

# ZOLL

# M Series

## The Smallest, Lightest, Most Advanced Defibrillator Monitor Pacemaker Ever Made

With Interpretive 12-lead ECG and Optional  
Catalyst™ MUSE® Direct Connectivity



# 12-LEAD

# ZOLL

*It's about time.*

## ZOLL M Series

- Superior clinical outcomes with ZOLL pacing and the unique low energy ZOLL Rectilinear Biphasic waveform
- Industry standard GE Medical Systems 12SL Interpretive ECG Algorithm
- Easy one button acquisition provides automatic 4 x 3 printout, interpretation and optional global measurements
- Rapid entry of patient data utilizing on-screen alphanumeric text
- Preconfigured telephone numbers with auto dial make 12-lead data transmission via cell phone or land-line fast and easy
- Direct Catalyst™ MUSE® connectivity providing online comparison of pre-hospital and hospital patient ECG's.

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## ZOLL M Series Interpretive 12-lead ECG and Catalyst™ MUSE® Interface

The ZOLL M Series provides total diagnostic and therapeutic capabilities in a small, lightweight unit with a high contrast display. The M Series includes easy-to-use defibrillation, external pacing, interpretive 12-lead ECG, SpO<sub>2</sub>, EtCO<sub>2</sub>, NIBP, built-in AC or DC power and a complete data management system.

### M Series Specifications

#### ECG Monitoring

**Patient Connection:** 3-lead ECG cable, 5-lead ECG cable, 12-lead ECG cable, paddles or MFE Pads. Selectable by front panel switch.

**Input Protection:** Fully defibrillator protected. Special circuit prevents distortion of ECG by pacemaker pulse. (Pacer version only)

**Implanted Pacemaker Spike Display:** Dedicated circuitry detects most implanted pacemaker spikes and provides standard display marker of spike on ECG trace.

**Bandwidth:** 0.5-40 Hz (-3 dB) or 0.5-30 Hz; 0.05-150 Hz diagnostic.

**Lead Selection:** Displayed on monitor.

**ECG Size:** 0.5, 1, 1.5, 2, 3 cm/mV - display on monitor.

**Heart Rate:** Digital display 0-300 bpm ±5%.

**Heart Rate Alarm:** On/Off displayed on monitor. User-selectable, tachycardia 60-280 bpm, bradycardia 20-100 bpm.

**1 Volt ECG Out:** 1.0 volt/cm of deflection on strip chart recorder. <25 ms delay from patient ECG input.

**Display Format:** Non-fade moving bar display.

**SmartAlarms™:** Beeper/voice prompts indicate shockable rhythm.

#### Display

**Screen Type:** High-resolution display.

**Screen Size:** 5 inches (12.7 cm) diagonally.

**Sweep Speed:** 25 mm/sec.

**Viewing Time:** 4 seconds.

**Channels:** 2.

**Information:** Heart Rate, Lead/Pads, Alarm On/Off, SpO<sub>2</sub>, EtCO<sub>2</sub>, NIBP AED Functions and Prompts, Defibrillator Test Function, Error Corrections and Faults, Pacer Functions (optional), Code Markers, Alarm Selection and Limits, Delivered Energy.

#### Defibrillator

**Waveform:** Damped sinusoid or ZOLL Rectilinear Biphasic.

**Energy Selection:** Selectable at 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 15, 20, 30, 50, 75, 100, 150, 200, 300, 360 joules. (Delivered into 50Ω load.) Selected using controls on sternum paddle or device front panel. Rectilinear Biphasic energy selection up to 200 joules maximum.

**Charge Time:** Less than 7 seconds with a new fully charged battery (first 15 charges to max energy.) Depleted batteries will result in a longer defibrillator charge time.

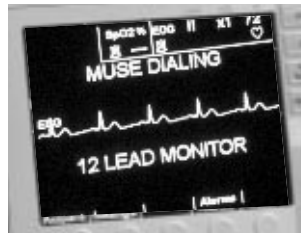
**Energy Display:** Monitor display indicates both selected and delivered energy.

**Synchronized Mode:** Synchronizes defibrillator pulse to patient's R-wave. "SYNC" message displayed on monitor. Marker on display and recorder paper identifies R-wave discharge point.

**Advisory Function:** Single analysis or programmable auto re-analyze x3 with programmable auto energy level selection, screen prompts, and voice prompts.

**AED Function:** Auto analyze and charge x3 with programmable auto energy level selection, screen prompts, and voice prompts.

**Charge Controls:** Control on apex paddle and on device front panel.



Pre-configured phone numbers provide easy, quick transmission to standard fax machines and MUSE systems.\*\*

**Paddles:** External anterior/anterior adult and pediatric. Adult paddles slide off to expose pediatric paddles.

**Multi-Function Electrode (MFE) Pads:** Specifically designed pre-gelled ZOLL stat-pad™ Multi-Function Electrodes packaged in pairs.

**Built-In Defibrillator Tester:** Tests defibrillator energy output and continuity of universal cable and paddles; documented on PCMCIA card and strip chart.

**Defibrillation Advisory:** Evaluates electrode connection and patient ECG to determine if defibrillation is required.

**Shockable Rhythms:** Ventricular fibrillation with amplitude >100 µV and wide complex ventricular tachycardia with rates greater than 150 bpm.

