

**FLUKE**®

**Biomedical**

# ULT800

## TEE Transducer Leakage Current Tester

**Users Guide**

PN 2461434

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# ***Warranty and Product Support***

Fluke Biomedical warrants this instrument against defects in materials and workmanship for one full year from the date of original purchase. During the warranty period, we will repair or, at our option, replace at no charge a product that proves to be defective, provided you return the product, shipping prepaid, to Fluke Biomedical. This warranty does not apply if the product has been damaged by accident or misuse or as the result of service or modification by other than Fluke Biomedical. **IN NO EVENT SHALL FLUKE BIOMEDICAL BE LIABLE FOR CONSEQUENTIAL DAMAGES.**

Only serialized products and their accessory items (those products and items bearing a distinct serial number tag) are covered under this one-year warranty. **PHYSICAL DAMAGE CAUSED BY MISUSE OR PHYSICAL ABUSE IS NOT COVERED UNDER THE WARRANTY.** Items such as cables and non-serialized modules are not covered under this warranty.

Recalibration of instruments is not covered under the warranty.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state, province to province, or country to country. This warranty is limited to repairing the instrument to Fluke Biomedical's specifications.

## ***Warranty Disclaimer***

Should you elect to have your instrument serviced and/or calibrated by someone other than Fluke Biomedical, please be advised that the original warranty covering your product becomes void when the tamper-resistant Quality Seal is removed or broken without proper factory authorization. We strongly recommend, therefore, that you send your instrument to Fluke Biomedical for factory service and calibration, especially during the original warranty period.

## ***Notices***

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you would like other reproductions or distributions, submit a written request to Fluke Biomedical.

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## Unpacking and Inspection

Follow standard receiving practices upon receipt of the instrument. Check the shipping carton for damage. If damage is found, stop unpacking the instrument. Notify the carrier and ask for an agent to be present while the instrument is unpacked. There are no special unpacking instructions, but be careful not to damage the instrument when unpacking it. Inspect the instrument for physical damage such as bent or broken parts, dents, or scratches.

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## Technical Support

For application support or answers to technical questions, either email [techservices@flukebiomedical.com](mailto:techservices@flukebiomedical.com) or call 1-800- 648-7952 or 1-425-446-6945.

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## Claims

Our routine method of shipment is via common carrier, FOB origin. Upon delivery, if physical damage is found, retain all packing materials in their original condition and contact the carrier immediately to file a claim. If the instrument is delivered in good physical condition but does not operate within specifications, or if there are any other problems not caused by shipping damage, please contact Fluke Biomedical or your local sales representative.

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## Standard Terms and Conditions

### Refunds and Credits

Please note that only serialized products and their accessory items (i.e., products and items bearing a distinct serial number tag) are eligible for partial refund and/or credit. Nonserialized parts and accessory items (e.g., cables, carrying cases, auxiliary modules, etc.) are not eligible for return or refund. Only products returned within 90 days from the date of original purchase are eligible for refund/credit. In order to receive a partial refund/credit of a product purchase price on a serialized product, the product must not have been damaged by the customer or by the carrier chosen by the customer to return the goods, and the product must be returned complete (meaning with all manuals, cables, accessories, etc.) and in “as new” and resalable condition. Products not returned within 90 days of purchase, or products which are not in “as new” and resalable condition, are not eligible for credit return and will be returned to the customer. The Return Procedure (see below) must be followed to assure prompt refund/credit.

### Restocking Charges

Products returned within 30 days of original purchase are subject to a minimum restocking fee of 15 %. Products returned in excess of 30 days after purchase, but prior to 90 days, are subject to a minimum restocking fee of 20 %. Additional charges for damage and/or missing parts and accessories will be applied to all returns.

### Return Procedure

All items being returned (including all warranty-claim shipments) must be sent freight-prepaid to our factory location. When you return an instrument to Fluke Biomedical, we recommend using United Parcel Service, Federal Express, or Air Parcel Post. We also recommend that you insure your shipment for its actual replacement cost. Fluke Biomedical will not be responsible for lost shipments or instruments that are received in damaged condition due to improper packaging or handling.

