

QED 6 Series

Defibrillator/External Pacer Analyzer

Technical Data



The QED 6 Series provides a scalable solution to accurately test defibrillators and external, noninvasive pacemakers. Lightweight and portable, the QED 6_M and QED 6_H measure a wide range of defibrillator energy output parameters and conduct ECG elective cardioversion synchronization tests.

Both models in the QED 6 series have 28 automatic sequences to test defibrillator performance to the user's protocol and can test the automatic external defibrillators' ability to recognize critical arrhythmias. An RS232 serial port supports remote computer control and online test documentation via a compatible printer.

The QED 6_H also analyzes energy and timing of noninvasive, external pacemakers, making it a convenient, dual-purpose testing tool.

Key Features

QED 6_M Defibrillator Analyzer

- Monophasic and biphasic DC energy measurement
- Energy and cardioversion measurement
- Peak voltage, peak current, and overshoot measurement
- 5-lead ECG simulation
- Charge time measurement
- ECG normal, performance, and arrhythmia simulation
- 2-line x 24-character display
- Bidirectional RS232 port for computer control
- 28 user-programmable autosequences
- Storage and playback of output waveform so results can be viewed in greater detail

QED 6_H Defibrillator and Pacemaker Analyzer

The QED 6_H Defibrillator and Pacemaker Analyzer has all the features of the QED 6_M Defibrillator Analyzer plus the following testing features for noninvasive, external pacemakers

- Amplitude (mA and V), rate, and pulse width measurement
- Sensed and paced refractory period tests
- Peak voltage and current measurement
- Built-in pacemaker test load of 50 Ω
- External pacemaker test loads of 50 Ω to 1,500 Ω with plug-in load adapter (PLA)

Technical Specifications

Output Energy Test

Load: $50 \Omega \pm 1\%$, with inductance $< 70 \mu\text{H}$
Resolution: High-range: 1 J; low-range: 0.1 J
Low-Range: 0 J to 100 J
High-Range: 0 J to 1000 J
Pulse Width: 1 ms to 50 ms
Maximum Current: Low: 35 A; high: 110 A
Maximum Voltage: Low: 1750 V; high: 5500 V
Minimum Voltage: Low: 20 V; high: 66 V
Accuracy: 1000 J Range: $\pm 2\%$ of reading;
100 J to 1000 J: $\pm 2\%$ J; 100 J Range: $\pm 2\%$ of
reading, ± 0.1 J
Waveform Storage: Discharge viewable via ECG
output, paddles, and scope output
Time Expansion Lead II Amplitude: High = 3000
V / mV; low = 900 V / mV

Peak/Overshoot

Voltage Accuracy: 1000 J Range: ± 10 V; 100 J
Range: ± 25 V
Current Accuracy: ± 1 A

Cardioversion Synchronization Test

Measurement from peak or base of simulated R-
wave: 0 ms to 199.9 ms
Accuracy: 1 % of full scale or ± 2 ms, whichever
is greater

External Noninvasive Pacer Measurements (QED 6_H)

Load: $50 \Omega \pm 1\%$
R-Wave Amplitude: 1.1 mV $\pm 10\%$ (Apex-
Sternum); 1 mV $\pm 2\%$ lead II (RA-LL)
Pulse Width: 1 ms to 50 ms
Peak Voltage: 0 V to 12.5 V
Peak Current: 4 mA to 250 mA < 4 mA = 0 mA
Rate: 25 PPM to 400 PPM < 25 PPM = 0 PPM
Refractory period: 110 ms to 500 ms < 110 ms =
110 ms, sensed; 70 ms to 500 ms < 70 ms =
70 ms, pulsed
Accuracy: $\pm 2\%$ of full-scale for pulse width,
peak voltage, current; $\pm 1\%$ of full scale for rate
and refractory period measurements

ECG Waveforms

Normal Sinus Rhythm (NSR)

Rates: 30, 60, 120, 180 and 240 BPM
Rate Accuracy: $\pm 1\%$ of setting
Amplitude: Fixed at 1 mV lead II (RA-LL); fixed at
1.1 mV (Apex-Sternum)
Amplitude accuracy: $\pm 2\%$ (RA-LL); $\pm 10\%$
(Apex-Sternum)

Performance Waveforms

Pulse: 30 BPM, 60 BPM, 60 ms pulse width
Sine Wave: 10, 40, 50, 60 and 100 Hz
Square Wave: 0.125 Hz, 2 Hz (50 % duty cycle)
Triangle: 2 Hz (4 mV)
Time Base Accuracy: $\pm 1\%$ of setting
Amplitude: Fixed at 1 mV lead II (RA-LL); triangle
wave 2 mV lead II (RA-LL); fixed at 1.1 mV (Apex-
Sternum); amplitude accuracy: $\pm 2\%$ (RA-LL); $\pm 10\%$
(Apex-Sternum)

Defib Waveform Playback

Time Base Expansion: 100:1 @ 25 mm/s paper
speed, each division equals 40 ms
Amplitude Scaling: Lead II (RA-LL); 1000 J
Range: 1 mV = 3000 V; 100 J Range:
1 mV = 900 V

ECG Output: 1000 J Range: 0.5 V = 3000 V;
100 J Range: 0.5 V = 900 V

Arrhythmias

Asystole, atrial fibrillation; atrial flutter;
atrial tachycardia; idioventricular; PVC;
R on T; RUN PVC; ventricular fibrillation;
ventricular tachycardia, 125 BPM
monomorphic; ventricular tachycardia, 340
BPM monomorphic; ventricular tachycardia,
300 BPM polymorphic
Rate Accuracy: $\pm 1\%$
Amplitude: Fixed at 1 mV lead II (RA-LL);
fixed at 1.1 mV (Apex-Sternum)
Amplitude Accuracy: ± 2 (RA-LL); $\pm 10\%$
(Apex-Sternum)

