AMPROBE®

LCR55A
Inductance, Capacitance, Resistance Meter

User Manual

LCR55A

3-1/2 digit LCD; decimal point, function and unit indicators

3-1/2 Digit LCD ; Dezimalpunkt, Funktions- und Einheitsanzeigen

LCD de 3-1/2 dígitos, punto decimal, indicadores de función y unidades

LCD 3-1/2 digits ; point décimal, indicateurs de fonctions et d'unités

Zero adjustment for 20Ω range

Nullabgleich für 20Ω Bereich

Ajuste de cero para escala de 20 Ω

Mise-à-zéro pour calibre 20Ω

Low Battery

Batterie entladen

Pila baja

Pile déchargée

Display Hold

Anzeigesperre

Retención de lectura

Maintien de lecture

Max Reading Hold

Max Anzeigesperre

Retención de lectura maxima

Maintien de lecture maximale

Function/Range/Off Selector

Funktion-/Bereich-/Aus Schalter

Selector de Función/Escala/Off

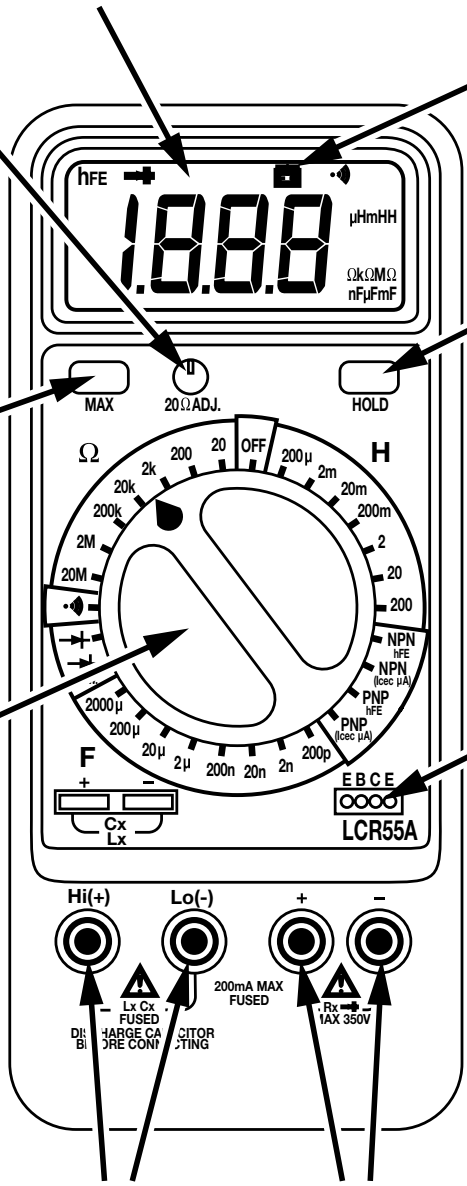
Sélecteur fonctions/ calibres/marche-arrêt

Input terminals for transistor test

Eingänge für Transistortest

Terminales de entrada para prueba de transistors

Entrées pour test de transistors



High (+) and Low (-) inputs for capacitance and inductance measurement

Hoch (+) und Niedrig (-) Eingänge für Kapazitäts- und Induktanzmessung

Entradas alta (+) y baja (-) para medidas de capacidad e inductancia

Entrées haute (+) et basse (-) pour measures de capacité et d'inductance

Positive and negative inputs for resistance and diode test

Positive und negative Eingänge für Widerstandsmessung und Diodentest

Entradas positiva y negativa para medidas de resistencia y prueba de diodos

Entrées positives et négatives pour measures de résistance et test de diodes

AMPROBE®

LCR55A

Inductance, Capacitance, Resistance Meter

Operators Manual

English

PN 1566247

Limited Warranty and Limitation of Liability

Your Amprobe product will be free from defects in material and workmanship for 1 year from the date of purchase. This warranty does not cover fuses, disposable batteries or damage from accident, neglect, misuse, alteration, contamination, or abnormal conditions of operation or handling. Resellers are not authorized to extend any other warranty on Amprobe's behalf. To obtain service during the warranty period, return the product with proof of purchase to an authorized Amprobe Test Tools Service Center or to a Amprobe dealer or distributor. See Repair Section above for details. THIS WARRANTY IS YOUR ONLY REMEDY. ALL OTHER WARRANTIES - WHETHER EXPRESS, IMPLIED OR STAUTORY - INCLUDING IMPLIED WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE OR MERCHANTABILITY, ARE HEREBY DISCLAIMED. MANUFACTURER SHALL NOT BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES OR LOSSES, ARISING FROM ANY CAUSE OR THEORY. Since some states or countries do not allow the exclusion or limitation of an implied warranty or of incidental or consequential damages, this limitation of liability may not apply to you.

