

# VS 9

## Vital Signs Monitor

### DataSheet



#### Physical Specifications

Dimension	275 x 185 x 135 mm
Weight	3.4 kg (with Mindray SpO <sub>2</sub> , NIBP, recorder, and a battery; without accessories.)
Screen	10.1-inch, 1280 x 800 pixels Standard capacitive touchscreen support multi-touch operation

#### TrueBP™ NIBP

Meet standards of ISO 80601-2-30.	
Technique	Oscillometry, support inflation and deflation
Operation mode	Manual, Auto, STAT, Sequence, and BP averaging
Parameters	Systolic, Diastolic, Mean
Typical measurement time	≤ 15 s (Inflation algorithm, with CM1203/CM1303/CM1503 cuff, PR within 60 to 200 bpm and systolic pressure within 80 to 120 mmHg)
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
Accuracy	Max mean error: ± 5 mmHg Max standard deviation: 8 mmHg
NIBP resolution	1 mmHg
Assisting venous puncture	Yes

#### SpO<sub>2</sub>

Meet standards of ISO 80601-2-61.	
Module	Mindray, Masimo, Nellcor
Range	Mindray/Nellcor: 0 to 100% Masimo: 1 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 (1 to 69%)
Perfusion indicator (PI)	Yes, for Mindray/Masimo SpO <sub>2</sub>
Pitch tone	Yes
Refresh rate	≤ 1 s

#### PR

PR range	20 to 300 bpm (from Mindray/Nellcor SpO <sub>2</sub> ) 25 to 240 bpm (from Masimo SpO <sub>2</sub> ) 30 to 300 bpm (from NIBP)
Accuracy	± 3 bpm (20 to 300 bpm, from Mindray SpO <sub>2</sub> ) ± 3 bpm (20 to 250 bpm, from Nellcor SpO <sub>2</sub> )

± 3 bpm (non-motion, from Masimo SpO<sub>2</sub>)  
± 5 bpm (motion, from Masimo SpO<sub>2</sub>)  
± 3 bpm or ± 3 %, whichever is greater  
(from NIBP)

Refreshing rate ≤ 1 s

#### TrueTemp™ Temperature

Meet standard of ISO 80601-2-56.	
Technique	Thermal resistance
Operating mode	Predictive mode, Monitor mode
Temp range	Predictive mode 34 to 42 °C (93.2 to 107.6 °F) Monitor mode 25 to 44 °C (77 to 111.2 °F)
Temp accuracy (Monitor mode)	± 0.1 °C
Temp resolution	0.1 °C
Minimum measurement time for accurate readings	Monitor mode: <60 s Predictive mode (condition: room temperature 24 °C - 26 °C, no motion interference, patient temperature within 37 °C ± 0.2 °C): 4 s - 6 s (oral) 12 s - 15 s (axillary, adult) 10 s - 13 s (axillary, pediatric and neonate) 4 s - 8 s (rectal)

#### TrueTym™ Ear Thermometer

Meet standard of ISO 80601-2-56.	
Measurement range	33.0 °C to 42.0 °C (91.4 °F - 107.6 °F)
Resolution	0.1 °C or °F
Measurement time	≤ 2 s
Accuracy	At a room temperature of 16 °C to 40 °C (61 °F to 104 °F): ± 0.2 °C (± 0.4 °F) in measurement range 35.0 °C to 42.0 °C (95 °F to 107.6 °F) ± 0.3 °C (± 0.5 °F) in measurement range 33.0 °C to 35.0 °C (91.4 °F to 95 °F) (35.0 °C or 95 °F not included). At a room temperature of 10 °C to 16 °C (50 °F to 61 °F) (16 °C or 61 °F not included): ± 0.3 °C (± 0.5 °F)

#### Genius™ 3 Tethered Tympanic Thermometer

Temp range	33.0 to 42.0 °C (91.4 to 107.6 °F)
Temp accuracy	± 0.3 °C
Temp resolution	0.1 °C

#### Exergen TemporalScanner™ Thermometer

Temp range	16.0 to 43.0 °C
Temp accuracy	± 0.2 °C
Temp resolution	0.1 °C

#### TrueResp™ RR (from Mindray SpO<sub>2</sub>)

RR range	4 to 70 rpm
Measurement precision	Arms: ≤ 3rpm, mean difference [-1, 1] rpm
RR resolution	1 rpm
Time for first measurement	≤ 30 s

