PHILIPS

*EarlyVue*

VS30 vital signs monitor

# **Early detection.** Intelligent intervention.

EarlyVue VS30 vital signs monitor technical data sheet

# Specs that matter, clinical **benefits that count**

## Simplify your workflow

- **Task Light:** illuminates area below the monitor
- **Dark/Light Display:** helps avoid screen glare
- **QuickCheck**
  - Caregiver authentication at the bedside
  - Patient ID and/or record validation at the bedside
  - Patient record export via native HL7 to EHR
- **QuickCapture**
  - Customize up to 40 parameters and observations entries for full documentation at the bedside
- **QuickAlerts**
  - Choose Single or Modified Early Warning Scoring
  - Configurable EWS; auto-calculates at the bedside
  - Compatible with Philips Guardian (Rev E.01 or up)
- **QuickNBP**
  - Provides faster NBP measurements
  - One-touch NBP on/off button
- **$SpO_2$**
  - Choice of Philips $SpO_2$ or Masimo rainbow SET®
- **SpHb and RRa options**
  - Enabled with Masimo rainbow SET
- **Microstream™ $etCO_2$ option**
  - Includes Integrated Pulmonary Index (IPI)
- **Temperature choices**
  - Welch Allyn® Predictive or Exergen® Temporal
- **Biomedical and IT device maintenance tool kit**
  - Philips Device Management Dashboard, Rev A.02
- **Dual purpose barcode scanners**
  - Support consistent and reliable patient and user ID entry

**Other benefits**

- 10.1" color touch screen; toggle between dark and light display
- Uses same supplies as many other Philips monitors
- Time-sync with hospital or network clock
- Stores up to 1,000 patient records
- Programmable auto-delete and auto-hide records
- Confirmation of exported records easily seen - green oval
- LAN/WLAN/serial data export in HL7 format
- Internal WiFi – 802.11 a/b/g/n option
- USB ports for easy software upgrades and config settings
- Lithium ion, 9-cell smart battery
- Battery management, includes visible icon to show device is plugged in and charging

**Side panel fixed key**
- On/standby
- AC power LED
- Charging LED

**Alarms**
- Three alarm severity levels (high, medium, low) that determine the monitor's visual and audio response
- Visual alarm indicators, including flashing numeric panes, alarm messages, alarm icons and 360° alarm light
- Audible alarms configurable for volume, tone, and silence
- Configurable alarm limits
- Ability to latch all physiological alarms
- Automatically set alarm limits based on the patient's current vital sign values

**Device connections**
- USB ports for software upgrades, barcode scanner connection, or serial interface adapter connection
- Ethernet port for exporting HL7 data
- Nurse call connector for alarm output to a nurse call system
  - Connector 3.5 mm phone jack, N.O and N.C contacts
  - Contact rating ≤ 1 A @ <25 VAC, <60 VDC
  - Isolation 1.5 kV
  - Delay time <1 sec
- Wireless data export

**Standards**
- IEC 60601-1, IEC 60601-1-2,IEC 60601-1-6: IEC 60601-1-8, IEC 80601-2-30, IEC 60601-2-49, ISO 80601-2-55, ISO 80601-2-56, ISO 80601-2-61
- Protection class: Class I, internally powered equipment, per IEC 60601-1
- Degree of protection: Type CF defibrillator-proof: per IEC 60601-1
- Ingress of liquids: IPX1
- Protection against hazards of ignition of flammable anaesthetic mixtures: equipment is not suitable for use in the presence of a flammable anaesthetic mixture with air or oxygen or nitrous oxide, per IEC 60601-1

**Wireless radio compliance standards**
- ETSI: EN 300 328, EN 301 489-1, EN 301 489-17, EN 301 893, EN 60950-1
- FCC Regulatory Domain: Part 15.247 Subpart C Part 15.407 Subpart E
- Industry Canada: RSS-210/RSS-Gen Issue 2

**Physical (not to exceed) specifications**
- Width: 33 cm
- Height: 23 cm
- Depth: 23 cm
- Weight: 5 kg or less, fully optioned and battery inserted

**Display**
- Screen type: 10.1 in LCD with 5-wire resistive touchscreen
- Refresh frequency: 60 Hz
- Resolution: 1280 active pixels/line, 800 active lines/frame
- Screen active area: 216.96 mm x 135.6 mm
- Pixel Pitch: 0.1695 mm x 0.1695 mm
- Viewing angle: ±85°

**Recorder**
- Recorder type: thermal
- Paper width: 58 mm
- User selectable speeds: 6.25, 12.5, 25, and 50 mm/sec

## Environmental specifications

Complies with mechanical shock and vibration requirements in IEC 80601-2-30, ISO 80601-2-55, 80601-2-56 and, 80601-2-61 standards for use within a professional health care facility.