Inductance, Capacitance, Resistance Meter

Contents

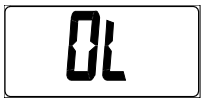
Symbols

	Battery	⚠	Refer to the manual
	Double insulated		Audible tone
	Fuse	CE	Complies with EU directives
	Conforms to relevant Australian standards		

Warnings and Precautions

- **Do not exceed the maximum overload limits per function (see specifications) nor the limits marked on the instrument itself.**
- **Exercise extreme caution when: measuring voltage >20V .**
- **Inspect DMM, test leads and accessories before every use. Do not use any damaged part.**
- **Never ground yourself when taking measurements. Do not touch exposed circuit elements or probe tips.**
- **Do not operate instrument in an explosive atmosphere.**
- **Clean instrument with mild detergent only.**

Overload Indication



Range overload is indicated by a "OL" in the display with all other digits blanked. Overload indication is normal in the OHMS range with open circuit or too high a resistance.

Preparation for Use – Unpacking

Your shipping carton should include the LCR55A, one test lead set (one black, one red), one pair of alligator clips, one 9V battery (installed), one spare 0.1A/250V fuse (inside the case), one holster, a warranty card and this manual. If any item is damaged or missing, return to the place of purchase for an exchange.

Measuring Procedures

General Procedures

1. When connecting or disconnecting test leads to/from a circuit, always first turn off power to device or circuit being tested and discharge all capacitors.
2. If the magnitude of a signal to be measured is not known, set selector switch to highest range first and reduce until satisfactory reading is obtained.
3. Strictly observe the max input limits.

Resistance Measurement (Fig. -1-)

1. Turn off power to the resistance to be measured and discharge any capacitors. Any voltage present during a resistance measurement will cause inaccurate readings.
2. Connect red test lead to +Rx Input and black test lead to -Rx Input.
3. Set Function/Range Switch to the desired Ω position.
4. Connect test leads to resistance or circuit to be measured.
5. Read resistance value on Digital Display. Open circuits will be displayed as an overload condition.

Note: On the 20Ω range, an adjustment potentiometer (ZERO ADJ.) allows you to zero out the test lead resistance. Short test leads and adjust the knob until the display reads zero.

Diode and Transister Test (Fig. -2-)

The diode test measures the voltage drop across the diode junction.

4. Connect the red test lead to the +Rx Input and the black test lead to the –Rx Input.
5. Set the Function/range switch to ⇥ or to ⇥ M.W. position (to test diodes found in microwave ovens).
6. Apply probe tip of red lead to the anode and black lead to the cathode of the diode. The meter's display indicates the forward voltage drop (approximately 0.7V for silicon diode or 0.4V for germanium diode). Meter will display overload condition for an open diode.
7. Reverse test lead connections to the diode to perform a reverse bias test. Overload indicates a good diode.

Note: Overload condition for both reverse and forward bias tests indicate an open diode. A low voltage reading for both bias tests indicates a shorted diode. If the diode is shunted by a resistor of 1000 ohms or less, it must be removed from the circuit before taking the measurement. Bipolar transistor junctions may

be tested in the same manner described above.

Note: The test procedure of microwave oven diodes is identical to regular diodes except forward voltage drop will be higher (3 or more volts) than standard silicon diodes. LEDs may also be tested with the LCR55A in the M.W. position.

Continuity Test

The Continuity test checks electrical continuity between two contact points.

1. Set the Function/Range switch to))).
2. Plug the black test lead into the –Rx jack and connect the test lead tip to one of the contact points.
3. Plug the red test lead into the +Rx jack and connect its test lead point to the other contact point. (See Figure 1 for connections).
4. The internal beeper emits a tone when resistance is less than approx. 30Ω.

Capacitance Mesurements (Fig. -3-)

1. Discharge all voltage from the capacitor (via a 20kΩ resistor) before measuring its value.
2. Connect the red test lead to the HI(+) input and the black test lead to the Lo(–) input.
3. Set the function/range switch to the capacitance range that gives the best resolution.
4. Apply probe tips to the capacitor leads
5. Read the capacitance value on the display (you may have to wait a few seconds until the capacitor is fully charged). If "OL" appears in the highest range, the capacitor is too large to be measured.

Note: Small value capacitors can also be measured by inserting their leads directly into the Cx/Lx slots in the meter.

Note:The capacitance range is protected by a 0.1A/250V fast blow fuse. If fuse blows, replace with same (see Battery and Fuse Replacement).

Note: The LCR55A has a residual capacitance of approximately 6pF in the 200nF range. When using the 200nF range, note the residual capacitance and subtract this value from the measured value.

Inductance Measurement

1. Connect the red test lead to the HI(+) input and the black test lead to the Lo(–) input.
2. Set the function/range switch to the inductance range that gives the best resolution.
3. Apply probe tips to the inductor leads.
4. Read the inductance value on the display. If "OL" appears in the highest range, the inductor is too large to be measured.