Refreshing rate ≤ 1 s

#### CO<sub>2</sub>

Meet standard of ISO 80601-2-55.	
Technique	Infrared absorption

Sample flow rate	50ml/min (With Oridion Sampling line)
Sample flow rate accuracy	± 15 ml/min or ± 15 %, whichever is greater.
Response time	≤ 5.0 s With an Oridion standard sampling line ≤ 6.5 s With an Oridion extended sampling line ≤ 5.0 s With a DRYLINE™ PRIME sampling line
Sweep speed	3 mm/s, 6.25 mm/s, 12.5 mm/s, 25 mm/s, 50 mm/s
CO <sub>2</sub> range	0-150 mmHg
CO <sub>2</sub> accuracy	Full accuracy mode: 0 - 40 mmHg: ± 2 mmHg 41 - 76 mmHg: ± 5% of reading 77 - 99 mmHg: ± 10% of reading 100 to 150 mmHg: ± (3mmHg + 8% of reading)
	ISO accuracy mode: Add ± 2 mmHg to the full accuracy mode
CO <sub>2</sub> resolution	1 mmHg
awRR range	0 to 150 rpm
awRR accuracy	± 1 rpm (0 to 59 rpm) ± 2 rpm (60 to 150 rpm)
Apnea time	10 s, 15 s, 20 s, 25 s, 30 s, 35 s, 40 s

### Manual Input

Support up to 30 manual input parameters (customizable)

### Data Review

Trends data

Spot Check mode: Up to 5000 groups

Continuous mode: Up to 240 hours @ 30 seconds

Events Up to 200 events, including parameter alarms, technical alarms, and so on.

### Alarms

Audible indicator Yes, 3 different alarm tones, and prompt tone

Visible indicator Red/yellow/cyan LED, and alarm message display

Provide AlarmSight infographic alarm indicator.

### Clinical Assistive Application (CAA):

EWS (MEWS, NEWS, NEWS2, PEWS), GCS, Pain score, Targeted Goal View, Orthostatic BP Measurement.

### Blue Tooth

Protocol	Bluetooth 5
Modulation mode	GFSK
Operating frequency	2402MHz to 2480MHz
Wireless data rate	2Mbps, 1Mbps, 125kbps
Output power	≤ 8 dBm ± 4 dB
Data security	AES128

### Wi-Fi Communications

Protocol	IEEE 802.11a/b/g/n/ac
Modulation mode	BPSK, QPSK, 16QAM, 64QAM, 256QAM
Operating frequency	2412MHz to 2472MHz 5180MHz to 5320MHz 5500MHz to 5700MHz 5745MHz to 5825MHz

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: MCS0 to MCS7 IEEE 802.11ac: MCS0 to MCS8
Output power	< 20dBm (CE requirement: detection mode- RMS) < 30dBm (FCC requirement: detection mode- peak power)
Operating mode	Infrastructure
Data security	Standard: WPA/WPA2-PSK, WPA/WPA2-Enterprise, WPA/WPA2 CCKM EAP method: LEAP, EAP-TTLS, EAP-TLS, EAP-FAST, PEAP-MSChapV2, PEAP-GTC, PEAP-TLS Encryption: TKIP and AES

### Interfacing

Main unit

AC power connector (1)  
Network connector (1), RJ45  
USB 2.0 connector (2)  
Multi-Functions connect (1)  
Equipotential grounding terminal (1)  
External battery connector (1)  
Support 1D and 2D barcode  
Thermal recorder 3 traces (paper 50 mm width, 20 m length)  
Data output HL7, eGateway, VitalsLink (Cerner™)  
Auth. Management MLDAP, Imprivata™

### Power

Line voltage	100 to 240 VAC (± 10 %)
Current	0.9 to 0.5A
Frequency	50/60 Hz (± 3 Hz)
Battery	5600mAh rechargeable smart Li-ion battery ≥ 8 hours run time
Recharge time (power off)	4 hours to 100%

### Environmental requirements

Temperature	Operating: 0 to 40 °C (without CO <sub>2</sub> ) 5 to 40 °C (with CO <sub>2</sub> ) Storage: -20 to 60 °C
Humidity	Operating: 15 to 95 % (non condensing) Storage: 10 to 95 % (non condensing)
Barometric	Operating: 120 to 805.5 mmHg (57 to 107.4 kPa) (without CO <sub>2</sub> ) 430 to 790 mmHg (57.3 to 105.3 kPa) (with CO <sub>2</sub> ) Storage: 120 to 805.5 mmHg (16 to 107.4 kPa) (without CO <sub>2</sub> ) 430 to 790 mmHg (57.3 to 105.3 kPa) (with CO <sub>2</sub> )

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](http://www.mindray.com)

P/N:ENG-VS 9 Datasheet-210285x2P-20221115

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