Use the original carton and packaging material for shipment. If they are not available, we recommend the following guide for repackaging:

- Use a double-walled carton of sufficient strength for the weight being shipped.
- Use heavy paper or cardboard to protect all instrument surfaces. Use nonabrasive material around all projecting parts.
- Use at least four inches of tightly packed, industry-approved, shock-absorbent material around the instrument.

**Returns for partial refund/credit:**

Every product returned for refund/credit must be accompanied by a Return Material Authorization (RMA) number, obtained from our Order Entry Group at 1-800-648-7952 or 1-425-446-6945.

**Repair and calibration:**

To find the nearest service center, goto [www.flukebiomedical.com/service](http://www.flukebiomedical.com/service) or

In the U.S.A.:

Cleveland Calibration Lab

Tel: 1-800-850-4606

Email: [globalcal@flukebiomedical.com](mailto:globalcal@flukebiomedical.com)

Everett Calibration Lab

Tel: 1-888-99 FLUKE (1-888-993-5853)

Email: [service.status@fluke.com](mailto:service.status@fluke.com)

In Europe, Middle East, and Africa:

Eindhoven Calibration Lab

Tel: +31-402-675300

Email: [ServiceDesk@fluke.com](mailto:ServiceDesk@fluke.com)

In Asia:

Everett Calibration Lab

Tel: +425-446-6945

Email: [service.international@fluke.com](mailto:service.international@fluke.com)

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## Certification

This instrument was thoroughly tested and inspected. It was found to meet Fluke Biomedical's manufacturing specifications when it was shipped from the factory. Calibration measurements are traceable to the National Institute of Standards and Technology (NIST). Devices for which there are no NIST calibration standards are measured against in-house performance standards using accepted test procedures.

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## **WARNING**

Unauthorized user modifications or application beyond the published specifications may result in electrical shock hazards or improper operation. Fluke Biomedical will not be responsible for any injuries sustained due to unauthorized equipment modifications.

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## **Restrictions and Liabilities**

Information in this document is subject to change and does not represent a commitment by Fluke Biomedical. Changes made to the information in this document will be incorporated in new editions of the publication. No responsibility is assumed by Fluke Biomedical for the use or reliability of software or equipment that is not supplied by Fluke Biomedical, or by its affiliated dealers.

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## **Manufacturing Location**

The ULT800 Ultrasound Transducer Leakage Current Tester is manufactured in Everett, WA, U.S.A.



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**ULT800**

*User's Guide*

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**ULT800**

*User's Guide*

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## ***Introduction***

The ULT800 TEE Transducer Leakage Current Tester measures the leakage current of ultrasound transducers independent of their ultrasound systems. Use the hand-held, battery-operated instrument during the routine transducer cleaning procedure conducted between patients.

Connect the transducer to be tested to the ULT800 via a unique adapter. The ULT800 performs the measurement with the transducer immersed in either the cleaning solution or saline. To insure that the leakage current test is accurate, first test the conductivity of the fluid. A special dual element probe also connected to the ULT800 tests the conductivity of the fluid. A green **PASS** light or a red **FAIL** light indicates the results of the conductivity and leakage current tests.

