

UniPulse 400

An easy to use defibrillator analyzer with pacer.



The new **UniPulse 400** is designed to comprehensively test all defibrillators accurately and efficiently. The large vibrant color screen will display both test results and waveforms in amazing detail. The dedicated fast keys and simple to use operating system enables biomedical/clinical engineers to select the relevant test function in seconds.

The all new **UniPulse 400** is capable of analyzing all monophasic, biphasic, standard and pulsating waveforms. This unrivaled functionality and our new comprehensive pacer function makes the **UniPulse 400** the ultimate defibrillator analyzer on the market.

The large internal memory and on-board results storage will reduce test time and help work towards a modern paperless system. Download results to "Med-eBase" asset management software via our simple USB function or use the on-screen data recall to review results – it's never been so simple.

The ergonomic enclosure of the **UniPulse 400** makes the unit compact, rugged and lightweight so you can easily move location with this portable product. Our handy Rigel carry case can fit the unit alongside any additional accessories you may require allowing easy transportation to different sites.

These are just a few of the reasons we believe you'll want to invest in our **UniPulse 400**. To see for yourself, request a live online demonstration today!

To see the new **UniPulse 400** for yourself, request your live online demonstration by emailing sales@rigelmedical.com

T: +1 813-886-2775 E: sales@rigelmedical.com
TESTED, TRUSTED... WORLDWIDE.

Why buy the UniPulse 400 ?

- > **The complete defibrillator analyzer solution** – including pacer functionality.
- > **Clear and vibrant LCD color display with simple navigation** – including dedicated fast keys. Less button pushing. more testing!
- > **Rugged, compact and easy to hold** – take it anywhere, anytime... easily with battery operation.
- > **Compatible with all defibrillators** – accurately measure and display waveforms from monophasic to biphasic, all in a tester that fits in your hand.

 **RIGEL**
From **SEAWARD**

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Key Features:

- > Pacer functionality.
- > Compatible with monophasic, biphasic and pulsed waveforms.
- > Color LCD display.
- > Easy and intuitive navigation with dedicated fast test and simulation keys.
- > Rechargeable battery allowing operation without the need for AC power.
- > Data download via USB to PC.
- > Reliable and non-inductive test load of 50Ω.
- > Patient simulator with ECG hi output.
- > Multi-lingual firmware to meet requirements across the globe.
- > Portable, compact and rugged.
- > Robust carry case to protect your analyzer.

Simulation Functions:

- > Defibrillator Energy Discharge.
- > Charge Time.
- > Cardiac Synchronization.
- > Over 40 selectable Arrhythmias.
- > Performance waveforms.
- > 5 pacer modes.



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Technical Specifications

Defib - Energy Measurement

| | |
|---------------------|-----------------------------|
| Load Resistance | 50Ω ± 1% non-inductive |
| Range | 0 - 199.9 Joules |
| Accuracy | ± 1% of reading ± 0.1 Joule |
| Range (High) | 200 - 600 Joules |
| Accuracy | ± 1% of reading ± 1 Joule |
| Resolution | 0.1 Joules |
| Voltage | 0 - 5000 Volts |
| Current | 0 - 100 Amps |
| Sampling Rate | 250 kHz sampling frequency |
| Maximum pulse width | 5us - 120ms |

AED Pulse Mode Waveforms

| | |
|---|-------------------------------------|
| Normal Sinus Rhythm (NSR) | 20 - 300 BPM, Amplitude 1.00mV(±2%) |
| Asystole (ASYS) | |
| Ventricular Fibrillation - Coarse (VFBC) | 240 BPM, Amplitude 1.00mV(±2%) |
| Ventricular Fibrillation - Fine (VFBF) | 240 BPM, Amplitude 1.00mV(±2%) |
| Monomorphic Ventricular Tachycardia (MVT) | 210 BPM, Amplitude 1.00mV(±2%) |
| Atrial Fibrillation (AFB) | 20 - 300 BPM, Amplitude 1.00mV(±2%) |

ECG Simulator

ECG simulation with hi-level output.