Scope Outputs

ECG hi-level: fixed at 1 V
Accuracy: $\pm 2\%$
Defib Output: Real time
Pacer Range: 1 V = 3.11 V; 1000 J Range: 1
V = 1450 V; 100 J Range: 1 V = 440 V
Amplitude Accuracy: $\pm 2\%$ of scale
Waveform Output: 5 ECG lead adapters,
front-panel paddles, and high-level scope
output

Calibration Screen

Load: $50 \Omega \pm 1\%$ (Apex-Sternum)
Amplitude Scaling: Apex (+) to sternum (-)
Pacer Range: 318 counts/V; 1000 J range:
0.683 counts/V; 100 J range: 2.252 counts/V
Accuracy: ± 15 counts
Zero Voltage Input: 0 ± 2 counts

RS232 Output / Computer Control

Note: Computer control allows the user to
operate the QED 6 remotely via a serial
RS232 interface. It requires an RS232 cable
and a bidirectional D-9 connector

Selectable Communications parameters

Baud Rate: 300, 600, 1200, 2400,
and 9600
Parity: None, even, odd
Stop Bits: 1 or 2
Data Bits: 7 or 8

Environmental Requirements

Storage Temperature: -25°C to 50°C
Operating Temperature: 0°C to 40°C
Maximum Humidity: 90 % relative humidity

General Information

Display: 2-line x 24-character super twist LCD
Power: One 9 V Alkaline battery or 9 V battery
eliminator; 12 hours continuous operation; low-
battery indication; 120/240 V battery eliminator
input
Dimensions: 10.5 in L x 9.5 in W x 4.0 in H
(26.67 cm L x 24.13 cm W x 10.16 cm H)
Weight: 4.54 lb (2.06 kg)

Ordering Information

Model

2251478: QED 6_M Defibrillator Analyzer

2251469: QED 6_H Defibrillator &
Transcutaneous Pacemaker
Analyzer

Standard Accessories

2204510: User/service manual

2204198: Internal paddle discharge contact
adapters (two each)

QED 6_H only

2393250: Pacer load adapter 50 Ω to 1500 Ω

Optional Accessories

2204282: Soft-sided vinyl carrying case

2527552: Battery eliminator 9 VAC adapter

Interface cables and accessories

2248899: Printer, Seiko DPU-414-30B 120 V
power supply

2399531: Printer, Seiko DPU-414-30B 220 V
power supply

2235375: Printer, 120 V power supply

2235382: Printer, 220 V power supply

2248737: Printer paper (7 rolls min, priced
per individual roll)

2204472: Serial cable D9F-D9F

2391907: Printer cable DPU 411

2204485: Serial printer cable DPU 414, DB9F
to DB9F

2393250: Pacer load adapter 50 Ω to 1000 Ω

Defibrillator & transcutaneous pacemaker electrode adapters

Note: Refer to your sales representative or
directly to Fluke Biomedical for most current
listing of available adapters.

2200125: Agilent/HP: Codemaster XL + series
(inline round connector included
[Defib and Pace])

2200687: Agilent/Philips: HEARTSTREAM FR2,
XL AND XLT series (inline rectangular
connector [defib and pace])

2392362: GE-Marquette: Responder series (snap
connector included; two adapters
required [DEFIB & PACE])

2392396: Laerdal: HEARTSTART
/SpaceLabs: FIRST MEDIC (early
series) round snap connector
included; two adapters required

2199354: MDE (Medical Data Electronics:
All) (inline R2/Darox connector
included [DEFIB & PACE])

2392249: Medtronic Physio-Control LifePak
series: QUIK COMBO (inline
connector included [defib and
pace])

2392355: Medtronic Physio-Control LifePak
series: FAST PATCH (snap
connector included; two
adapters required [defib only])

2230648: Medtronic Physio-Control
LifePak series: QUIK PACE (snap
connector included; two
adapters required [pace only])

2199354: MRL (Medical Research
Laboratories): PIC system, PIC Lite
and LifeQuest (inline R2-Darox
connector included [defib and
pace])

2199758: Zoll Medical PD series, M series, M
series CCT and AED Plus™
(Testing the AED Plus™ requires
the purchase of an additional
auxiliary adapter directly from
Zoll Medical (Zoll Medical model:
8000-0804-01))

2200140: Zoll Medical NTP and PD1400
(inline connector included [pace
only])

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About Fluke Biomedical

Fluke Biomedical is the world's leading manufacturer of quality biomedical test and simulation products. In addition, Fluke Biomedical provides the latest medical imaging and oncology quality-assurance solutions for regulatory compliance.

Today, biomedical personnel must meet the increasing regulatory pressures, higher quality standards, and rapid technological growth, while performing their work faster and more efficiently than ever. Fluke Biomedical provides a diverse range of software and hardware tools to meet today's challenges.

Fluke Biomedical Regulatory Commitment

As a medical device manufacturer, we recognize and follow certain quality standards and certifications when developing our products. We are ISO 9001 certified and our products are:

- FDA Compliant
- CE Certified, where required
- NIST Traceable and Calibrated
- UL, CSA, ETL Certified, where required

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Better products. More choices. One company.

Fluke Biomedical

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