

# Multi-Battery Tester™

with *Pu*Lse Load Technology

- Easy to Use - no switches or settings
- Determines remaining battery power
- Patented, high accuracy Pulse Load test
- Test alkaline, lithium, coin, rechargeables

## **ZTS Multi-Battery Tester (MBT-1)**

This microprocessor-controlled instrument is designed to test more than 30 battery types including rechargeable. After a fully automatic test cycle, percentage of remaining battery capacity is indicated on the LED bar display. Battery types are clearly labeled next to the appropriate contacts, and test results are easy to understand.

- **Auto low power stand-by mode**
- **Get test results in seconds**
- **Impact resistant rubberized enclosure**
- **One-year warranty**



# **Pulse Load Multi-Battery Tester™**

## **Pulse Load Technology**

This tester provides a fully automatic pulse load test to determine state of charge (SOC) or state of power. The pulse load test simulates real power demand and measures battery performance, not just voltage.

- **Easy to use - no switches or settings**
- **Quickly and easily identifies weak or failing batteries**
- **Fully automatic - high accuracy Pulse Load test**
- **Ideal for battery management and cell matching**

## **Applications**

- Office
- Residential
- Remotes
- Service
- Manufacturing
- Medical
- Photographic
- Professional
- Electronics
- Military
- Battery management
- Scientific
- Government
- Institutions
- Music
- Utilities
- Security
- Safety
- Quality Assurance
- Rechargeables

**Part No. MBT-1**

**U.S. Patents 6,823,274 and D569,285**



**ZTS, Inc.**  
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Made in the U.S.A.

*Uses 4AA batteries (not included)*



# READ ME FIRST

ZTS Multi-Battery Testers create real power demand on the battery under test. Follow these simple steps for consistent, accurate test results.

