertrap: 70, 90, 120 ml/min
Sample flow rate accuracy	±10 ml/min or ±10%, whichever is greater.
CO ₂ range	0 to 30 %
O ₂ range	0 to 100 %
N ₂ O range	0 to 100 %
Enf/Iso/Hal/Sev/Des range	0 to 30 %
awRR range	2 to 100 rpm
awRR accuracy	±1 rpm (2 to 60 rpm)
Apnea time	10,15,20,25,30,35,40 s
Provide MAC value (support calibrated by age).	
Support two mixed gas identify and monitoring.	

BISx/BISx4

Meet standard of IEC 60601-2-26.

Technique	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

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 300 μs, monophasic rectangle pulse
Stimulation pulse width accuracy	± 10 %
Max. output voltage	300 V

EEG

Meet standard of IEC 60601-2-26.

EEG channels	Up to 4 channels
Montage mode	Biopolar mode, referential mode
Max. Input DC offset	± 500 mV DC
CMRR	≥ 100 dB @ 50Hz
Sampling Frequency	1024 Hz
Analog bandwidth	0.5 to 110 Hz
Measurement range	0.5 to 30 Hz
Low filter	0.16 Hz, 0.5 Hz, 1.0 Hz, 2.0 Hz.
High filter	15 Hz, 30 Hz, 50 Hz, 70 Hz.
Spectrum analysis	SEF, MF, PPF, TF, Delta, Theta, Alpha, and Beta
DSA trend	Yes
CSA trend	Yes

RM

Technique	Diff-Pressure flow
Monitoring parameters include	PEEP, Pmean, PIP, Pplat, PEF, PIF, MVe, MVi, Tve, TVi, RR, I:E, FEV1.0, Compl, RSBI, NIF, WOB, RAW, and loops.

Flow range	Adult/Pediatric: ± (2 to 120) L/min Neonate: ± (0.5 to 30) L/min
Flow accuracy	Adult/Pediatric: ± 1.2 L/min or ± 10% of the reading, whichever is greater. Neonate: ± 0.5 L/min or ± 10% of the reading, whichever is greater.
Flow resolution	0.1 L/min
Paw range	-20 to 120 cmH ₂ O
Paw accuracy	± 3% x reading
Paw resolution	0.1 cmH ₂ O
MVe/MVi range	Adult/Pediatric: 2 to 60 L/min Infant: 0.5 to 15 L/min
MVe/MVi accuracy	± 10% x reading
MVe/MVi resolution	0.01 L/min (MVe/MVi < 10 L/min) 0.1 L/min (MVe/MVi ≥ 10 L/min)
Tve/TVi range	Adult/Pediatric: 100 to 1500 ml Infant: 20 to 500 ml
Tve/TVi accuracy	Adult/Pediatric: ±10% or ±15 ml, whichever is greater. Infant: ±10% or ±6 ml, whichever is greater.
Tve/TVi resolution	1 ml
awRR range	4 to 120 rpm
awRR accuracy	±1 rpm (4 to 99 rpm) ±2 rpm (100 to 120 rpm)
awRR resolution	1 rpm
Provide VCO ₂ , VO ₂ , MVCO ₂ , MVO ₂ , EE, RQ parameters, when monitoring with Sidestream CO ₂ or AG module configured with the paramagnetic O ₂ sensor.	

tcGas

Interfaces with TCM CombiM, TCM TOSCA or SenTec SDM monitor.

tcpCO ₂ range	5 to 200 mmHg
tcpCO ₂ accuracy	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 range	0 to 800 mmHg
tcpO ₂ accuracy	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)
SpO ₂ range	0 to 100 %
SpO ₂ accuracy	±3 % (70 to 100 %)
PR range	25 to 240 bpm
PR accuracy	±3 bpm
Power range	0 to 1000 mW
Power accuracy	±20 % of reading

EWS (Early Warning Score)

Scoring System	NEWS, MEWS, IPS with customization Support sending EWS results to CMS.
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Data Review

Trends data	120 hours with resolution no less than 1min. 4 hours with resolution @ 5 sec
Alarm events	100 events and associated waveforms
Arrhythmia events	100 events and associated waveforms
OxyCRG events	100 events and associated trends
NIBP	1000 sets
Interpretation of resting	12-lead ECG results 20 sets
Full disclosure	48 hours at maximum. The specific storage

Minitrend time depends on the waveforms stored and the number of stored waveforms.
Yes

Alarms

Audible indicator Yes, 3 different alarm tones, and prompt tone
Visible indicator Red/yellow/cyan LED, and alarm message

iView

T9 and T8 support iView.

CPU Intel atom N2600 dualcore, 1.6GHz
Memory 2 GB DDR3 800MHz
Hard-disk SSD 128GB
OS Windows 7

Wi-Fi Communications

Protocol IEEE 802.11a/b/g/n
Frequency range 2.4 to 2.483 GHz
5.15 to 5.35 GHz
5.47 to 5.725 GHz
5.725 to 5.82 GHz

Interfacing and I/O devices

Main unit AC power connector (1)
DVI-D port (1)
Network connector (T9/T8/T6: 2, T5: 1),
100 Base-TX, IEEE 802.3
USB 1.1 connector (10)
SMR connector (1)
CF card connector
Nurse call connector (1)
Micro-D port analog output and defibrillator
synchronization signals (1)
Integrated Module slots: 5 slots
Barcode scanner Support 1D barcode, standard USB
Keyboard & Mouse Support wire and wireless type, standard USB
Thermal Recorder 3 traces (paper 50 mm width, 20 m length)
25mm/s, 50 mm/s speed
Network printer Support

Power

Line voltage 100 to 240 VAC (±10 %)
T9/T8/T6: 2.8 to 1.6 A
T5: 2.5 to 1.4 A
Frequency 50/60 Hz
Battery Two rechargeable lithium-ion battery,
4500mAh, 11.1 VDC
T9/T8/T6: > 2 hours run time (typical)
T5: > 5.5 hours run time (typical)
Charge time 5 hours to 90%, 6 hours to 100%

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)

Some of functions marked with an asterisk may not be available. Please contact your local Mindray sales representative for the most current information.