X Series®

Technical Specifications:

Because Medics Carry More These Days

- At less than 12 pounds/6 kilograms, the X Series is up to half the size and weight of other full-featured devices.

- Its large, bright screen allows for simultaneous viewing of four traces, all 12 ECG leads, or static and dynamic 12-lead views on a "split screen."

- The device also incorporates the latest, most advanced and most complete monitoring capabilities, including "gold standard" Masimo® rainbow® SET Pulse CO-Oximetry and Welch Allyn's Rapid NIBP technology to improve accuracy and reliability.

- Trauma-specific parameters deliver insight on occult hemorrhage (SpHb™), fluid responsiveness (PVI™), and oxygenation status (SpOC™).

Because CPR Is a Focus for Cardiac Arrest

- CPR Dashboard™ provides real-time numeric depth and rate values and has a CPR timer that switches to an idle timer when compressions are stopped. The release indicator and the perfusion performance indicator (PPI) also help maximize CPR performance.

- See-Thru CPR® (unique to ZOLL®) helps minimize the duration of interruptions by filtering out artifact, allowing you to see organized underlying rhythms during CPR.

Simplify Charting with Advanced Communication

- The X Series is the first monitor/defibrillator with integrated WiFi. Bluetooth® and USB cellular modem capabilities are standard as well.

- With the push of a button, medics can now directly send X Series files to your system. With RescueNet CaseReview, access to case files is as fast and easy as opening your web browser.

- The X Series acquires, stores, and transmits 12-leads to ZOLL's easy-to-use and economical RescueNet 12-Lead and RescueNet MedGate 12-Lead management systems.

ZOLL®

General
Weight: 11.7 lbs. (5.3 kg) with battery and paper
Dimensions: 8.9 in (22.6 cm) x 10.4 in (26.4 cm) x 7.9 in (20.1 cm)
Enclosure Protection: Solid Foreign Object: IEC 60529, IP5X
Water: IEC 60529, IPX5
Operating: Temperature:
0 to 50°C
Humidity: 15 to 95% RH (non-condensing)
Vibration: MIL-STD 810G, Method 514.6, 4.4.2 Procedure II
EN ISO 9919 (per IEC 60068-2.64)
EN 1789 for ambulance. RTCA/DO-160G (multiple helicopter frequencies)
Shock: IEC 60068-2-27, 100g, 6 ms half sine
Drop: EN 1789, 30-inch functional drop, IEC 60601-1, tested at 2 meters
Altitude: -170 m to 4572 m (-557 feet to 15,000 feet)

Monitor/Display
Size: 6.5 in (16.56 cm) diagonal
Input: 3-lead, 5-lead, or 12-lead patient cable, paddles, or multifunction electrodes
Type: Color LCD, 640 x 480 pixels, 800 MCD
Sweep Speed: 25 mm/sec or 50 mm/sec (user selectable)
Lead Selections: Paddles (Pads), I, II, III, AVR, AVL, AVF, V1-6
Frequency Response:
(user selectable)
0.67 – 20 Hz Limited mode
0.67 – 40 Hz Monitor mode
0.25 – 40 Hz Filtered diagnostic mode
0.05 – 150 Hz Diagnostic mode

Defibrillator
Waveform: Rectilinear Biphasic™
Energy Selections: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 15, 20, 30, 50, 70, 85, 100, 120, 150, 200 joules
Energy Display: Display indicates selected and delivered energy
Charge Time: Less than 7 seconds with a new, fully charged battery
Charge Controls: Front panel and on apex paddle
Pads/Paddles: Hands-free pads and external adult and pediatric paddles. Adult paddles slide off to expose pediatric paddles.
Synchronized Mode: Synchronizes defibrillator pulse to patient's R wave. "SYNC" message displayed on monitor and markers shown on both monitor and recorded ECG. Meets Clause 104 of AAMI DF80.

Patient Modes
User Selectable: Adult, Pediatric, Neonate. Automatically sets configurable defaults for alarm limits, defibrillation energy, and NIBP settings.

