Delta 1600

User Manual

▶Compact ▶Lightweight ▶Easy to Use

AED Tester

(Automated External Defibrillator Tester)

NETECH

Innovative Instruments Since 1987

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Notices

Unpacking and Inspection of the Unit

Before unpacking the Delta 1600, inspect the shipping box for any visual damage. If damage is found, do not unpack the unit and immediately notify the shipping carrier. If no damage is found to the shipping box, open the box and perform a visual inspection of the Delta 1600. If any damage to the unit is observed please contact Netech Customer Service.

The Service Return Form may be obtained at our website https://www.NetechBiomedical.com/RMA-Request or contact our Customer Service Department at CustomerService@NetechBiomedical.com

Contact Information

Netech Corporation, 110 Toledo St. Farmingdale, NY 11735
Phone: 631-531-0100, 1-800-547-6557

Warnings

SYMBOL	DESCRIPTION
	Caution: Important Safety Information
	Hazardous Voltage
CE	Conforms to European Union Directive

Calibration

The Delta 1600 is factory calibrated, thoroughly tested, and meets Netech's ISO 9001-2015 quality standards.

Any attempt to remove or tamper with the calibration seal will void the warranty.

Intended User

The Delta 1600 is intended to be used by a trained technician.

The Delta 1600 is intended for testing and verifying the performance of AEDs.

The Delta 1600 should never be used in a patient care location where it might come in contact with a patient.

The Delta 1600 is intended to be used within the published specifications. Any unauthorized alteration or modifications will result in a hazardous condition or improper operation.

Environment

The Delta 1600 should never be used in harsh environmental conditions outside the specifications as this will affect the performance of the unit.

The Delta 1600 should never be used in wet condition or in a flammable environment.

Introduction

The Delta 1600 is a precision, compact, and battery operated instrument for testing automated external defibrillators (AEDs). The Delta 1600 simulates various cardiac waveforms to ensure that the AED can detect, analyze and audibly advise shock. In addition to the shock advisory test, Delta 1600 measures discharged energy of the AED, thereby ensuring that the AED complies with specified requirements. The dedicated function keys and menu driven display on the unit makes it simple for operation.

The Delta 1600 has a built-in load resistance of 50 ohms to simulate the human body impedance. To establish electrical connection between the AED and the Delta 1600, manufacturer specific interface cables (contact Netech Sales for custom cables) are required. The interface cable must be connected between the AED and input jacks of Delta 1600. Once the AED is discharged, Delta 1600 samples the pulse, calculates and displays the delivered energy

Delta 1600 Features

- Unique, one-of-a kind instrument for testing all AEDs including Pulsed (Schiller AEDs)
- Compact, lightweight, and easy-to-use
- Auto Function – Eliminates multiple discharges
- Large back lit Graphics Display
- Multiple Arrhythmia simulations
- 7.4 Volt Li-Ion Rechargeable battery

Specifications

Energy Measurement

Energy Output:

Maximum Energy : 500 J

Display Resolution : Based on Auto Range

Resolution : 1 J

Accuracy : ±1 % of reading ± 1

Load Resistance:

50 ohms ±1 %; non-inductive (< 1 µH)

Sampling Time : 20 uS

Measurement Time Window : 60 ms

Pulse Width : 60 ms

Patient Simulator

Waveform Simulation: ECG (NSR),

ECG Rate: 60, 70, 80, 90, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 220, 240. BPM

Accuracy: ± 1%

Waveform Amplitude: ECG (AMP)

ECG Amplitude:1.0, 2.0, 3.0, 4.0 mV

Accuracy: ± 5% peak to peak

Arrhythmia Selections: (Shock advisory waveforms)

Ventricular Fibrillation Coarse (VFBC)

Ventricular Fibrillation Fine (VFBF)

Ventricular Tachycardia (VTAC)

Atrial Fibrillation (AFIB)

General Specifications

Temperature Range:

Operating : +15°C to +35°C

Storage : 0°C to +50°C.

Display:

Type: LCD with LED back lit Graphics display

Power :

7.4 Volt Li-Ion Rechargeable Battery

100-230 VAC input 8.5V Battery Charger

Housing: High impact ABS plastic enclosure

Dimensions:

D x W x H :10.25 x 6.25 x 2.5 Inch

26 X 16 x 6.4 Cm

Part Numbers and Ordering Information

Part Number: 630

Delta 1600 AED Tester

(All Standard Accessories are included).