ECG Waveforms - Sinus

| | |
|----------------------------|--|
| Normal Sinus Rhythm (NSR) | 20 - 300 BPM, Amplitude 0.50 - 5.00mV(±2%) |
| ST Elevation (STE) | 20 - 300 BPM, Amplitude 0.50 - 5.00mV(±2%) |
| ST Depression (STD) | 20 - 300 BPM, Amplitude 0.50 - 5.00mV(±2%) |
| Myocardial Infarction (MI) | 20 - 300 BPM, Amplitude 0.50 - 5.00mV(±2%) |
| Tall T (TT) | 20 - 300 BPM, Amplitude 0.50 - 5.00mV(±2%) |
| Asystole (ASYS) | |

ECG Waveforms - Ventricular Arrhythmias

| | |
|--|---------------------------------------|
| Premature Ventricular Contraction - Intermittent (PVC) | 80 BPM, Amplitude 0.50 - 5.00mV(±2%) |
| Bigeminy (BIG) | 80 BPM, Amplitude 0.50 - 5.00mV(±2%) |
| Trigeminy (TRIG) | 80 BPM, Amplitude 0.50 - 5.00mV(±2%) |
| Ventricular Flutter (VFLT) | 240 BPM, Amplitude 0.50 - 5.00mV(±2%) |
| Ventricular Fibrillation - Coarse (VFBC) | 240 BPM, Amplitude 0.50 - 5.00mV(±2%) |
| Ventricular Fibrillation - Fine (VFBF) | 240 BPM, Amplitude 0.50 - 5.00mV(±2%) |
| Monomorphic Ventricular Tachycardia (MVT) | 210 BPM, Amplitude 0.50 - 5.00mV(±2%) |
| Right-focal Premature Ventricular Contraction (RFPVC) | 80 BPM, Amplitude 0.50 - 5.00mV(±2%) |

ECG Waveforms - Atrial Conduction Arrhythmias

| | |
|---|--------------------------------------|
| First Degree AV Block (FAVB) | 80 BPM, Amplitude 0.50 - 5.00mV(±2%) |
| Second Degree AV Block - Mobitz I (SAVB_MI) | 80 BPM, Amplitude 0.50 - 5.00mV(±2%) |
| Second Degree AV Block - Mobitz II (SAVB_MII) | 80 BPM, Amplitude 0.50 - 5.00mV(±2%) |
| Third Degree AV Block (TAVB) | 50 BPM, Amplitude 0.50 - 5.00mV(±2%) |

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ECG Waveforms - Atrial Arrhythmias

| | |
|--|--|
| Sinus Arrhythmia (SAR) | 20 - 300 BPM, Amplitude 0.50 - 5.00mV(±2%) |
| Missing Beat (MB) | 20 - 300 BPM, Amplitude 0.50 - 5.00mV(±2%) |
| Atrial Flutter (AFLT) | 300 BPM, Amplitude 0.50 - 5.00mV(±2%) |
| Atrial Fibrillation (AFB) | 20 - 300 BPM, Amplitude 0.50 - 5.00mV(±2%) |
| Paroxysmal Atrial Tachycardia (PAT) | 180 BPM, Amplitude 0.50 - 5.00mV(±2%) |
| Premature Junctional Contraction (PJC) | 20 - 300 BPM, Amplitude 0.50 - 5.00mV(±2%) |

ECG Pacer Waveforms

| | |
|----------------------------------|---|
| Synchronous Atrial (AAI) | 20 - 300 BPM, Pulse amplitude 0.50 - 5.00mV, Pulse width 0.1 - 2.0ms |
| Asynchronous Atrial (AOO) | 20 - 300 BPM, Pulse amplitude 0.50 - 5.00mV, Pulse width 0.1 - 2.0ms |
| Pacer (PCR) | 20 - 300 BPM, Pulse amplitude 0.50 - 5.00mV, Pulse width 0.1 - 2.0ms |
| Ventricular Pacer (VVI) | 20 - 300 BPM, Pulse amplitude 0.50 - 5.00mV, Pulse width 0.1 - 2.0ms |
| Atrial & Ventricular Pacer (DDD) | 20 - 300 BPM, Pulse amplitude 0.50 - 5.00mV, Pulse width 0.1 - 2.0ms |
| R-Wave Detection (RWD) | 20 - 300 BPM, Pulse amplitude 0.50 - 5.00mV |