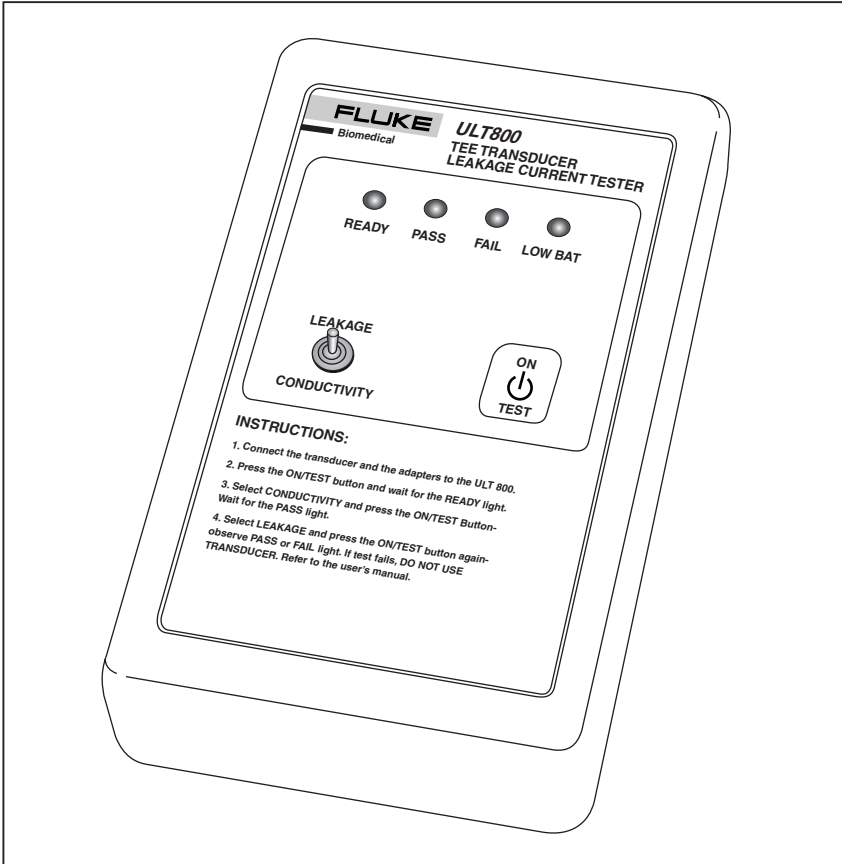
In addition to verifying that the ultrasound transducers are safe for patient use, the ULT800 makes it possible to reduce expensive repairs. Identifying transducers that exceed safe leakage currents early may allow for repairs to be made before a transducer becomes non-repairable.

## ***Key Features***

- Hand-held instrument
- Stand-alone operation
- Direct measurement of leakage current
- Pass/Fail display of test results
- Battery operation for safety
- Independent of 120 or 240V ac systems
- Built-in self-test circuit
- Auto shut off to conserve battery

## **Controls and Indicators**

Input connectors are interchangeable and provide for inputting an ultrasound transducer adapter and the dual conductivity electrode. Refer to Figure 1 and Table 1 for complete control and indicator descriptions.



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**Figure 1. Controls and Indicators**

**Ultrasound Transducer Leakage Current Tester**  
*Controls and Indicators*

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**Table 1. Controls and Indicators**

<b>Item</b>	<b>Description</b>
READY	Glows amber when the self-test procedure completes (approx. 8 sec.). The ULT800 is then ready for testing.
PASS	Glows green when either the Conductivity Test or Leakage Test passes.
FAIL	Glows red when either the Conductivity Test or the Leakage Test fails. Pulses red when the Leakage Test results in less than 20 $\mu$ A, indicating a possible open circuit condition with invalid test results.
LOW BAT	Flashes red to indicate that the battery requires replacement.
LEAKAGE/CONDUCTIVITY SWITCH	Selects the test to perform.
ON/TEST BUTTON	Turns the ULT800 on and initiates the selected test.
BATTERY COMPARTMENT	(not shown): Holds a 9-volt alkaline battery. The instrument automatically powers off if you do not perform a test within 12 seconds.

