

Impulse 6000D/7000DP

Pacemaker Analyzer



The Impulse 6000D Defibrillator Analyzer and Impulse 7000DP Defibrillator/Transcutaneous Pacemaker Analyzer Test Systems are rugged, portable precision test instruments that ensure proper operation and ultimate performance of critical life-support cardiac-resuscitation equipment. The Impulse 6000D and Impulse 7000DP test capabilities encompass the spectrum

of worldwide-established pulse shapes, showcase breakthrough AED technology compatibility, and outperform in accuracy and standards. Additionally, the Impulse 7000DP incorporates the tests and the extensive range of test loads and measurement algorithms needed to test external transcutaneous pacemakers.

In conjunction with an Impulse 7000DP, the Impulse 7010 Defibrillator Selectable Load Accessory provides multiple loads of 25 Ω, 50 Ω, 75 Ω, 100 Ω, 125 Ω, 150 Ω, 175 Ω, and 200 Ω for defibrillator performance testing. A standard USB interface enables computer control and data transfer, and optional Ansur PC-based automation software increases productivity by outfitting users with an easy-to-use method to standardize testing procedures and capture, print and document data.



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Key features

- Impulse 7010 Defibrillator Selectable Load Accessory provides multiple loads of 25 Ω, 50 Ω, 75 Ω, 100 Ω, 125 Ω, 150 Ω, 175 Ω, and 200 Ω to comply with IEC 60601-2-4 standard (optional)
- Lown, Edmark, trapezoidal, biphasic and pulsed biphasic defibrillation technology compatibility
- AED technology compatibility
- First-class measurement accuracy: ± 1 % of reading 0.1 J
- Intuitive user interface and backlight, easy-to-ready display
- Portable, rugged, easy to carry
- Long-lasting, rechargeable battery
- Internal pacer brand selections
- Pacer input protected against defibrillator output (7000DP only)
- 10 isolated ECG electrodes that provide 12 combinations for standardized clinical signals
- Flexible heart-rate settings (1 BPM step) facilitate rate meter accuracy and alarm testing
- DSP-based measurements enable future firmware and waveforms upgrade
- Unique integrated posts for secure connections
- Optional Ansur test automation software to standardize testing procedures, capture waveforms, and print and document test result

Product comparison chart

Model	QED 6	Impulse 6000D	Impulse 7000DP
Monophasic and dc biphasic energy capability	Yes	Yes	Yes
Pulsed biphasic energy capability	No	Yes	Yes
Defibrillator tests	Output energy	Output energy	Output energy
	Cardioversion	Cardioversion	Cardioversion
	Peak measurements	Max energy/charge-time overshoot	Max energy/charge-time overshoot
	—	Peak and average current	Peak and average current
—	Voltage measurement	Voltage measurement	
Normal ECG/performance waves	No	Yes	Yes
Transcutaneous pacer tests	No	No	Yes



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Specifications

Defibrillator Analyzer

Energy output measurement	Compatible defibrillator waveshapes: Lown, Edmark, trapezoidal, dc bi-phasic, and ac pulsed bi-phasic
Autoranged measurement	0.1 J to 600 J
Accuracy	0.1 J to 360 J: $\pm 1\%$ of reading +0.1 J 360 J to 600 J: $\pm 1\%$ of reading +0.1 J, typical Note: For pulsed bi-phasic defibrillator, specified accuracy is $\pm (1.5\%$ of reading + 0.3 J) on both ranges
Load resistance	Resistance: 50 Ω
Accuracy	1 %, non-inductive (< 2 μ H)
Charge time measurement	Range: 0.1 s to 100 s Accuracy: ± 0.05 s, typical
Synchronization test (cardioversion)	Delay time measurement
	<ul style="list-style-type: none"> • Timing window: ECG R-wave peak to the defib pulse peak • Range: -120 ms to 380 ms; measures timing from 120 ms prior to the R-wave peak to up to 380 ms following the R-wave peak
	Automated defibrillator test ECG waves
	<ul style="list-style-type: none"> • Normal sinus: 10 BPM to 300 BPM in 1 BPM steps • Ventricular fibrillation: Coarse and fine • Monomorphic ventricular tachycardia: 120 BPM to 300 BPM in 1 BPM steps • Polymorphic ventricular tachycardia: 5 types • Asystole
ECG waves	
ECG general	Lead configuration: 12-lead simulation; RA, LL, LA, RL, V1-6 with independent outputs
Lead to lead impedance	1000 Ω
Rate accuracy	$\pm 1\%$ nominal
ECG amplitudes	Reference lead: Lead II (default) or Lead I Settings: 0.05 mV to 0.45 mV by 0.05 mV and 0.5 mV to 5 mV by 0.05 mV Accuracy: $\pm 2\%$ of setting (Lead II), $\pm 5\%$ for all other leads and defib paddles
ECG normal sinus	Rates: 10 BPM to 360 BPM in 1 BPM steps
ECG on defibrillator input load	Same as the Lead II amplitude but limited to ± 4 mV
ECG performance waves	Square wave: 2 Hz and 0.125 Hz Triangular wave: 2 Hz and 2.5 Hz Sine waves: 0.05 Hz, 0.5 Hz, 5 Hz, 10 Hz, 40 Hz, 50 Hz, 60 Hz, 100 Hz, 150 Hz, and 200 Hz Pulse: 30 BPM and 60 BPM, 60 ms pulse width
R-wave detection	Waveform: Haver-triangle Rate: 30 BPM, 60 BPM, 80 BPM, 120 BPM, 200 BPM, and 250 BPM Widths: 8 ms, 10 ms, 12 ms, and 20 ms to 200 ms in 10 ms steps Accuracy: $\pm 1\%$ setting 0.2 mV
Noise immunity	Wave sine Line frequency: 50 Hz or 60 Hz (± 0.5 Hz) Amplitude: 0 mV to 10 mV (by 0.5 mV $\pm 5\%$)
Arrhythmia selections	Pacer interactive (Impulse 7000DP only) Supraventricular Premature Ventricular Conduction Transvenous paced with selectable pacer spike amplitudes and widths



