

# M Series CCT

## M Series CCT Specifications

### Defibrillator

Waveform: ZOLL Rectilinear Biphasic.

Energy Selection: Selectable at 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 15, 20, 30, 50, 75, 100, 120, 150, 200 joules. (Delivered into 50 ohm load.)

Charge Time: Less than 6 seconds with a new fully charged battery (first 15 charges to 200J.) 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.

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

Paddles: External anterior/anterior adult and pediatric.

Adult paddles slide off to expose pediatric paddles.

Multi-Function Electrode (MFE) Pads: Specifically designed adult anterior/posterior pre-gelled ZOLL MFE Pads, and Multi-Function stat•padz™ 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  $\mu$ V and wide complex ventricular tachycardia with rates greater than 150 bpm.

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

### Display

Screen Type: Color LCD.

Screen Size: 6.5 inches (16.5 cm) diagonally.

Sweep Speed: 25 mm/sec.

Viewing Time: 4 seconds.

Traces: 3.

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

### ECG Monitoring

Patient Connection: 3-lead ECG cable, 5-lead ECG cable, 12 lead cable, paddles or MFE Pads. Input selection on front panel.

Input Protection: Fully defibrillator protected. Special circuit prevents distortion of ECG by pacer 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) standard/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  $\pm$  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.

### Recorder

Paper: 90 mm (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.

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 two standard series Type II Flash Cards, 1-16 MB; Fax modem card capability in slot 2.

### PCMCIA Card

Continuous recording of ECG, vital sign and device data; episodic recording of NIBP data. Playback on PC equipped with ZOLL Data Control and specified PCMCIA Card reader.

### Battery Packs

Type: Rechargeable, sealed lead acid.

Recharge Time: 7.2 hours or less with integral charger.

Operating Time: For a new, fully charged battery pack at 20°C: 40 defibrillator discharges at maximum energy (200 joules); 2.5 hours continuous ECG and SpO<sub>2</sub> monitoring; 2.3 hours of continuous ECG with pacing (60 mA at 80 bpm) and SpO<sub>2</sub> monitoring, or 1.5 hours of continuous ECG with pacing (60 mA at 80 bpm) SpO<sub>2</sub> monitoring, EtCO<sub>2</sub>, and IBP monitoring.

### Pulse Oximetry

Saturation (% SpO<sub>2</sub>) Range: 1%-100%.

Pulse Rate (bpm) Range: 25-240.

Saturation (% SpO<sub>2</sub>) Accuracy During No Motion Conditions: Adults - 70%-100%  $\pm$  2 digits, 0%-69% unspecified; Neonates - 70%-100%  $\pm$  3 digits, 0%-69% unspecified.

Saturation (% SpO<sub>2</sub>) Accuracy During Motion Conditions: Adults - 70%-100%  $\pm$  3 digits, 0%-69% unspecified.

Pulse (bpm) Accuracy During No Motion Conditions: 25 to 240  $\pm$  3 digits.

Pulse (bpm) Accuracy During Motion Conditions: 25 to 240  $\pm$  5 digits.

Saturation (% SpO<sub>2</sub>) Resolution: 1%.

Pulse Rate (bpm) Resolution: 1.

Bio-Compatibility: Patient contacting material meets requirements of ISO 10993-1, Biological Evaluation of Medical Device - Part 1, for external devices, intact surfaces and short-term exposure.

Note: The M Series Pulse Oximetry Option is calibrated for functional saturation.

### Pacemaker (Option)

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

Pulse: Rectilinear, constant current; 40 milliseconds  $\pm$  2ms; amplitude variable 0 to 140 mA  $\pm$  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  $\pm$  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•padz™, pro-padz™ and pedi-padz™ MFE packaged in pairs.

### EtCO<sub>2</sub> (Option)

Sensor Type: Infrared, Mainstream.

Warm-Up Time: Operational in 15 seconds, full specification within 60 seconds.

Step Response Time: Less than 60 ms adult, less than 50 ms neonate.

End Tidal CO<sub>2</sub> (EtCO<sub>2</sub>) Range: 0-100 mmHg.

End Tidal CO<sub>2</sub> (EtCO<sub>2</sub>) Accuracy: 0-40 mmHg  $\pm$  2 mmHg, 41-70 mmHg  $\pm$  5%, 71-100 mmHg  $\pm$  8%.