## **Specifications**

Power: 9 V Alkaline Battery

No. of Measurements: Approximately 1000 measurements on a single battery

Conductivity: Limit to pass: greater than 250  $\mu\text{A}$   $\pm 5\%$

Leakage: Limits to pass: less than 185  $\mu\text{A}$   $\pm 5\%$  and greater than 20  $\mu\text{A}$   $\pm 5\%$

Dimensions: 6.5 x 3.7 x 1.5 in. (17 x 19 x 4 cm)

Weight: 12 oz (340 g)

### Environmental

Operation Temperature: 15 ° to 40 ° C

Storage Temperature: 15 ° to 65 ° C

Relative Humidity: 90 % Max

## **Using the ULT800**

### **⚠ ⚠ Warning**

**To avoid personal injury, do not touch the dual conductivity electrode rods. Voltage is present on the rods during a test.**

**Inspect the conductivity probe for damaged insulation or exposed metal. To avoid personal injury, replace a damaged conductivity probe before using.**

### **⚠ Caution**

**To avoid damage to the transducer, observe the immersion levels. Do not immerse or allow the cable or connector of a transducer to become wet.**

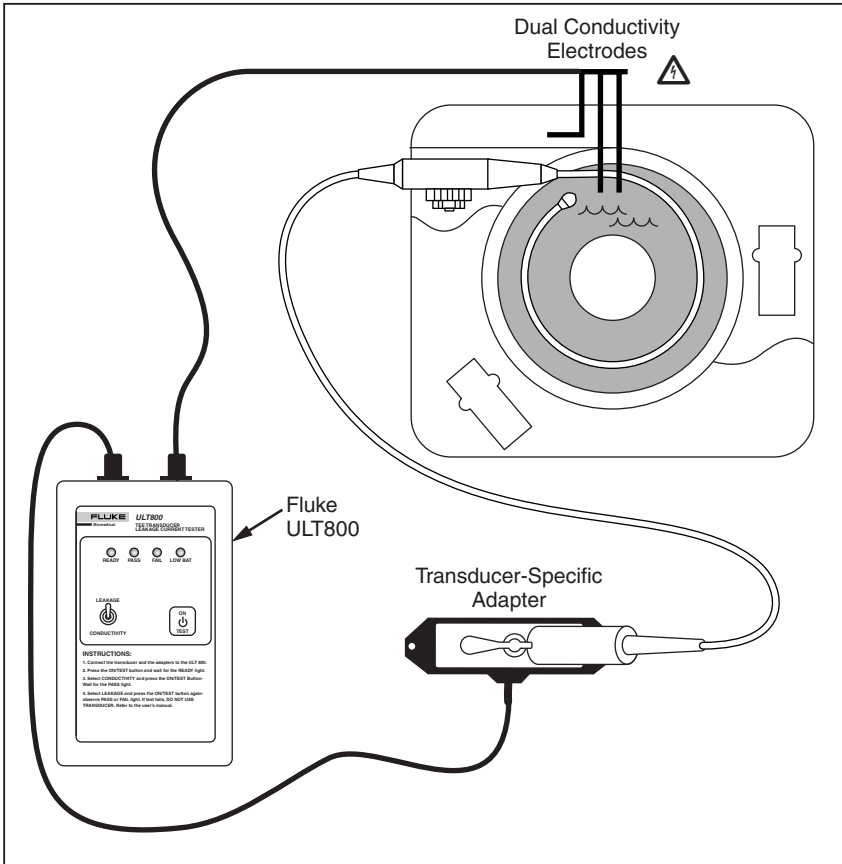
The ULT800 TEE Transducer Leakage Current Tester is a portable, self-contained, battery-operated device. It measures the leakage current of the devices attached to its connectors. The ULT800 applies 120 VAC, 60 Hz to devices placed in a conductive bath (basin or storage tube). The ULT800 measures the current and compares the results to an internal threshold. The instrument displays the results as a **PASS** or **FAIL** indication. It also performs an internal self-calibration on each measurement cycle.

The ULT800 makes two types of measurements. The Leakage Test measures the current between the probe and the electrode. The Conductivity Test measures the conductivity of the bath solution between the two electrodes.

Figures 2 and 3 show some typical test setups. You can use other setups, as long as you observe the following rules:

1. Connect the ultrasound probe you are testing to the probe adapter. See the list of available adapters under Accessories.
2. Place the probe you are testing in a saline bath with the entire critical area of the probe fully immersed.
3. Place the dual electrode (Part No. 2392502 or 2392569) in the saline bath to a depth of at least one inch.