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Transcutaneous Pacemaker Analyzer (Impulse 7000DP only)

Defibrillator input	Fixed load: 50 Ω Accuracy: ± 1 %, non-inductive (< 2 μH)
Pacemaker input	Variable load: 50 Ω to 1500 Ω by 50 Ω Accuracy: ± 1 %, non-inductive (< 2 μH)
Manufacturer specific algorithms	<ul style="list-style-type: none"> • Medtronic/Physio Control LIFEPAK • Philips/Agilent/HP • ZOLL Medical • GE Responder (1500 and 1700) • MRL/Welch Allyn • Schiller Medical • MDE300 (Medical Data Electronics), plus a general purpose default algorithm selection
Current	Range: 4 mA to 250 mA Accuracy: ± 1 % of reading +0.02 mA
Pulse rate	Range: 5 PPM to 800 PPM Accuracy: ± 0.5 % of reading +0.1 PPM
Pulse width	Range: 1 ms to 100 ms Accuracy: ± 0.5 % of reading +0.01 ms
Demand and asynchronous mode test	Underdrive rate: 10 BPM minimum Overdrive rate: 300 BPM maximum
Sensitivity test	Automatic interactive threshold detection
	Compatible pacer rates: 30 PPM to 120 PPM
	ECG R wave
	Waveforms: Square, triangle, sine
	Widths: 1 ms to 19 ms (by 1 ms), 20 ms to 95 ms (by 5 ms), 100 ms to 300 ms (by 25 ms)
	Accuracy: ± 5 % of setting
	Amplitude: 0.05 mV to 0.95 mV (by 0.05 mV), 1 mV to 5 mV (by 0.5 mV)
	Accuracy: ± 5 % of setting
Refractory period tests	Paced refractory period 20 ms to 500 ms Sensed refractory period 15 ms to 500 ms Accuracy: ± 1 ms

General information

Dimensions (LxWxH)	32 cm x 24 cm x 13 cm (13 in x 9.5 in x 5 in)
Weight	3.02 kg (6.6 lb)

Standards

Safety standards	CE: IEC/EN61010-1 2nd Edition; Pollution degree 2; CSA: CAN/CSA-C22.2 NO,61010-1, UL61010-1; C-Tick: Australian EMC
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Optional accessories

- 3091370** Ansur Impulse 6000D/7000DP Plug-In
- 3065489** MedtronicERS/Physio-Control (FAST PATCH) (set of two): 4 mm defibrillator adapters
- 3065450** Kimberly Clark/R2 Darox MRL/MDE/NK: 4 mm defibrillator adapters
- 3065438** Internal discharge paddle contacts (set of two)
- 3065477** Medtronic ERS/Physio-Control (QUIK PACE) (set of two): 4 mm pacer adapters
- 3065527** Zoll Medical NTP/PD1400: 4 mm pacer adapters
- 3065461** Medtronic ERS/Physio-Control (QUIK COMBO): 4 mm defib/pacer adapters
- 3065492** Philips/Agilent/HP (CODEMASTER Series-Round): 4 mm defib/pacer adapters
- 3065509** Philips/Agilent HEARTSTART FR2/MRX: 4 mm defib/pacer adapters
- 3065511** Zoll PD-2200 Multi-Function PD-Series, M-Series, M-Series CCT, AED PRO® and AED Plus™ defib/pacer adapters
- 3065423** GE Marquette (RESPONDER 1500/1700 Series) (set of two): 4 mm defib/pacer adapters
- 3158544** Impulse 7010 Defibrillator Selectable Load Accessory

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Impulse 7010 Defibrillator Selectable Load Accessory