**NOTE:** Install 4 new alkaline batteries in unit.

*Testing is two simple steps*



**1. Place battery (+) on appropriate contact terminal**



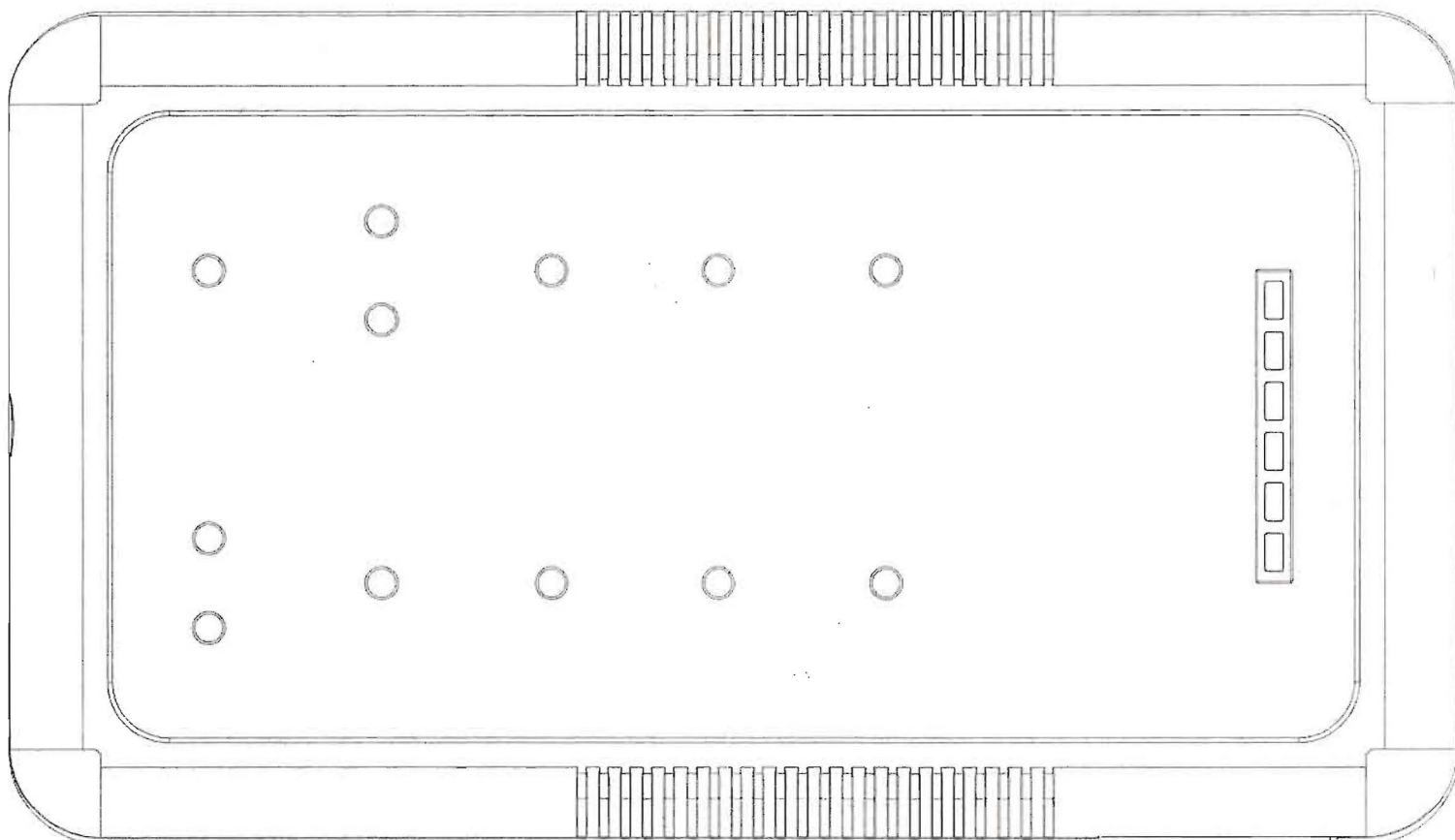
**2. Hold probe vertically. Press firmly straight down onto the battery (-)**

**Remember, press the probe tip firmly down onto the battery during the entire Pulse Load test (while LEDs are 'running').**

## Tips for Better Testing

1. Clean connections are important. Verify that the battery's terminals and the tester's contact terminals are clean before making a test. We recommend periodic cleaning with 91% isopropyl alcohol and soft cloth.
2. If a battery slips off the terminal during the test cycle ('running' LEDs), wait several seconds, then start a new test.
3. When testing **9-volt** batteries, an easy technique is to place the battery on the test terminals, then gently twist the battery against the tester's terminals to maintain a good connection.
4. Used batteries may 'recover' when rested. For best accuracy, always make two or more consecutive tests to verify that the battery has stabilized and is capable of consistent power output. Wait several seconds between each test.
5. Certain new batteries may test less than full capacity new out-of-the package. This may be due to the battery's chemistry not fully activating. Try several tests or warm the battery in your hands for a few seconds. Please note that not all new batteries are at full capacity.





- Easy to Use - no switches or settings
- Quickly and easily identifies weak or failing batteries
- Fully automatic - Patented, high accuracy Pulse Load test
- Ideal for battery management and cell matching

**Applications:**

- |                     |                      |
|---------------------|----------------------|
| • Service           | • Battery management |
| • Remotes           | • Utilities          |
| • Security          | • Safety             |
| • Industrial        | • Scientific         |
| • Medical           | • Government         |
| • Electronics       | • Office             |
| • Manufacturing     | • Military           |
| • Quality Assurance | • Institutions       |
| • Music             | • Theater            |

