

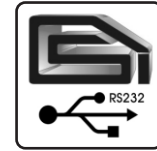


Phase 3

Defibrillator / Transcutaneous Pacer Analyzer



Phase 3 has the required regulatory approvals to give you peace of mind when testing your life-saving defibrillators and transcutaneous pacemakers.



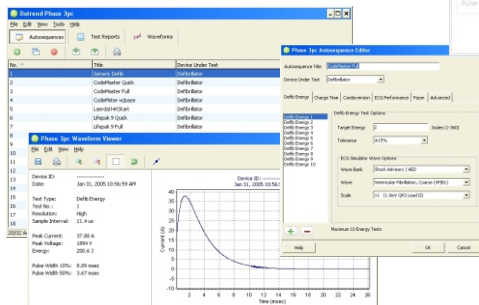
ES601 Plus System Connectivity

Phase 3 is the first Defibrillator / Pacer Analyzer specifically designed to test Pulsed Multiphasic defibrillators, while maintaining 100% compatibility with legacy monophasic and pulsed mode defibrillator outputs. It is also fully compatible with AED's. Phase 3 is one of the most accurate and versatile analyzers on the market today. You'll get better than 1% of reading accuracy from the Phase 3 on either line or battery power. In one of the most portable and rugged packages available (Phase 3 has a rugged aluminum enclosure rather than a plastic one like many competitive instruments), the Phase 3 will provide up to 24 hours of continuous operation from its internal re-chargeable battery. RS232 connectivity on the Phase 3 allows for integration with the ES601 Plus Automated Electrical Safety & Performance Analyzer. USB connectivity facilitates transfer of stored test results, captured defibrillator waveforms, and captured pacer waveforms to the Phase 3pc Utility Software for non ES601 Plus integrated testing applications. Phase 3 has 32 fully customizable internal automated testing "autosequences" on board to facilitate standardized testing according to manufacturer and model, or whatever other criteria you choose. Phase 3 also offers real-time wave capture, which provides high-resolution signal data to a PC running the Phase 3pc software, immediately after discharge. Test results from your defibrillator and transcutaneous pacer testing can be stored to internal memory, which allows for up to 80 test records and up to 10 defibrillator discharge waveforms as wave records. Additional capabilities include the ability to use a barcode scanner or external keyboard for data entry on the device under test identification, or printing of test results directly to an external printer. Add the integrated ECG and Arrhythmia simulation capabilities of the Phase 3 and you have one of the very best values on the market today in a Defibrillator and Transcutaneous Pacer Analyzer.



Ultimate Portability: The Phase 3 detachable paddle plate provides for easy hands-free testing. You can connect the output of your defibrillator directly to Phase 3 input terminals via the defibrillator interconnection cable.

Variable Load Module: The optional VLM allows testing defibrillators at maximum energy with selectable loads from 25 to 175 ohms, in accordance with AAMI DF-80 and IEC 60601-2-4. High resolution wave graphics and test data are obtained with Phase 3VL software - a standard accessory to the VLM. Datrend Systems was "first to market" with this type of option.



Phase 3pc Companion Software: Included as a standard accessory, Phase 3pc allows you to create and edit autosequences, download and store test data and wave graphics to your PC.

For the very best in value, accuracy, and overall performance when it comes to a Defibrillator and Transcutaneous Pacemaker Analyzer... be sure to make your next analyzer a Phase 3!

Phase 3 is backed by the Datrend Systems 5-Year Warranty!