Standard Accessories: (Included with the unit)

250-LI-BATTERY: Li-ion rechargeable battery

660-HHS-002: Li-ion Battery Charger

630-HARD-CASE: Hard carrying case

630-6383: Open-ended interface cable

Optional Accessories:

PART NO.	INTERFACE CABLE
630-651-HP	HP/Philips
630-651-ZOLL	ZOLL
630-651-SURVIVAL	Cardiac Science/Survivalink/Burdick Cardiovive
630-651-PHYSIO	Physio-Control/Life-Pak/Medtronic
630-612	Philips HeartStart FRx
630-615	Philips (and Laerdal) HeartStart FR3
630-617	Philips (and Laerdal) HeartStart FR/FR2/ FR2+
630-618	Philips HeartStart OnSite and HeartStart Home
630-619	Defibtech Lifeline or Lifeline AUTO AED
630-620	Defibtech Lifeline VIEW/ECG/PRO
630-621	CU Medical Systems
630-622	ZOLL CPR-D-padz
630-623	W AED Plus or ZOLL AED Pro
630-Cardiac-G5	Cardiac Science Powerheart G5

Note:Various Manufacturers' model specific interface cables are available. Please call for the part numbers or visit www.NetechBiomedical.com

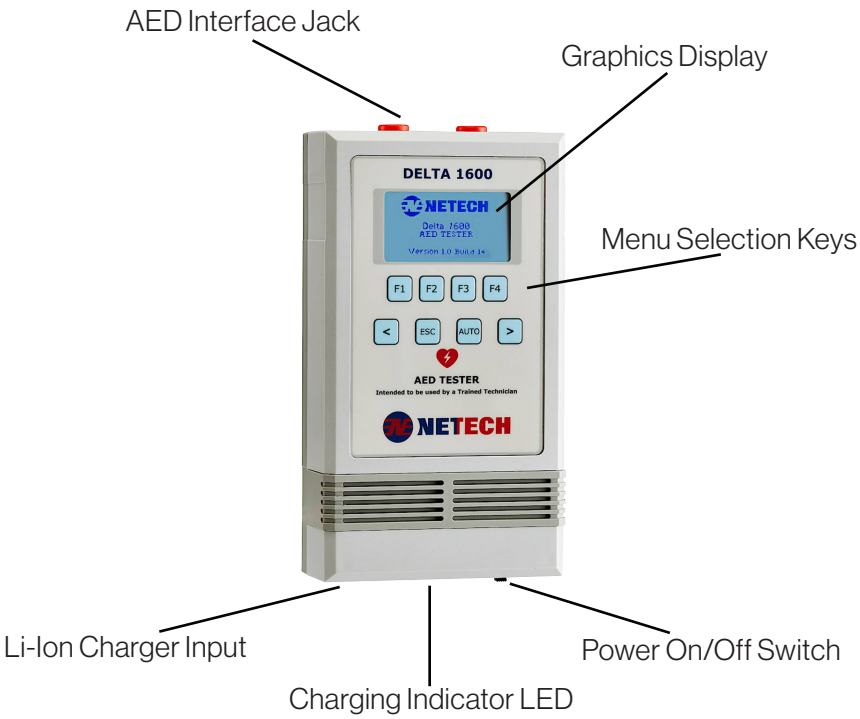
Preparation for Use

The Delta 1600 is shipped with the following items included in the customized hard case:

- Delta 1600 AED Tester.
- Li-Ion Rechargeable Battery Charger (110/220 V input)
- User manual / USB Jump Drive

Before getting started, it is important to get familiar with the control and operation of the Delta 1600.

Instrument Familiarization



Display

The Delta 1600 incorporates a high contrast LCD graphics display with an LED back light for easy viewing.

Key Pad

The keypad utilizes soft touch tactile keys, providing a fluid resistant barrier to the internal circuitry. The dedicated key functions and interactive menu make it easier to use.

The following are the description of the Key Functions:

F1, F2, F3, F4, <, and >: These are interactive keys associated with respective function selections.

"ESC": Reverts to the previous menu

"AUTO": Pressing "AUTO" key changes the Arrhythmia (previously selected) to VFBC. Once the discharged energy is displayed, arrhythmia changes automatically to NSR (Normal ECG @ 90 BPM)

This will eliminate multiple discharges by the AED, thus saving the AED batteries.

Follow AED's shock advisory audio response.

AED Interface Jack

2 Red Shrouded banana jacks.

Power On/Off Switch

This switch powers the unit on/off. The power ON/OFF switch is located on the lower side panel.

Battery Charger Input connector:

DC jack (2.1mm)- Li Ion battery charger Input connection.

Battery Charger Input connector:

Yellow LED indicates that the battery charging is active.

Note: The Battery Charge function is active only in the Power OFF mode.

Battery Charger:

Li-Ion Battery Charger provided with the unit is specifically designed for the Delta 1600. When the battery is fully charged, the red LED on the CHARGER changes to green.