**Multi-Function Electrode Impedance Measurement Range:** 0-250 ohms.

#### 12-lead ECG and MUSE Interface

**12 Simultaneously Acquired ECG Leads**

**12-lead ECG Bandwidth:** 0.05 to 150 Hz.

**Optional Bandwidth:** 0.05 to 40 Hz.

**Sampling Rate:** 500 sps.

**A/D Resolution:** 18-bits.

**ECG Waveform Formats Supported:** 4x3 (3 rows, 4 columns, 2.5 seconds), 4x3 Cabrera, 4x3 Median Complexes, 2x6 fax only (6 rows, 2 columns, 5 seconds).

Two configurable Custom Lead Groups for 3 Lead strip chart reports.

**GE Medical Systems 12SL Analysis Algorithm:** Interpretive Statements (configurable - ON/OFF), Global ECG Measurements, 12-Lead Measurements Matrix (configurable-ON/OFF).

**Fax Transmission:** Group 3 Facsimile, 24 Preprogrammed Phone Numbers (each with 20 digits), Manual Dial Option, Pulse/Tone Option, Cellular phone-compatible modem, 11-Digit Alphanumeric Site and Device Identifier.

**Patient Demographics:** Patient Name, Patient ID (automatically generated or manually entered), Age, Gender.

#### Pacemaker (Pacer Version Only)

**Type:** VVI demand; asynchronous (fixed rate) when used without ECG leads or in ASYNC pacing mode.

**Pulse:** Rectilinear, constant current; 40 milliseconds ± 2 amplitude variable 0 to 140 mA ± 5% or 5 mA, whichever is greater; digitally displayed on the monitor (increments or decrements by a value of 2 mA); rate variable from 30 to 180 ppm ± 1.5% (increments or decrements by a value of 2 ppm).

**Output Protection:** Fully defibrillator protected and isolated.

**Multi-Function Electrode (MFE) Pads:** Specifically designed pre-gelled ZOLL stat-pad™, pro-pad™ and pedi-pad™ MFE packaged in pairs.

#### Recorder

**Paper:** 80 mm thermal (grid width), 90 mm (paper width).

**Speed:** 25 mm/sec, 6-second delay.

**Annotations:** Time, date, defib energy, heart rate, pacer output (pacer version only), QRS sync marker, ECG size, lead, alarm, defib test OK/Fail, analyze ECG, analysis halted, noisy ECG, shock advised, no shock advised, ECG too large, ECG too small, and diagnostic bandwidth.



Standard printout includes 4 x 3 ECG, patient data, interpretation and optional measurements.

**Printing Method:** High-resolution, thermal array print head.

**Printout Modes:** Manual or automatic - user-configurable.

**On/Off Control:** Front panel and paddle.

**Automatic Function:** 15-second recording initiated by alarm activation or defibrillator discharge.

#### PCMCIA Card Slots

Accepts a standard series Type II Flash Card, 1-16 MB slot 1: Fax modem card capability in slot 2.

#### PCMCIA Card

Records continuous ECG and device data; optionally records digitally compressed audio data;\* play on PC with specified card reader and ZOLL Data Control™

#### Battery Packs

**Type:** Rechargeable, sealed lead acid.

**Recharge Time:** 4 hours or less with integral charger.

**Operating Time:** For a new, fully charged battery pack at 20° C: 35 defibrillator discharges at maximum energy, or 3 hours of continuous ECG monitoring, or 2.5 hours of continuous ECG monitoring/pacing at 60 mA, 80 beats/min. Additional parameters will effect operating time. Consult your operator's guide.

#### General

**Size:** 6.8 in (17.3 cm) high x 10.3 in (26.2 cm) wide x 8.2 in (20.8 cm) deep.

**NIBP Size:** 8.25 in (20.96 cm) high x 10.3 in (26.2 cm) wide x 8.2 in (20.8 cm) deep.

**Weight:** 11.5 lb (5.23 kg) with Universal Cable and battery; 13.5 lb (6.14 kg) with paddles.

**NIBP Weight:** 16.3 lbs. (7.39 kg) with paddles and battery; 14.5 lbs. (6.58 kg) NIBP and battery only.

**Design Standards:** Meets or exceeds UL 2601, AAMI DF-39, AAMI DF-2, and IEC 601-2-4.

**Patient Safety:** All patient connections are electrically isolated.

**Environmental:** Operating Temperature: 0° to 55° C; Storage and Shipping Temperature: -40° to 65° C; Humidity: 5 to 95% relative humidity, non-condensing; Vibration: Mil Std 810E, Minimum Integrity Test; Shock: IEC 68-2-27, 50 g 6ms half sine; Operating Pressure: 594 to 1060 mBar; Material Ingress: IEC 529, IP23; Electromagnetic Compatibility (EMC): CISPR, I1 Class B Radiated and Conducted Emissions; Electro-magnetic Immunity: AAMI DF-2; IEC 801-3 to 20 V/m; Electrostatic Discharge: AAMI DF-2; IEC 1000-4-2, Conducted Susceptibility: IEC 1000-4-4, 1000-4-5, 1000-4-6.

**AC Power:** Meets all IEC, UL, and AAMI safety requirements.

**Options:** Xtreme Pack™ I Carry Case, Xtreme Pack™ II Durable Rubber Case for added protection.

\*Not available on all units

\*\*MUSE system compatibility revisions 4B and higher.

Specifications subject to change without notice.  
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