Maximum voltage	5000 V
Maximum continuous power	12 W, equivalent to 10 defib pulses of 360 J every 5 minutes
Inductance	< 2 µH, @25 Ω < 3 µH, @50 Ω < 4 µH, @75 Ω and 100 Ω < 5 µH, @125 Ω < 6 µH, @150 Ω < 7 µH, @175 Ω < 8 µH, @200 Ω
Temperature	Operating: 10 °C to 40 °C (50 °F to 104 °F) Storage: -20 °C to 60 °C (-4 °F to 140 °F)
Humidity	10 % to 90 % non-condensing
Dimensions (WxDxH)	154 mm x 272 mm x 138.7 mm (6.07 in x 10.71 in x 5.46 in)
Weight (net)	1.54 kg (3 lb 6.2 oz)
Safety class	Complies with EN61010-1 2nd Edition, Class II product
Safety standards	CE: IEC/EN61010-1 2nd Edition; Pollution degree 2; CSA: CAN/CSA-C22.2 NO,61010-1, UL61010-1; C-Tick: Australian EMC
Warranty	Two-year extended warranty (no-cost extended warranty available after first-year calibration at any Fluke Biomedical authorized service center)
Calibration interval	One-year
Electrical specifications (for load accessory and analyzer together)	
Load settings	25 Ω, 50 Ω, 75 Ω, 100 Ω, 125 Ω, 150 Ω, 175 Ω, and 200 Ω ± 1 %
Accuracy	Energy (all except pulsed biphasic): 2 % of reading + 0.1 J with 25 Ω, 75 Ω though 200 Ω loads, 1 % of reading + 0.1 J with 50 Ω load
	Energy (pulsed biphasic): 2.5 % of reading + 0.3 J with 25 Ω, 75 Ω though 200 Ω loads, 1.5 % of reading + 0.3 J with 50 Ω load
	Voltage: 1 % of reading + 2 V with 25 Ω and 50 Ω loads, 2 % of reading + 2 V with 75 Ω through 200 Ω loads
	Current: 2 % of reading + 0.1 A with 25 Ω load, 1 % of reading + 0.1 A with 50 Ω through 200 Ω loads

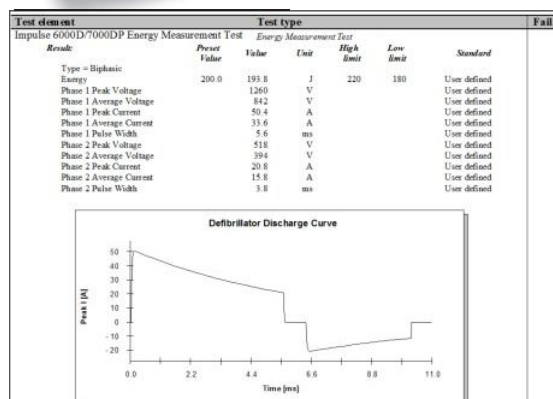


Included accessories

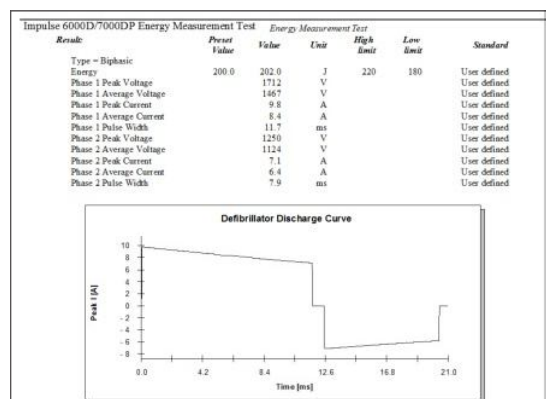
- 3028681 Users Manual CD
- 3028662 Getting Started Guide
- XXXXXXX Battery Eliminator (country specific)
- 2814980 Carrying Case
- 2795773 Defibrillator Paddle Contact Plates
- 1626219 USB Computer Communication Cable

Ordering information

- Impulse 6000D Defibrillator Analyzer**
- 2811928 United States, 120 V
 - 3077031 Schuko
 - 3077046 United Kingdom
 - 3077054 Japan
 - 3085270 Australia
 - 3085281 India
- Impulse 7000DP Defibrillator/Transcutaneous Pacemaker Analyzer**
- 2811919 United States, 120 V
 - 3077005 Schuko
 - 3077010 United Kingdom
 - 3077022 Japan
 - 3085296 Australia
 - 3085308 India
- Impulse 7000DP Defibrillator/Transcutaneous Pacemaker Analyzer with test automation**
- 3326874 United States, 120 V
 - 3326888 Schuko
 - 3326895 United Kingdom
 - 3326901 Japan
 - 3326912 Australia
 - 3326920 India



Discharge curve at 25 Ohms using Ansur and the 7010 load box.



Discharge curve at 175 Ohms using Ansur and the 7010 load box. Note the differences in the shape, the peak currents and the time of the discharges.