Battery:

Delta 1600 incorporates a specially designed 7.4V Li-Ion polymer battery with short circuit protection. The battery is enclosed in a fireproof battery compartment with tamper proof seal.

Do not attempt to break the seal and tamper with the battery.

Doing so will damage the unit and void the Warranty.

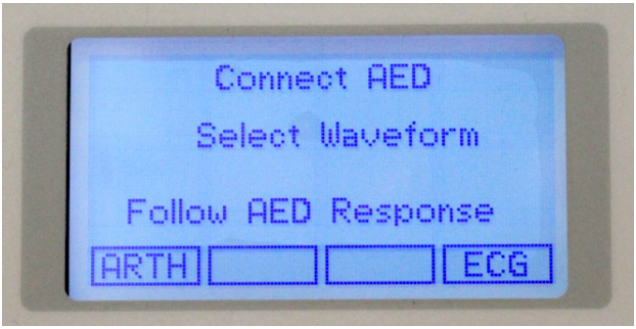
Initial Setup

Introduction

The Delta 1600 is simple to operate and requires minimum setup However, the user must read the manual thoroughly for safe and proper operation.

When the unit is first powered, the screen momentarily shows the software version and the build number. Thereafter, the Main Menu will be displayed as illustrated below.

AED Main Menu



The functions associated with the menu prompt can be selected by the F1 –F4 Keys. In this Menu there are two selections.

1. Press F1 (“ARTH”) for the Arrhythmia Menu.

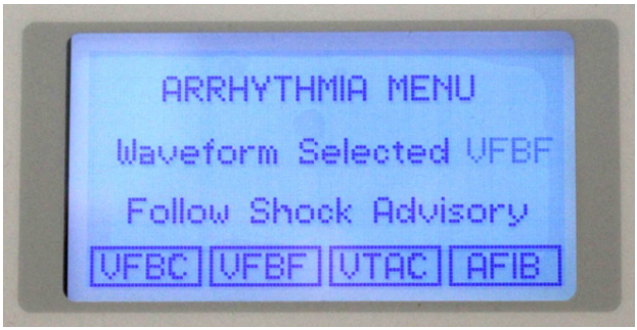
2. Press F2 (“ECG”) for the ECG–Rate and Amplitude Menu.

Shock Advisory Test

WARNING: Before getting started, follow the manufacturers safety instructions and test procedures.

Defibrillator discharge voltages are potentially dangerous. To avoid potential shock hazards, observe all safety procedures for the safe handling of the instrument before attempting to test the defibrillator.

- Connect the manufacturer specific interface cable between the Delta 1600 (red shrouded banana jacks) and the AED under test.
- From the AED Main Menu, press 'F1'(Arrhythmia Menu) and select the Arrhythmia waveform. (The default waveform is "VFBC")
- Select the desired Arrhythmia waveform by pushing F1, F2, F3 or F4.
- The selected Arrhythmia waveform will be displayed (flashing) as illustrated below.

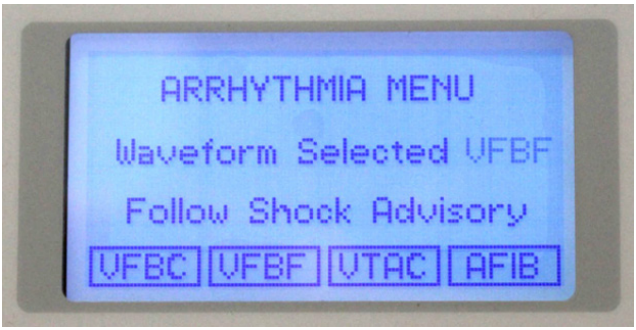


- Turn the AED power ON and follow the manufacturer's operating instructions and the audio response.

• The AED will analyze the selected waveform and audibly alert either "shock advised" or "no shock advised"; depending on the selected arrhythmia.

Stay clear. The discharge energy is lethal. Do not touch the Cable or the unit.

• If the response is "no shock advised", select a different arrhythmia waveform from the arrhythmia menu and repeat the process.



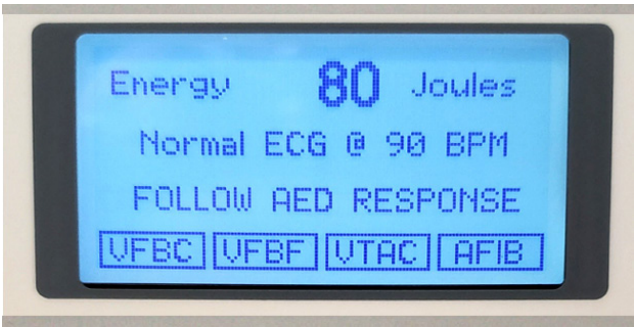
• If the response is "shock advised", press "SHOCK" on the AED and wait until the energy is discharged. Once discharged, the energy will be displayed as illustrated below.