End Tidal CO<sub>2</sub> (EtCO<sub>2</sub>) Resolution: 1 mmHg.

Respiration Rate (RR) Range: 0-150 respirations per minute.

Respiration Rate (RR) Resolution: 1 respiration/min.

EtCO<sub>2</sub> Alarm Limits: User-selectable/High 5 to 100 mmHg, Low 0 to 95 mmHg/OFF.

Respiration Rate (RR) Alarm Limits: User-selectable, High 5 to 150 respirations per minute, Low 0 to 100 respirations per minute/OFF.

O<sub>2</sub>/N<sub>2</sub>O Compensation: User-configurable.

Halogenated Agents: Specification allows for halogenated anesthetic agents, which may be present at normal clinical levels. The presence of desflurane in the exhaled breath beyond normal values (5-6%) may positively bias Carbon Dioxide values by up to an additional 2-3 mmHg.

Barometric Pressure Compensation Range: 550-780 mmHg (automatic).

Airway Adapter Deadspace: Adult < 5 cc, Neonate < 5 cc.

Environmental:

Operating Temperature: 10° to 40°C.

Storage and Shipping Temperature: -10° to 55°C.

Electromagnetic Immunity: (EtCO<sub>2</sub> Option): AAMI DF-2: IEC 1000-4-3, 15 V/m.

### NIBP (Option)

Characteristics and Specifications

Patient Population: Adult, Pediatric.

Method: Oscillometric.

Control: Automatic and manual measurements.

Auto Intervals: 2.5, 3-10, 15, 20, 30, 45, 60, 90, 120 min.

STAT Mode: Maximum number of measurements in 5 minutes, not to exceed 10.

Displayed Pressures: Systolic, Diastolic, Mean.

Displayed Units: mmHg, kPa.

Systolic Range: 40 to 260 mmHg.

Diastolic Range: 25 to 200 mmHg.

Mean Range: 30 to 220 mmHg.

Pressure Transducer Accuracy:  $\pm$  3 mmHg.

Redundant Circuit Overpressure Limit: 300 mmHg.

Pulse Rate Range: 40 to 200 bpm.

Typical Measurement Time: 30 seconds.

### 12-lead ECG and MUSE Interface (Option)

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 Printing Formats Supported: 4x3 (3 rows, 4 columns, 2.5-10 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.

IBP (Option)

Number of Channels: 2

Transducer Requirements:

Excitation Voltage: 2.5 V dc.

Transducer Output: 5 $\mu$ V/V/mmHg.

Input Impedance: minimum 250 ohms.

Output Impedance: maximum 3000 ohms.

Pressure Range: -50 to 300 mmHg.

Offset Range:  $\pm$  225 mmHg.

Accuracy: Greater  $\pm$  2% measurement or,  $\pm$  2 mmHg, not including transducer.

IBP Safety: per EN60601-2-34.

Temperature (Option)

Number of Channels: 2.

Probe Requirement: YSI 400 compatible.

Temperature Measurement Range: 15 to 45°C.

Resolution:  $\pm$  0.05°C, not including sensor.

General

Size: 10.2 in (25.9 cm) high x 10.2 in (25.9 cm) wide x 8.6 in (21.8 cm) deep.

Weight: 17.2 lb. (7.82 kg) with Multi-Function Cable and battery; 18.4 lb. (8.36 kg) with paddles and battery.

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 50°C; Storage and Shipping Temperature: -20° to 60°C; Humidity: 5 to 95% relative humidity, non-condensing; Vibration: Mil Std 810E, Minimum Integrity Test; Shock: IEC 68-2-27, 50g 6ms half sine; Operating Pressure: 594 to 1060 mBar; Material Ingress: IEC 529, IP23; Electromagnetic Compatibility (EMC): CISPR; 11 Class B Radiated and Conducted Emissions; Electromagnetic 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: Xireme Pack™ I Carry Case

Xireme Pack™ II Durable Rubber Case for added protection.

Specifications subject to change without notice.

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# M Series CCT

## The Only Defibrillator You Will Want for Critical Care Transport

## Clinically Superior Resuscitation Therapy



## Invasive and Non-invasive Vital Signs Assessment



# ZOLL

It's about time.

# ZOLL

It's about time.