| **Shock** | |
|---|---|
| Peak acceleration | 150m/s$^2$ (15g) |
| Duration | 11 ms |
| Pulse shape | Half sine |
| Number of shocks | 3 shocks per direction per axis (18 total) |

| **Vibration** | |
|---|---|
| Frequency range | 10 Hz to 2000 Hz |
| Resolution | 10 Hz |
| Acceleration amplitude | 10 Hz to 100 Hz: 1.0 (m/s$^2$)$^2$/Hz<br>100 Hz to 200 Hz: -3.0 dB/octave<br>200 Hz to 2000 Hz: 0.5 (m/s$^2$)$^2$/Hz |
| Duration | 10 minutes per each perpendicular axis (3 total) |

| **Thermal** | |
|---|---|
| Operating temperature | 10°C to 40°C (50°F to 104°F) monitor<br>16°C to 40°C (60°F to 104°F) monitor with temporal thermometer |
| Storage | -20°C to 50°C (-4°F to 122°F) monitor<br>-20°C to 40°C (-4°F to 104°F) monitor with accessories |

| **Humidity, operating, and storage** |
|---|
| 10% to 90% RH (non-condensing) for monitor |
| 10% to 80% RH for monitor with recorder and paper |

## Electrical specifications

| | |
|---|---|
| Battery | Lithium ion, Smart battery<br>11.1 V 7800 mAh |
| Battery operating time (new, fully charged battery) | At least 6 hours of monitoring $SpO_2$ continuously and NBP measured every 15 minutes |
| Battery charge time to 90% | <4 hours when unit is in suspend and with supported battery |
| Internal power supply | 100 VAC to 240 VAC |
| Maximum output power consumption | 60 W |
| Frequency | 50/60 Hz |

## Non-invasive blood pressure (NBP)

| | |
|---|---|
| Technique | Oscillometric using stepwise deflation pressure |
| Subsequent cuff inflation (in NBP Interval mode only) | Determined automatically depending on the previous measurement and patient type |

| **Adult range** | |
|---|---|
| Systolic | 30 mmHg to 270 mmHg |
| Diastolic | 10 mmHg to 240 mmHg |
| MAP | 20 mmHg to 250 mmHg |
| Pulse rate range | 40 bpm to 300 bpm |

| **Pediatric range** | |
|---|---|
| Systolic | 30 mmHg to 180 mmHg |
| Diastolic | 10 mmHg to 150 mmHg |
| MAP | 20 mmHg to 160 mmHg |
| Pulse rate range | 40 bpm to 300 bpm |

| **Neonatal range** | |
|---|---|
| Systolic | 30 mmHg to 130 mmHg |
| Diastolic | 10 mmHg to 100 mmHg |
| MAP | 20 mmHg to 120 mmHg |
| Pulse rate range | 40 bpm to 300 bpm |

| **BP accuracy** | |
|---|---|
| Maximum standard deviation | 8 mmHg |
| Maximum mean error | ±5 mmHg |

| **Pulse rate accuracy** | |
|---|---|
| 40 bpm to 100 bpm | ±5 bpm |
| 101 bpm to 200 bpm | ±5% of reading |
| 201 bpm to 300 bpm | ±10% of reading |

| **Initial inflation pressure (factory default settings)** | |
|---|---|
| Adult | 160 mmHg (21.3 kPa) |
| Pediatric | 140 mmHg (18.7 kPa) |
| Neonatal | 100 mmHg (13.3 kPa) |

| **NBP interval choices** |
|---|
| Automatic measurements at configured interval of Off, 1, 2, 3, 5, 10, 15, 30, 60, 90 or, 120 minutes or STAT |
| Up to five interval programs can be defined |

## Predictive temperature

| | |
|---|---|
| **Measurement range** | |
| Monitored mode | 26.7°C to 43.3°C (80.1°F to 109.9°F) |
| Predictive mode | (Adult and pediatric) |
| Oral | 35.6°C to 40.5°C (96.1°F to 104.9°F) |
| Axillary | 34.5°C to 40.5°C (94.0°F to 104.9°F) |
| Rectal | 29.0°C to 42.0°C (84.1°F to 107.9°F) |
| **Accuracy** | ±0.1°C (±0.2°F) Monitored mode |
| **Measurement time** | 4-6 seconds Oral<br><16 seconds Axillary and rectal |
| **Resolution** | 0.1°C (0.1°F) |

## Temporal temperature

| | |
|---|---|
| **Measurement range** | 16°C to 43°C (61°F to 110°F) |
| **Accuracy** | ±0.1°C (±0.2°F) per ASTM E1112 |
| **Measurement time** | ≤ 1 second |
| **Arterial heat balance range for body temperature** | 34.5°C to 43°C (94°F to 110°F)<br>Normal range is defined as 35.9°C to 37.5°C (96.6°F to 99.5°F) with mean of 37°C (98.6°F). |
| **Resolution** | 0.1°C or 0.1°F on probe or on monitor |

## Masimo rainbow™ measurements

| | |
|---|---|
| **SpHb Accuracy** | ±1 g/dl (1.0 mmol/l); range 8 g/dl - 17 g/dl |
| **RRa Accuracy** | ±1 breath per min.; range 4 - 70 breaths/min. |

Total Hemoglobin (SpHb) and Acoustic Respiration (RRa), enabled with Masimo rainbow, is only supported on Adult (>30 kg) and Pediatric patients (>10 kg).