To stop the 'SHOCK' advisory, select "ESC" and press F4 from the AED menu to run an ECG (NSR –Normal Sinus Rhythm) waveform.

AUTO Function Test

The Delta 1600 Auto function is a very useful method for testing energy discharge of AEDs. “AUTO” function will prevent the need for multiple discharges and helps preserve the battery life of the AED.

- Select “AUTO” key and wait for the AED’s response. (The default arrhythmia waveform is set to “VFBC”)
- If shock advised, discharge the AED
- The discharge energy is displayed and the arrhythmia waveform is switched to normal ECG @ 90 BPM as illustrated below.

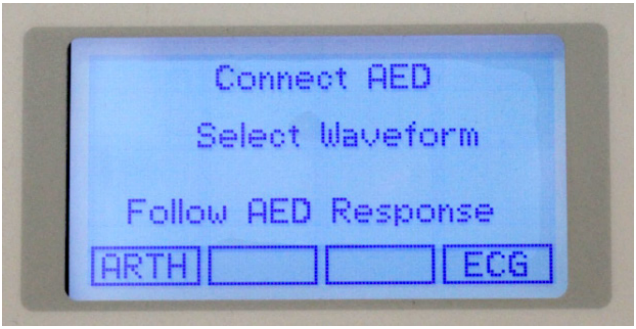


- Once the AED detects normal ECG @ 90 BPM, further shocks will not be advised.

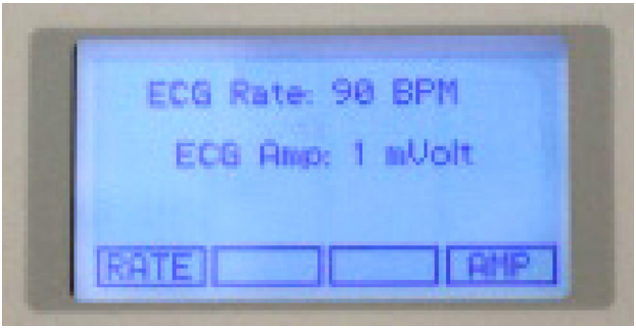
ECG Simulation

The Delta 1600 simulates ECG (Normal Sinus) waveforms with user selectable rates and amplitudes.

From the Main Menu select F4 “ECG”



The Rate and amplitude function can be selected from the following ECG selection menu.



Rate Selection

The default ECG rate is set @90 BPM. ECG rate can be changed in 10 BPM increments from 60 BPM up to 200 BPM and 20 BPM increments from 200 BPM up to 240 BPM by pushing the F1 key.

Amplitude Selection

The default ECG Amplitude is set @ 1 mVolt. The ECG Amplitude can be changed in increments of 1 mV up to 4 mV by pushing F4 key.

Warranty

Netech warrants this instrument to the original purchaser, as purchased from a Netech distributor or dealer, will conform to the written specification as of the date of its manufacture, for a period of two years from the date of purchase. The second year warranty, and is contingent upon returning the unit to the factory for the annual recalibration. Netech warrants this instrument against defects in materials and workmanship. If it fails to conform to these warranties, Netech will repair or replace the unit and/or its components within two weeks of arrival at our facility. These warranties are made upon the expressed condition that::

1. *The purchaser promptly notifies Netech in writing of any non-conformity with the above warranty including a detailed explanation of the alleged deficiencies.*

2. *The Delta 1600 is returned to Netech at the buyer's expense only after obtaining the proper RMA authorization from Netech Service Department.*

3. *Netech will not be liable for any incidental or consequential damages.*

4. *In the opinion of Netech upon inspection, the Delta 1600 has not been misused, altered (broken tamper seals), or damaged due to the abnormal handling and/or operation.*

5. *Repairs to the Delta 1600 and/or its components have not been made by anyone other than Netech or one of its authorized service agents.*

6. *The Delta 1600 has not been modified, altered, or changed*

in any manner by anyone other than Netech or one of its authorized service agents.

7. All shipping and handling charges will be billed to the purchaser.

THIS WARRANTY EXCLUDES ALL OTHER WARRANTIES, WHETHER EXPRESSED OR IMPLIED, ORAL OR WRITTEN, INCLUDING WITHOUT LIMITATION WARRANTIES OF MERCHANTABILITY AND / OR FITNESS FOR A PARTICULAR PURPOSE. NETECH IS NOT LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES OR LOSSES FROM ANY MISUSE OF THE INSTRUMENT

Appendix: A

Netech warrants this instrument to the original purchaser, as

Current Revision: R1 06/12/17

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