4. Plug the probe adapter and the electrode wire connectors into the ULT800. The connections are fully interchangeable.

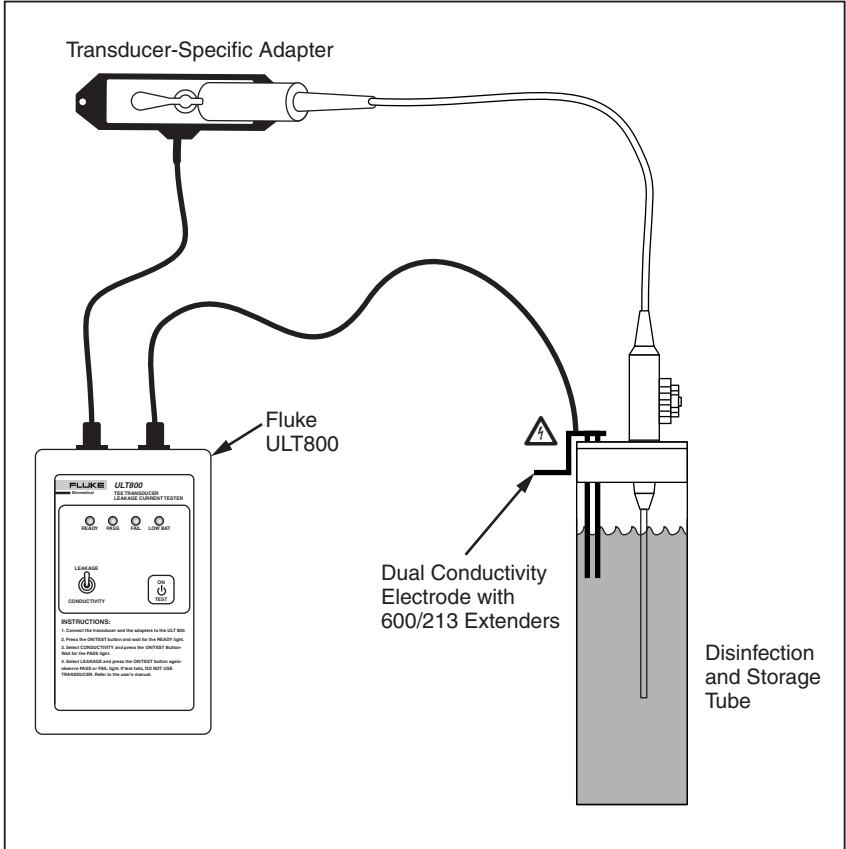


**Figure 2. Disinfection Basin Test Setup**

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# Ultrasound Transducer Leakage Current Tester Using the ULT800



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**Figure 3. Disinfection/Storage Tube Setup**

## Checking the Battery

### *Note*

The **LOW BAT** light flashes red to indicate that the battery needs replacement.

1. Use the **LEAKAGE/CONDUCTIVITY** switch to select **CONDUCTIVITY**.
2. Press the **ON/TEST** button to turn on the ULT800.

The self-check routine starts, calibrating the unit. All four LED indicators flash in sequence, continuing for five cycles. The **READY** light glows amber when the self-test routine completes with a successful battery test.

## Checking Solution Conductivity

### *Note*

The LED indicating a test result remains on for 12 seconds. The ULT800 then powers off to conserve the battery. To resume testing, power on the ULT800, allow the self-check/battery test to complete, and then reinitiate the test.

1. Select **CONDUCTIVITY**.
2. Press the **ON/TEST** button to perform a measurement cycle.
3. At the end of the measurement cycle (two seconds), the LED indicates the results of the test.

The green **PASS** light illuminates if the solution passed the Conductivity Test. The red **FAIL** light illuminates if the solution failed the Conductivity Test. Check that you have immersed the electrodes to a depth of at least 25 mm (1 inch) and that they are firmly connected to the ULT800, then retest. If the failure repeats, replace the solution and then retest.