ECG Performance Waveforms

| | |
|---------------------------|-----------------------------|
| Sine (SINE) | 0.1 - 300Hz, 1.00 - 10.00mV |
| Square (SQ) | 0.1 - 300Hz, 1.00 - 10.00mV |
| Triangle (TRI) | 0.1 - 300Hz, 1.00 - 10.00mV |
| Sawtooth (SAW) | 0.1 - 300Hz, 1.00 - 10.00mV |
| Inverse Sawtooth (INVSAW) | 0.1 - 300Hz, 1.00 - 10.00mV |
| Pulse (PULSE) | 0.1 - 300Hz, 0.50 - 5.00mV |

ECG Noise Selection

| | |
|-----------|-------------|
| Amplitude | 0 - 10.00mV |
| Frequency | 50 - 60Hz |

ECG Waveform Output

| | |
|-----------|---------------------------|
| Low Level | 5-lead ECG and on Paddles |
| Hi Level | Output Jack |

ECG Accuracy

| | |
|-----------|--|
| Rate | ± 1% |
| Amplitude | ± 2% (LA-LL), ± 10% (Paddles) Lead II : 1 - 10 mV (in steps of 0.5 mV). Other leads are proportional to Lead II by the following percentages: Lead I : 60 % Lead II : 100 % Lead III : 40 % V1 : 63 % [Reference LA] V2 : 71 % [Reference LA] V3 : 68 % [Reference LA] V4 : 80 % [Reference LA] V5 : 55 % [Reference LA] V6 : 49 % [Reference LA] |

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Pacer Input

| | |
|-------------------------|---|
| Fix Load | 50 Ω |
| Accuracy | 1 %, non-inductive |
| Over voltage protection | 5000V |
| Variable Load | 50 to 1600 Ω in 50 Ω steps |
| Accuracy | 1 %, non-inductive |
| Pulse Rate | 5.0 to 800 ppm |
| Accuracy | +/- (0.5% rdg + 0.1ppm) |
| Heart rate selection | 20 - 300 bpm |
| Under & overdrive | 85% (20 bpm min) and 115% (300 bpm max) |
| Wave form selection | NSR, VFibC, VFibF, MVT, AFib, Missing Beat, R-Wave detection |
| Pulse Current Amplitude | 5.00 - 200mA |
| Accuracy | +/- (1% rdg +0.02mA) |
| Current Measurements | Average (RMS), Leading edge, Trailing edge, Peak (the highest during the pulse) |
| Pulse Width | 1.00 - 100ms |
| Accuracy | +/- (0.5% rdg + 0.01ms) |
| Pulse Energy | 1 μ J - 2.00J |
| Accuracy | +/- 4% + 10 μ J |

Pacer Manufacturer Algorithms

CU Medical, GE, HP, Laerdal, Mindray, Philips, PhysioControl, Schiller, WelchAllyn, Zoll

Pacer Refractory Periods

| | |
|------------------------|-------------------------------|
| Refractory Period test | 15 - 500mS (Paced and sensed) |
| Accuracy | +/- 1ms |

Pacer Sensitivity Test

| | |
|---------------------|--|
| Wave form, R Wave | Polarity Normal and Reversed, selectable |
| Dynamic Sensitivity | 0.05mV to 5.00mV in 50 μ V steps |

Pacer Interference Test (Immunity)

| | |
|-------------------|-------------|
| Heart rate | 20-300 bpm |
| Frequency | 50 or 60 Hz |
| Noise level in mV | 0-15.0mV |

General Specifications

| | |
|----------------------------------|--|
| Dimensions | 8.7" x 5.9" x 3.5" (L x W x H) |
| Weight | 3.3lbs |
| Operation | 9.6V/2400mAh Nickel Metal Hydride battery pack |
| Battery charge time | 2.5 hours |
| Battery capacity (fully charged) | 12 hours |
| Mains supply | 110/230V AC; 48 to 66Hz, 35VA power supply |
| Storage environment | 5°F to 140°F |
| Operating conditions | 32°F to 104°F |
| Environmental protection | IP 40 |
| Communication | USB |
| Display | LCD color graphic display ¼" VGA |
| Memory | 100 test results including graphs |
| Impact rating | 5J |

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