Phase 3

8000-440, 120V, North America
8000-441, 230V, United Kingdom
8000-442, 230V, Europe
8000-443, 230V, Australia



Tests Performed

Defibrillator Energy, Charge Time and Cardioversion
Automated External Defibrillator (AED) Performance
ECG Monitor Performance
Pacer Sensitivity, Refractory Periods and Noise Immunity
Pacer Pulse Characteristics

Energy Measurement, General

Load resistance: 50 ohms $\pm 1\%$, non-inductive
ECG amplitude at defib pads: 1 mV QRS
WAVEFORM (oscilloscope) Output
High Range: 1000:1 amplitude attenuation
Low Range: 200:1 amplitude attenuation
Waveform Playback: 200:1 time base expansion

Defibrillator High Range Energy Test

Energy Measurement: 0.0 to 600.0 Joules ($\pm 1\% \pm 2$ LSD)
Voltage Measurement: 0 to 5000 Volts ($\pm 1\% \pm 2$ LSD)
Current Measurement: 0.0 to 100.0 Amps ($\pm 1\% \pm 2$ LSD)
Pulse Width Measurement: Range: 0.5 to 58.36 msec. ($\pm 1\% \pm 2$ LSD)
Trigger Level: 80 Volts
Playback Amplitude: 1 mV per 1000 volts on Lead II;
1 mV per 2000 volts at defib pads
Test Pulse: 126 Joules $\pm 10\%$

Defibrillator Low Range Energy Test

Energy Measurement: 0.0 to 50.0 Joules ($\pm 1\% \pm 2$ LSD)
Voltage Measurement: 0 to 1000 Volts ($\pm 1\% \pm 2$ LSD)
Current Measurement: 0.0 to 20.0 Amps ($\pm 1\% \pm 2$ LSD)
Pulse Width Measurement: 0.5 to 58.36 msec. ($\pm 1\% \pm 2$ LSD)
Trigger Level: 16 Volts
Playback Amplitude: 1 mV per 200 volts on Lead II;
1 mV per 400 volts at defib paddles
Test Pulse: 46 Joules $\pm 10\%$

Defibrillator Charge Time Test

Charge Time Measurement: 0.0 to 99.9 seconds (± 1 LSD)

Defibrillator Cardioversion Test

Sync Delay Measurement: -200 to +800 msec. (± 1 LSD)
Delay Target: 20 to 65 msec window when enabled
Sync Point: Selectable, peak of ECG Q or R wave

AED Performance Test

Test Method: Verify AED shock advisory for specified arrhythmia

Pacemaker Pulse Test

Pulse Amplitude Measurement: 4 to 250 milliamps, all loads ($\pm 1\% \pm 1$ LSD)
Pulse Rate Measurement: 20 to 220 PPM ($\pm 1\% \pm 1$ LSD)
Pulse Width Measurement: 0.5 to 58.36 msec. ($\pm 1\% \pm 2$ LSD)
Test Load Range: 50 to 1600 ohms, in 50 ohm steps
WAVEFORM output: 50 milliamps per volt, all loads
Measurement Methods: Average, leading edge, trailing edge, peak
Test Pulse: 145 mA $\pm 10\%$

Pacemaker Noise Immunity Test

Test Waveform: 50Hz or 60Hz sine wave
Noise Amplitude Range: 0.00 to 6.00 mV peak-to-peak
Noise Amplitude Precision: 0.023 mV

Pacemaker Sensitivity Test

Test Waveform: Square (SQR), Triangle (TRI) or Haversine (SSQ) pulse
Waveform Width: 10, 25, 40, 100, or 200 msec.
Amplitude Range: 0.00 to 3.00 mV peak

Pacemaker Refractory Period Test

Paced Refractory Period (PRP): 50 to 750 msec. (± 1 LSD)
Sensed Refractory Period (SRP): 50 to 750 msec. (± 1 LSD)

ECG Simulator

Performance Test Waveforms

DC Pulse, 4 seconds, Square Wave, 2 Hz, Triangle Wave, 2 Hz
Sine Wave @ 0.1, 0.5, 10, 20, 40, 50, 60, 70, or 100 Hz

Normal Sinus Rhythm

30, 60, 90, 120, 150, 180, 240 or 300 BPM

Cardioversion, Shock Advisory and AED Test Waveforms

Atrial Fibrillation, Coarse

Atrial Fibrillation, Fine

Asystole 1 (random, low-frequency baseline fluctuation)

Asystole 2 (flat line/zero volts)

Supraventricular Tachycardia (SVT-140)