## **Testing for Transducer Leakage Current**

### *Note*

*Perform the Leakage Test only if the Conductivity Test passes.*

1. Select **LEAKAGE**.
2. Press the **ON/TEST** button to perform a leakage measurement.

The green **PASS** light illuminates if the transducer passed the leakage current test. The red **FAIL** light illuminates if the transducer failed the leakage current test. If there is less than 20  $\mu\text{A}$  of leakage current, the red light pulses, indicating a possible open circuit condition with invalid test results.

## **Maintenance**

Your ULT800 needs little maintenance or special care. However, treat it as a calibrated measuring instrument. Avoid dropping or other mechanical abuse that could cause a shift in the calibrated settings.

## **Cleaning**

### **⚠ Caution**

**Do not pour fluid onto the ULT800 surface; fluid seepage into the electrical circuitry may cause ULT800 failure.**

### **⚠ Caution**

**Do not use spray cleaners on the ULT800; such action may force cleaning fluid into the ULT800 and damage electronic components.**

Clean the ULT800 occasionally utilizing a damp cloth and mild detergent. Take care to prevent the entrance of liquids.

Wipe down the adapter cables with the same care. Inspect them for damage to and deterioration of the insulation. Check the connections for integrity. Keep transducer adapter clean and dry.

## **Battery**

### **⚠ Warning**

**The 9-volt alkaline battery provided with the ULT800 may explode or leak if recharged, inserted improperly, disposed of in a fire, or mixed with different battery types. Dispose of the battery in accordance with any applicable state or local regulations.**

The ULT800 uses a standard 9-volt alkaline battery. The battery has a life expectancy of approximately 1000 measurements. Replace the battery yearly, regardless of its condition.

## **Calibration**

### **⚠ Warning**

**Examine the calibration label on the back of the ULT800 prior to each use. Do not use a ULT800 with an expired calibration label. A ULT800 without a calibration label or with the anti-tamper case label broken is out of calibration. A ULT800 that is out of calibration can cause excessive leakage current exposure to the patient; risk of injury to the patient could result.**

### **⚠ Caution**

**Avoid dropping the ULT800 or allowing other mechanical abuse that could cause a shift in the ULT800's calibrated settings.**

The ULT800 requires yearly Fluke factory calibration, which uses appropriate tools and reference instruments that are traceable to the National Institute of Standards and Technology (NIST). Factory calibration provides a calibration sticker on the back of the ULT800 to verify that the calibration was performed.

To locate a service center, visit the Fluke web site at [www.fluke.com](http://www.fluke.com), or contact Fluke at [service@fluke.com](mailto:service@fluke.com). Call from anywhere in the world at +1-425-446-5500 or call for service in the USA at 1-888-99-FLUKE (1-888-993-5853.)







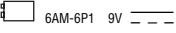
## **Accessories**

Refer to Table 2 for a list of accessories for the ULT800. A list of available transducer-specific adapters are listed on Fluke Biomedical's web site. [www.flukebiomedical.com/electrical\\_safety\\_analyzers/ULT800](http://www.flukebiomedical.com/electrical_safety_analyzers/ULT800)

**Table 2. Accesories**

<b>Part Number</b>	<b>Model Number</b>	<b>Description</b>
2392427	600/102FG	Chassis ground probe, 8-foot coiled cord
2392502	600/212FG	Dual conductivity electrode
2392525	600/214FG	Hard-sided carrying case
2392533	600/215FG	Conductivity cable
2392569	600/220FG	Dual conductivity probe – for use with Cidex 2032 tray.

## **Symbols**

<b>Symbol</b>	<b>Description</b>
	See Users Guide
	Caution: risk of electric shock
	Standby – On
	Manufacturer's declaration of product compliance with applicable EU directives
	UL Listing mark
	Do not mix with solid waste stream. Dispose using a qualified recycler or hazardous material handler.
	9-volt battery