

# VS-900

## Vital Signs Monitor



### Physical Specifications

Weight	≤2.5 kg (with SpO <sub>2</sub> , NIBP recorder and a battery.)
Size	178 mm × 150 mm × 260 mm
Display screen	Color TFT LCD 8.4", 800×600 pixels Touch screen (optional)
Display waveform	Up to 2 waveforms, SpO <sub>2</sub> and CO <sub>2</sub>

**Patient Type** Adult, Pediatric, Neonatal

### NIBP

Meet standards of IEC 80601-2-30, ISO 81060-2.	
Technique	Oscillometry
Operation mode	Manual, Auto, STAT, Program
Parameters	Systolic, diastolic, mean, Heart Rate
Auto mode intervals	1, 2, 2.5, 3, 5, 10, 15, 20, 30, 60, 90, 120min
STAT mode cycle time	5 min
Max Measure 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

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

Meet standards of ISO 80601-2-61.	
SpO <sub>2</sub> range	0 to 100 %
SpO <sub>2</sub> resolution	1%
SpO <sub>2</sub> accuracy	70 to 100%: ±2% (without motion in adult /pediatric mode) 70 to 100%: ±3% (without motion in neonate mode) 0% to 69%: Not specified.
Perfusion indicator (PI)	Yes, for Mindray SpO <sub>2</sub>
Pitch Tone	Yes

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

Meet standards of ISO 80601-2-61.	
SpO <sub>2</sub> range	1 to 100 %
SpO <sub>2</sub> resolution	1%
SpO <sub>2</sub> accuracy	70 to 100%: ±2% (without motion in adult /pediatric mode) 70 to 100%: ±3% (without motion in neonate mode) 70 to 100%: ±3% (measured with motion) 1% to 69%: Not specified.
Perfusion indicator (PI)	Yes, for Masimo SpO <sub>2</sub>
Pitch Tone	Yes

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

Meet standards of ISO 80601-2-61.	
SpO <sub>2</sub> range	0 to 100 %
SpO <sub>2</sub> resolution	1%
SpO <sub>2</sub> accuracy	70 to 100%: ±2% (adult/pediatric) 70 to 100%: ±3% (neonate) 0% to 69%: Not specified..
Perfusion indicator (PI)	No
Pitch Tone	Yes

### PR from Mindray SpO<sub>2</sub>

PR range	20 to 300 bpm
PR accuracy	± 3 bpm (without motion)

### PR from Masimo SpO<sub>2</sub>

PR range	25 to 240 bpm
PR accuracy	± 3 bpm (without motion) ± 5 bpm (with motion)

### PR from Nellcor SpO<sub>2</sub>

PR range	20 to 300 bpm
PR accuracy	±3 bpm (20 to 250 bpm) not specified ( 251 to 300 bpm)

### PR from NIBP

PR range	30 to 300 bpm
PR accuracy	± 3 bpm or ±3%, whichever is greater

### SmarTemp™ Temperature

Meet standard of ISO 80601-2-56.	
Technique	Thermal resistance
Operating mode	Adjusted mode (predictive mode) Direct mode (monitor mode)
Measurement range	Monitor mode: 25 °C to 44 °C (77 °F to 111.2 °F) Predictive mode: 35 °C to 43 °C (95 °F to 109.4 °F)
Accuracy (Monitor mode)	25 °C to 32 °C (not include 32 °C): ±0.2 °C 32 °C to 44 °C (include 32 °C): ±0.1 °C or 77°F to 89.6°F (not include 89.6°F): ±0.4 °F 89.6°F to 111.2°F (include 89.6 °F): ±0.2 °F
Resolution	±0.1 °C or ± 0.2 °F
Refreshing rate	1 s

### 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 or 0.1 °F
Response time	< 2 s

### THP79JU Infrared Ear Thermometer

Technique	Infrared.
Measurement range	32 °C to 42.2 °C (89.6 °F to 108 °F)

## Exergen TemporalScanner™ Thermometer

Measurement range	16°C to 43 °C
Accuracy	± 0.2 °C
Resolution	0.1 °C
Battery Type	Alkaline battery, 9V
Battery Run time	1 hour continuous use or 15000 readings

## CO<sub>2</sub>

Meet standard of ISO 80601-2-55.