Trends (on-screen)
Tabular numeric format
All parameters trended/viewable
Trend Intervals: 1, 5, 10, 15, 30, 60 minutes
Duration: 24 hours at 1-minute intervals
Snapshots: Minimum of 32 (12 seconds of pre- and post-button press)
Quick-access trend display via quick-access button

Memory Capacity
A combination of 24 hours of trends at 1-minute intervals, 1000 time-stamped events, and 32 snapshots, including monitor, defibrillator, pacer, and treatment snapshots

Pacer
Type: External transcutaneous pacing
Pulse Types: Rectilinear, constant current
Pulse Width: 40 ms ± 2 ms
Pacer Rate: 30 – 180 bpm ± 1.5%
Output Current: 0 – 140 mA ± 5% or 5 mA, whichever is greater
Modes: Demand and Fixed

CPR
CPR Feedback Technology
See-Thru CPR®: Artifact filtering
Real CPR Help®: Real-time depth and rate feedback
CPR Dashboard™: Numeric readout of depth and rate, release indicator, perfusion performance indicator (PPI)

ECG
Cable Detection: Automatic 3-, 5-, 12-lead ECG
Input: 3-lead cable, 5-lead cable, 12-lead cable, paddles, therapy cable
Leads: I, II, III, AVR, AVL, AVF, V1 – V6
Heart Rate Range: 30 – 300 bpm
Heart Rate Accuracy: ± 3 bpm or 3%
Pacer Detection and Display
ECG Sizes: 0.125, 0.25, 0.5, 1, 2, 4 cm/mV, and auto-ranging
Sweep Speed: 25 mm/sec, 50 mm/sec

Masimo® SET SpO$_2$
Saturation Range: 1 – 100%
Saturation Accuracy:
Oxygen saturation during no-motion conditions:
Adults, Pediatrics: 70 – 100%, ± 2 digits
0 – 69%, unspecified
Neonates: 70 – 100%, ± 3 digits
0 – 69%, unspecified
Oxygen saturation during motion conditions
Adults, Pediatrics: 70 – 100%, ± 3 digits
0 – 69%, unspecified
Neonates: 70 – 100%, ± 3 digits
0 – 69%, unspecified
Oxygen saturation during low-perfusion conditions:
Adults, Pediatrics 70 – 100%, ± 2 digits
0 – 69%, unspecified
Neonates, 70 – 100%, ± 3 digits
0 – 69%, unspecified
Pulse Rate Range: 25 – 240 bpm
Pulse rate during no-motion conditions:
Adults, Pediatrics,
Neonates: 25 – 240 ± 3 digits
Pulse rate during motion conditions
Adults, Pediatrics,
Neonates: 25 – 240 ± 5 digits

SpO$_2$ Average time setting:
4, 8 (default), 16 seconds
Masimo rainbow® SET SpCO®
Range: 0 – 99%
Accuracy: 1 – 40% ± 3 digits
Masimo rainbow® SET SpMet®
Range: 0 – 99%
Accuracy: 1 – 15% ± 1 digits
Masimo rainbow® SET SpHb®
Measurement Range: 0 – 25 g/dL
Accuracy (Adults/Infants/Pediatrics): 8 – 17 g/dL +/- 1 g/dL
Resolution (SpHb g/dL): 0.1 g/dL
Masimo rainbow® SET SpOC™
Measurement Range: 0 – 35 mL of O2/dL of blood
Resolution: 0.1 ml/dL
Masimo Perfusion Index (PI)
Measurement Range: 0.02 – 20%
Resolution: 0.1%
Masimo Pleth Variability Index (PVI®)
Measurement Range: 0 – 100%
Resolution: 1%