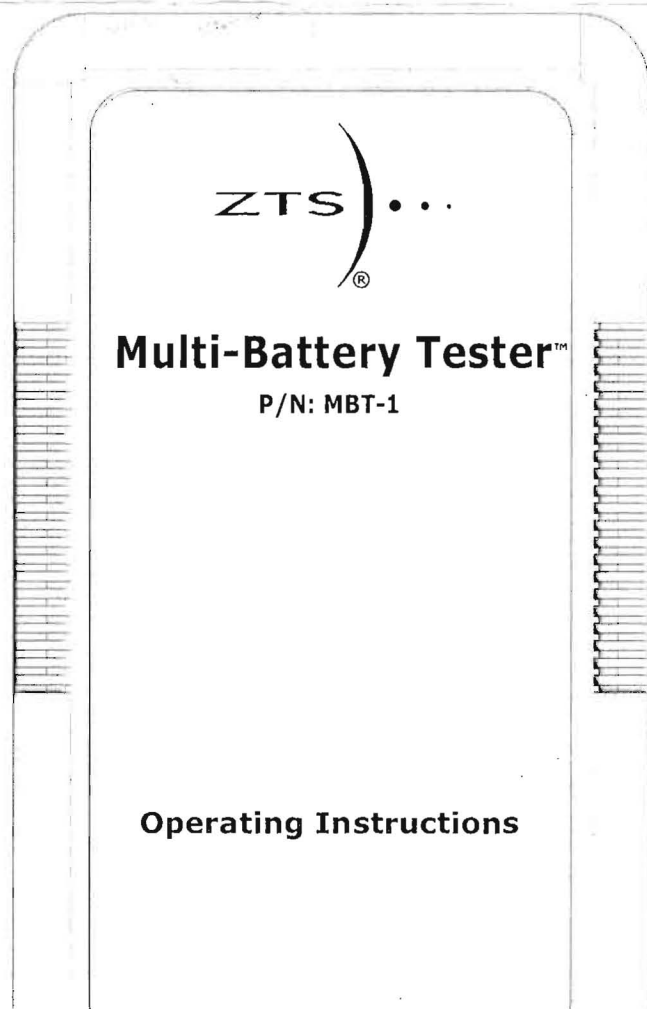


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**Made in U.S.A.**

*Uses 4 AA batteries (not included)*



## Product Description

The ZTS Multi-Battery Tester™ (MBT-1) is a microprocessor-controlled instrument designed to test many popular battery types including alkaline, lithium, silver oxide, as well as rechargeable types such as NiMH and Li-Ion. This tester computes the battery's remaining power capacity using a fully automatic, high accuracy Pulse Load test. U.S. Patents 6,823,274 and D569285.

A pulse load test begins when a battery is placed in contact with the tester's terminals. After the automatic test cycle, indicated by 'running' LEDs, percentage of remaining battery power capacity is indicated on the LED bar display. Batteries will not be harmed by repeated testing or by holding contact after a test cycle.

## Getting Ready to Test Batteries

Install 4 x AA new alkaline batteries into your tester's battery compartment, carefully noting correct orientation. The 100% green LED will blink for approximately 5 seconds during initial start-up, indicating that the tester's internal 4 AA batteries are good. Replace the battery cover and your Multi-Battery Tester™ is ready to use.

**NOTE:** This tester has a self-test low battery power indicator. Replace the tester's 4 AA batteries (internal) if only the two red LEDs (10% & 20%) blink alternately during initial start-up or during a test cycle.

## Testing Batteries

There are no settings to make prior to testing. Select the proper terminal for the battery you plan to test, then follow these simple steps:

1. Place the battery's positive (+) terminal on the appropriate tester terminal. Battery types are clearly labeled next to each contact terminal.
2. Hold the built-in probe tip firmly against the battery's negative (-) terminal. If you are using a twin terminal set, for example 9-volt, the built-in probe is not used.
3. Hold contact firmly throughout the entire test cycle (during 'running' LEDs), then continue to hold contact to display the test result.
4. Lift the probe or battery to end a test. Repeat test for best accuracy.
5. When testing rechargeable type batteries (NiMH & Li-Ion), it is recommended that the battery be off the charger for at least 20 minutes prior to testing.