## Philips FAST $SpO_2$

| | |
|---|---|
| **Measurement range** | 0% to 100% |
| **Accuracy** | 70% to 100% ±2% to 4%<br>for all approved sensors |
| **Pulse rate** | 30 bpm to 300 bpm |
| **Pulse rate accuracy** | Within 2% or 1 bpm,<br>whichever is greater |
| **Wavelength range** | 500 nm to 1000 nm<br>for all specified sensors |

## Masimo rainbow SET™ $SpO_2$

| | |
|---|---|
| **Measurement range** | 0% to 100% |
| **Accuracy** – Adults, pediatrics, infants, and neonates | |
| Motion | 70% to 100% ± 3% |
| Low perfusion | 70% to 100% ± 2% |
| **Accuracy** – Adults, pediatrics, infants | |
| No motion | 60% to 80% ± 3% |
| | 70% to 100% ± 2% |
| No motion | 70% to 100% ± 3% (neonates only) |
| **Pulse rate** | 25 bpm to 240 bpm |
| **Pulse rate accuracy** – Adults, pediatrics, infants, and neonates | |
| No motion | ±3 bpm |
| Motion | ±5 bpm |
| Low perfusion | ±3 bpm |
| **Wavelength range** | 500 nm to 1400 nm for all specified sensors |

## $CO_2$

| | |
|---|---|
| Measurement range | 0 mmHg to 150 mmHg |
| Sampling flow rate | 50 ml/min, (+15 ml/min, -7.5 ml/min) flow measured by volume |
| $CO_2$ reporting resolution | 0.1 mmHg |
| $etCO_2$ and $imCO_2$ displayed resolution | 1 mmHg |
| Initialization time | 30 seconds (typical), maximum 3 minutes |
| Total response time for adults/pediatrics | 3.9 seconds, for 10% to 90% changes in $CO_2$ concentration |
| Maximum $CO_2$ response time (with a standard-length FilterLine™) | 5.3 seconds (typical) |
| Calibration interval | Initially 1,200 hours or one year (whichever comes first), once per year or 4,000 hrs (whichever comes first) |
| Accuracy | 0 mmHg to 38 mmHg: ±2 mmHg<br>39 mmHg to 150 mmHg: ± (5% of reading + 0.08% for every 1 mmHg above 38 mmHg) |
| Respiration rate accuracy | ±1 rpm in the range of 0 rpm to 70 rpm<br>±2 rpm in the range of 71 rpm to 120 rpm<br>±3 rpm in the range of 121 rpm to 150 rpm |

## Wireless

| | |
|---|---|
| Networking standards | IEEE 802.11a, 802.11b, 802.11d, 802.11e, 802.11g, 802.11h, 802.11i, 802.11n |

### WiFi transmit power settings

| | |
|---|---|
| 802.11a | 6 Mbps 15 dBm (32 mW)<br>54 Mbps 12 dBm (16 mW) |
| 802.11b | 1 Mbps 16 dBm (40 mW)<br>11 Mbps 16 dBm (40 mW) |
| 802.11g | 6 Mbps 16 dBm (40 mW)<br>54 Mbps 12 dBm (16 mW) |
| 802.11n (2.4 GHz) | 6.5 Mbps (MCS0) 16 dBm (40 mW)<br>65 Mbps (MCS7) 12 dBm (16 mW) |
| 802.11n (5 GHz) | 6.5 Mbps (MCS0) 15 dBm (32 mW)<br>65 Mbps (MCS7) 12 dBm (16 mW) |

### Security standards

| |
|---|
| WEP, WPA, and WPA2 |
| 802.11X Extensible Authentication Protocol Type: EAP-TLS, EAP-TTLS, PEAP-MSCHAPv2 |
| WiFi certified |
| Cisco compatible |

### Typical receiver sensitivity[1]

| | |
|---|---|
| 802.11a | 6 Mbps -90 dBm<br>54 Mbps -73 dBm (PER ≤10%) |
| 802.11b | 1 Mbps -89 dBm<br>11 Mbps -82 dBm (PER ≤10%) |
| 802.11g | 6 Mbps -85 dBm<br>54 Mbps -68 dBm (PER ≤10%) |
| 802.11n (2.4 GHz) | MCS0 Mbps -86 dBm<br>MCS7 Mbps -65 dBm |
| 802.11n (5 GHz) | MCS0 Mbps -90 dBm<br>MCS7 Mbps -70 dBm |

Note: All values nominal, +/-3 dBm.

### Antenna test specifications

| | |
|---|---|
| Type | Dipole |
| Maximum 2.4 GHz gain | 2 dBi |
| Maximum 5.6 GHz gain | 4.0 dBi |

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