VTACH @ 140, 160, 190 BPM

Torsades de Pointe @ 200 BPM

Coarse Ventricular Fibrillation (CVF) / Fine Ventricular Fibrillation (FVF)

Arrhythmia Simulations

Second Degree A-V Block, Premature Atrial Contraction (PAC), R-on-T PVC, Right Bundle Branch Block (RBBB), Premature Ventricular Contraction (PVC) Multifocal PVC, Run of 5 PVC, Bigeminy, Trigeminy

Pacemaker Test Waveforms

SQR (square) Pacer Trigger, width = 10, 25, 40, 100 or 200 msec
TRI (triangle) Pacer Trigger, width = 10, 25, 40, 100 or 200 msec
SSQ (haversine) Pacer Trigger, width = 10, 25, 40, 100 or 200 msec

Performance Specifications

Output Level: Selectable, 1 mV, 2 mV or 0.5 mV into ECG Lead II
Impedance: 500 ohms ($\pm 0.2\%$), Amplitude: $\pm 2\%$

Non-Volatile Memory

Memory Type: EEPROM

Data Capacity

80 Test Records, 10 Defibrillator Waveform Records, 32 Autosequences

Test Record Content

Device ID, Time/date of test, Test type (Manual or Auto), Device type (defib. or AED)
Up to 10 defibrillator energy tests (or 32 AED energy tests)
1 defibrillator charge time test
Up to 4 defibrillator cardioversion tests
Up to 12 ECG performance tests
Up to 10 pacer pulse tests
1 pacer noise immunity test
Up to 2 pacer sensitivity tests
Up to 2 pacer refractory period tests

Interface

User Interface

LCD (5.2" x 1.5"; 40 characters x 8 lines text; 240 x 64 pixel graphics)

Defibrillator Input: Molex 42820-3212

Pacemaker Input: 2 x safety-style banana jack (red (+)/black (-))

ECG Simulator Outputs: 10 x safety banana jack (RA; RL; LA; LL; V1-V6)

Defibrillator/Pacer Waveform Output: 1/8" mono phono jack

High-Level ECG Output: 1/8" mono phono jack

USB Port: Type "B", USB 1.1 or USB 2.0 compatible, 64 bytes per msec.

Serial (RS-232) Port: DB9 Male, RS-232C, bi-dir, CTS handshaking, 9600 baud, 8-N-1

Keyboard Port: PS/2 (6-pin miniDIN female)

Power Supply: Internal 12.5V/1.4A-h NiCad, 24 hours of use between charges

Environment

15°C to 40°C, 10% to 90% RH, Altitude: 2000m max., Indoor Use Only, Category II

Dimensions

9.5" W x 8" H x 5.5" D (24cm W x 20cm H x 14cm D)

Weight 3 lbs. (1.4 kg)

Standard Accessories

Adult Paddle Adapter (P/N 7400-442)

Adult Paddle Adapter Cable (P/N 7200-444)

USB Cable (A-B Male) (P/N 3140-440)

Phase3pc Software on CDROM (P/N 6950-004)

Operator's Manual on CDROM

AC Adapter (region-specific)

Optional Accessories

ECG-to-Banana Adapter Set (P/N 7500-425 - Set of 10)

Internal Paddle Adapter Set (P/N 7400-443)

Variable Load Module (P/N 7900-460)

Variable Load Module Software on CDROM (P/N 6950-005)

Unterminated Defibrillator Adapter Cable (P/N 7200-445)

Unterminated Pacemaker Adapter Cable (P/N 7200-446)

Computer Interface Cable (RS-232), DB9F - DB9F (P/N 3140-400)

Computer Interface Adapter (RS-232), DB9M - DB25F (P/N 3140-401)

Printer Interface Adapter, DB9M - DB25M (P/N 3140-402)

Barcode Pen Reader, RS-232 (P/N 7050-050)

Barcode CCD Scanner, RS-232 (P/N 7600-051)

Barcode CCD Scanner, PS/2 (P/N 7600-052)

External printer (please call for additional information)



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