## ZOLL Defibrillation: Clinically Superior Resuscitation Therapy

### Superior Defibrillation

Only the ZOLL Rectilinear Biphasic™ waveform has proven its clinical superiority for defibrillating VF in high-impedance patients and cardioverting AF patients.<sup>1,2</sup> It reduces the myocardium's exposure to high peak current and maintains an optimal waveform shape over a wide range of patient variability—enhancing efficacy while reducing the risks of inappropriate currents.

### Superior Pacing

Clinical studies<sup>3</sup> have confirmed superior capture rates, lower mean capture thresholds, less muscle artifact and better patient tolerance. ZOLL's constant current, 40-msec pulse overcomes disadvantages inherent in other external pacemakers.



### Advisory Capability

The new ZOLL CCT has advisory capabilities to guide less experienced personnel safely and efficiently through defibrillation. ECG displays, optional voice prompts, auto reanalyze, energy levels and many other features can be individually configured to adapt to all skill levels.

### References

- Mittal S, Ayati S, Stein KM, Knight BP, Morady F, Schwartzman D, Cavlovich D, Platia EV, Calkins H, Tchou PJ, Miller JM, Wharton JM, Sung RJ, Slotwiner DJ, Markowitz SM, Lerman BB. Comparison of a novel rectilinear biphasic waveform with a damped sine wave monophasic waveform for transthoracic ventricular defibrillation. *Journal of the American College of Cardiology*, 1999; 35:4.
- Mittal S, Ayati S, Stein KM, Schwartzman D, Cavlovich D, Tchou PJ, Markowitz SM, Slotwiner DJ, Scheiner MA, Lerman BB. Transthoracic cardioversion of atrial fibrillation: Comparison of rectilinear biphasic versus damped sine wave monophasic shocks. *Circulation*, 2000; 101:1282-1287.
- Clinical studies on file.

## What Makes a Defibrillator Better for Transport?

### Superior Care and Portability in One Compact Unit

When you're transporting critical care patients, defibrillation is a capability you need to have on hand. But you also need to keep track of crucial vital signs along the way. The M Series CCT brings together ZOLL's superior biphasic defibrillation, external pacing, complete monitoring, multiple application printer and a large full-color display—in a single portable unit.

### ZOLL XL Battery for Longer Transport Times

The XL Battery delivers the runtime required for long, portable operation. Built-in AC mains power makes transportation from crashcart to bedside or helicopter to ambulance easy.



### Transport-Ready Design

For transport needs, the M Series CCT is the most efficient, most complete solution. The M Series CCT stays out of the way until you need it. And at just 17 pounds (including the battery), it's smaller and 21% lighter than its nearest competitor.

### Easy-to-Read Display

The bright, 6.5" diagonal color display makes monitoring information easy to read at a glance, whether you're rushing down a hallway or working in a helicopter.

### M Series Technology and Simplicity

The M Series CCT is the newest member of the ZOLL family of familiar, easy-to-operate defibrillators. With its straightforward controls and ZOLL Uniform Operating System, the M Series CCT reduces staff training and minimizes operator confusion. It is the perfect combination for critical care transport and advanced life support.



### TRANSPORT DEFIBRILLATOR

- Small and Lightweight
- Superior Defibrillation
- Superior Pacing
- Multi-parameter Vitals Monitoring
- Easy-to-Read Display
- Extended Runtime

## Vital Signs Assessment: Invasive and Non-invasive Parameters

### A Full Range of Parameters For a Full Range of Patients

The M Series CCT features a three-channel display for ECG and up to two invasive pressures with ranges covering arterial, pulmonary arterial, central venous or intracranial pressure as well as two temperature channels. Of course, it also provides you all the non-invasive parameter options of the M Series including SpO<sub>2</sub>, EtCO<sub>2</sub>, NIBP and fully interpretive 12-lead ECG.



### Flexible Color Display

The color display shows multiple vital signs in different colors in three different channels—organizing information so you can quickly assess your patient's status while on the move.

### Quick, Easy Connections

A VGA output connects the defibrillator to standard displays. It's also compatible with most common IBP transducers and temperature probes.



### Ready to Gather and Share Critical Data

The M Series CCT is compatible with ZOLL Data Control for seamless transfer of patient information, including code summary data, via PC card or RS232 upload.

**ZOLL**  
It's about time.