CO <sub>2</sub> sample flow rate	Connecting the Oridion sampling line: 50 ml/min
CO <sub>2</sub> sample flow rate tolerance	± 15 ml/min or ±15 %, whichever is greater.
Response time	Measured with a Oridion sampling line: ≤5s @ 50ml/min (standard sampling line) ≤6.5s @ 50ml/min (extended sampling line)
CO <sub>2</sub> range	0 to 20% ( 0 to 150 mmHg)
CO <sub>2</sub> accuracy, full accuracy mode:	±0.1% (CO <sub>2</sub> concentration<1%) ±0.2% (1%≤CO <sub>2</sub> concentration<5%) ±0.3% (5%≤CO <sub>2</sub> concentration<7%) ±0.4% (7%≤CO <sub>2</sub> concentration<12%) ±0.5% (12%≤CO <sub>2</sub> concentration≤13%) ±0.43%+8%rel (13%<CO <sub>2</sub> concentration≤20%) Unspecified (CO <sub>2</sub> concentration>20%)
CO <sub>2</sub> accuracy, ISO accuracy mode:	Add ±0.3% ABS to the full accuracy
CO <sub>2</sub> resolution	1 mmHg
awRR range	0 to 150 rpm
awRR accuracy	± 1 rpm (<60 bpm) ± 2 rpm (60 to 150 rpm)
awRR resolution	1 rpm
Apnea time	10, 15, 20, 25, 30, 35, 40 s

## Alarms

Audible indicator	3-level audible alarm tones
Visible indicator	Alarm message, with 3 level lamp indicator High level alarm, red with flashes Medium level alarm, yellow with flashes Low level alarm, yellow without flashing

## Data Management

Trends review	5000 groups
Data output	HL7 format

## Network

CMS connectivity	Support
3 <sup>rd</sup> party system connectivity	via eGateway, VitalsLinks Direct connecting to EMR through HL7 protocol

## Wi-Fi Communications

WiFi support	Yes, 5G band
Protocol	MSD45N module, IEEE 802.11a/b/g/n WM1010BGN module, IEEE 802.11b/g/n

## Interfacing

Main unit	AC power connector (1) Network connector (1), standard RJ45 USB 2.0 connector (2)
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SMR connector (1)	
Multi-function connector (1), nurse call	
Barcode scanner	Support 1D and 2D barcode (RFID)
Thermal Recorder	Integral thermal array recorder
	Paper speed: 25 mm/s

## Power

AC line voltage	100 to 240 VAC (±10 %)
AC frequency	50/60 Hz (±3 Hz)
AC current	0.9 to 0.5 A
Battery type	Rechargeable lithium-ion battery,
Battery run time	At least 3 hours (2600mAh battery) At least 8 hours (4500mAh battery)

## Environmental Requirements

### Main unit

Temperature	Operating: 0 to 40 °C Storage: -20 to 60 °C
Relative humidity	Operating: 15 to 95 % (non condensing) Storage: 10 to 95 % (non condensing)
Barometric	Operating: 57.0 to 107.4 kPa Storage: 16.0 to 107.4 kPa

### SmarTemp™ Temperature Module

Temperature	Operating: 5 to 40 °C Storage: -20 to 60 °C
Relative humidity	Operating: 15 to 95 % (non condensing) Storage: 10 to 95 % (non condensing)
Barometric	Operating: 57.0 to 107.4 kPa Storage: 16.0 to 107.4 kPa

### Genius™ 2 Tympanic Module

Temperature	Operating: 16 to 33 °C (60.8°F to 91.4 °F) Storage: -25 to 60 °C (-13 °F to 131 °F)
Relative humidity	Operating: 10 to 95 % (non condensing) Storage: up to 95% (non condensing)

### THP79JU Infrared Ear Module

Temperature	Operating: 10 to 40 °C (50 °F to 104 °F) Storage: -25 to 55 °C (-13 °F to 140 °F)
Relative humidity	Operating: ≤95% (non condensing) Storage: ≤95% (non condensing)

### Exergen TemporalScanner™ Thermometer

Temperature	Operating: 16 to 40 °C Storage: -20 to 50 °C
Relative humidity	Operating: 15 to 95 % (non condensing) Storage: 10 to 95 % (non condensing)
Barometric	Operating: 57.0 to 107.4 kPa Storage: 16.0 to 107.4 kPa

## EMC Compliance

Meets the requirements of IEC 60601-1-2: 2014.

## Classifications

Defibrillation proof (protection against electrical shock)	
Type CF	SpO <sub>2</sub> , NIBP, and SmarTemp™ Temp
Type BF	CO <sub>2</sub> , Exergen TemporalScanner™,
Type BF	THP79JU and Genius™ 2 Temp
Water proof	IPX1
Degree of mobility	Portable

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)

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