To test CRV3 and 9-volt batteries, note the polarity then hold the battery against the appropriate twin terminal set.

The display will remain lit until the battery is removed from the tester's terminals. This does not harm or drain the battery being tested.

## Tips for Better Testing

1. Clean connections are important. Verify that the battery's terminals and the tester's contact terminals are clean before making a test. We recommend periodic cleaning with 91% isopropyl alcohol and soft cloth. This is especially important when testing rechargeable batteries (NiMH & Li-Ion) since they are generally handled more frequently which can result in contamination on the terminal surfaces. It is also important to periodically clean the battery charger's contacts.
2. If a battery slips off the terminal during the test cycle ('running' LEDs), wait several seconds, then start a new test.
3. When testing 9-volt batteries, an easy technique is to place the battery on the test terminals, then gently twist the battery against the tester's terminals to maintain a good connection.
4. Used batteries may 'recover' when rested. For best accuracy, always make two or more consecutive tests to verify that the battery has stabilized and is capable of consistent power output. Wait several seconds between each test.
5. Certain new batteries may test less than full capacity new out-of-the package. This may be due to the battery's chemistry not fully activating. Try several tests or warm the battery in your hands for a few seconds. Not all new batteries are at full capacity.

## In Case of Problems

If there is no operation, that is, no LED activity or indication of a test cycle, try the following:

1. Remove then reinsert one of the tester's internal (AA) batteries. Verify that all batteries are installed in the correct orientation.
2. Verify that the battery you are testing is positioned correctly and its terminals are clean.
3. Check a known good battery. If the battery you are testing is completely discharged (less than 1% of capacity), the tester will not start a test cycle.

## About Rechargeable Batteries

### Capacity

This is the total amount of stored energy that is available from a fully charged cell or cells. A battery's usable capacity is dependent upon the rate of discharge, temperature, and the specified cut-off voltage. Most batteries have a rated capacity, expressed in amp-hours, that is based on a specified constant discharge rate to a specified cut-off voltage. Capacity will decrease at higher rates of discharge and increase with lower rates of discharge. New rechargeable batteries require several (3-4) charge-discharge cycles followed by float charging to achieve optimum/maximum capacity.

### Self-Discharge

All rechargeable batteries will lose capacity over time through self-discharge. The self-discharge rate is a function of cell chemistry and storage temperature. Thus a new, fully charged battery which has been stored for a period of time may test less than 100% until it is recharged.

### Battery Life

Rechargeable batteries will lose capacity through aging, and the number of charge-discharge cycles experienced by the battery. A battery's ability to take/accept a full charge deteriorates throughout the life of the battery. Therefore, an aging battery that has been recently charged may only test at 60% or less of full capacity. Other factors that affect capacity are the depth and rate of discharge, operating temperature, and charging method.

## Specifications

### Testing capability

3.6v Li-Ion rechargeable [RCR123A, 18500, 17650, 18650]  
1.5v button cell [S76, A76, A625, A640, LR44, 357, 303]  
1.2v NiMH/NiCd rechargeable [AA, AAA, C, D]  
1.5v lithium [AA (L91), AAA (L92)]  
3v lithium coin [2016, 2025, 2032, 2320, 2450, 1/3N]  
6v '28' series [28A, S28, 28L]  
3v photo lithium [CR123, CR2, CRV3]  
1.5v alkaline [AA, AAA, C, D, N]  
12v alkaline [A23]  
9v alkaline, carbon zinc

Power (internal): 4 x AA. Auto self-test

Testing load: Varies according to battery type

Testing cycle: Microprocessor-controlled pulse load

Display: Six LEDs - Green, yellow, and red

Terminals: Nickel-plated brass for high conductivity

Built-in negative test lead/probe

Dimensions: 8" x 4.5" x 1.25"

20.3cm x 11.4cm x 3.2cm

Weight: 14.5 oz. / 400g (without batteries)

Part No.: MBT-1

UPC: 856777000169

## Contact Information

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