Non-Invasive Blood Pressure (NIBP)
Smartcuf® and Sure BP® NIBP technology
Measurement Intervals: Automatic 1-, 2-, 3-, 5-, 10-, 15-, 30-, 60-minute, and manual quick-action NIBP Start/Stop button
TurboCuf: 5 min of repeated NIBP readings
Display: Systolic, diastolic, mean. Viewable on-screen with large numerics.
Cuff Overpressure Protection
Typical Measurement Time:
30 – 45 sec (on deflation)
15 – 30 sec – Sure BP (on inflation)
Standard Cuff Sizes: Neonate #1 – #5, Infant, Small Child, Small Adult, Adult Long, Large Adult, Thigh
Default Cuff Inflation Pressure:
Adults: 160 mmHg
Pediatrics: 120 mmHg
Neonates: 90 mmHg
Pressure Measurement Range:
Systolic: 20 – 260 mmHg
Diastolic: 10 – 220 mmHg
Mean: 13 – 230 mmHg
Maximum Cuff Inflation Pressure:
Adults: 270 mmHg
Pediatrics: 170 mmHg
Neonates: 130 mmHg

Microstream® etCO$_2$
Range:
0 – 150 mmHg
Accuracy:
0 – 38: ± 2 mmHg
39 – 150: ± 5% + .08% mmHg >38
Respiration Range: 0 – 149 breaths per minute
Respiration Rate Accuracy:
0 – 70 bpm ± 1 bpm
71 – 120 bpm ± 2 bpm
121 – 149 bpm ± 3 bpm
Flow rate: 50 ml/min -7.5 + 15 ml/min
Typical response time: 2.9 seconds
Maximum response time: 3.9 seconds

Impedance Pneumography
Displayed Data: Numeric breath rate, Impedance waveform
Breath Rate Range: Adult, Pediatric: 2 to 150 breaths/minute. Neonates: 3 to 150 breaths/minute.

Breath Rate Accuracy: 2% or ± 2, whichever is greater
Displayed Breath Rate: Average of last 10 breath-to-breath rates
Leads: Lead I (RA – LA), Lead II (RA – LL)
Sweep Speed: 3.13, 6.25, 12.5 mm/sec
Alarm Settings: High, low, and no breath rate alarm

Invasive Pressure
Three Channels
Pressure Range: -30 – 300 mmHg
Pulse Rate Measurement Range:
25 – 250 bpm
Formats: S/D, S/D (M), (M) user selectable
User-Selectable Labels: P1, P2, P3, ABP, AO, ART, CVP, BAP, FAP, LAP, PAP, RAP, UAP, UVP, ICP
Transducer Requirements:
5M µV/V/mmHg
Zero Adjustment: ± 200 mmHg
Numeric Pressure Accuracy: ± 2 mmHg or 2% reading, whichever is greater of reading, plus transducer error
Transducer Connector: Standard 6-pin MS connector

Temperature
Two YSI 400/700 series-compatible channels
Range: 0 – 50°C (32 – 122°F)
Units: °C or °F
Display: T1, T2, and Delta temp
Accuracy: ± 0.1°C (± 0.06°F) from 10 – 50°C (50 – 122°F) ± 0.2°C (± 0.11°F) from 0 – 10°C (32 – 50°F)

Printer
Type: High-resolution thermal array
Annotation: Time, date, ECG lead, ECG gain, heart rate, defibrillation, and pacing parameters and treatment summary events
Paper Width: 80 mm
Paper Speed: 25 mm/sec, 50 mm/sec
Delay: 6 seconds
Frequency Response: Automatically set to monitor's frequency response
Record Modes: Manual and automatic (user configurable)
Print Option Single waveform or a combination up to 3, on alarm, snapshots, treatment summary report, and trend summary

Battery
Type: Rechargeable lithium-ion, 11.1 Vdc, 6.6 Ah, 73 Wh
Capacity: With a new, fully charged battery operating at room temperature: At least 6 hours of continuous monitoring of ECG, SpO$_2$, CO$_2$, 3 invasive pressure channels, and 2 channels of temperature, with NIBP measurements every 15 minutes and 10 200-joule shocks. 300 shocks at 200 joules with fully charged new battery at room temperature. At least 3.5 hours pacing, with ECG, SpO$_2$, CO$_2$, three invasive pressures, temperature, NIBP every 15 minutes and pacing at 180 ppm, and 140 mA.
AC Power Adapter: 100 – 240 VAC 50, 60 Hz, 2A 100 – 115 VAC 400Hz, 2A

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