Note: Small value inductors can also be measured by inserting their leads directly into the Cx/Lx slots in the meter.

Note: The inductance range is protected by a 0.1A/250V fast blow ceramic fuse. If fuse blows, replace with same (see Battery and Fuse Replacement).

Transistor Gain Measurement

The Transistor must be out of circuit.

1. Set the Function/Range switch to the PNP(hFE) or NPN(hFE) position, according to the type of transistor to be measured.
2. Plug the emitter, base and collector leads of the transistor into the correct holes of test socket.
3. Read the hFE beta, (DC current gain) in the display.

Note: To measure the collector-emitter current, set the function/range switch to the corresponding PNP(Icec μA) or NPN(Icec μA) position.

MAX Function
Push the MAX button to keep only the highest reading on the display. The display is updated each time a higher value is encountered. Push MAX again to release the display and to display current values.

Hold Function
Press the HOLD button to maintain a reading on the display. The reading is maintained even when the probe tips are removed from the meter. Pushing the HOLD button again releases the display.

Safety Test Leads
The test leads included with your meter have shrouded banana plugs to eliminate the possibility of shock if the plugs accidentally pull out of the meter while making a measurement. Always inspect the test leads for damage before making any measurements.

Specifications

General Specifications
Display: 3 1/2 digit LCD, 1999 counts, 0.7" (17.8mm) high numerals, unit annunciators and function symbols
Polarity Indication: Automatic, positive implied, negative indicated
Zero Adjustment: Automatic
Overrange Indication: "OL"
Low Battery Indication: is displayed when the battery voltage drops below accurate operating level. Change battery immediately.
Display Update Rate: 2.5 per second, nominal
Operating Temperature: 0°C to 50°C, 0 to 70% Relative Humidity
Storage Temperature: -20°C to 60°C, 0 to 80% RH with battery removed
Temperature coefficient: 0.1 x (spec. accur.) per °C (0-18°C, 28-50°C)
Power: Standard 9-volt transistor battery, NEDA 1604, JIS 006P, IEC 6F22
Auto Power Off: 60 minutes after no function or range change
Battery Life (Typical): 30 hours alkaline (changes with function and application)
Dimensions (H x W x D): 18.3 x 7.9 x 3.8 cm, (7.2 x 3.1 x 1.5 inches)
Weight (including battery): 311 grams (11 ounces)
Accessories: Test leads, 0.1A/250V spare fuse, battery, one pair of alligator clips and Operator's Manual.

Agency Approvals: CE EMC

This product complies with requirements of the following European Community Directives: 89/336/EEC (Electromagnetic Compatibility) and 73/23/EEC (Low Voltage) as amended by 93/68/EEC (CE Marking).

However, electrical noise or intense electromagnetic fields in the vicinity of the equipment may disturb the measurement circuit. Measuring instruments will also respond to unwanted signals that may be present within the measurement circuit. Users should exercise care and take appropriate precautions to avoid misleading results when making measurements in the presence of electronic interference

Electrical Specifications
Accuracies at 23°C ± 5°C, <75% RH.

Resistance

Ranges: 20, 200Ω, 2, 20, 200kΩ, 2, 20MΩ

Resolution, 20Ω range: 10mΩ

Accuracy: 20Ω range: ±1.2% rdg (zero adjust)

200Ω range: ±0.5% rdg +3dgt

2k to 2MΩ rgs: ±(0.5% rdg +1dgt)

20MΩ rg: ±(2.0% rdg +2dgt)

OL Protection, all ranges: 350VDC or AC RMS

Open Circuit Voltage; 20Ω range: 6.5VDC; 200Ω range: 3.0VDC; other ranges: 1.2VDC

Continuity

Audible Indication, 2kΩ rg: at R ≤30Ω

Response time: 800ms approx

OL Protection: 350VDC or AC RMS

Diode Test

Test Current: 1mA (approx.)

Test Voltage: 3.0VDC typical

Accuracy: ±(1.5%rdg +1dgt)

Display: Forward Junction Voltage

OL Protection: 350VDC or AC RMS

Micro Wave Diode Test

Test Current: 1.3mA (approx.)
Test Voltage: 8.0VDC typical
Accuracy: ±(3.0%rdg +1dgt)
Display: Forward Junction Voltage

OL Protection: 350VDC or AC RMS

Capacitance

Ranges: 200pF, 2, 20, 200nF, 2, 20, 200, 2000µF

Accuracy*:200pF to 200nF: ±(1.0% rdg +3dgt)

2µF to 200µF rgs: ±(2.0% rdg +3dgt)
2000µF range: ≤1000µF ±(3.0% rdg +3dgt)

>1000µF ±(5.0% rdg +5dgt)

Note: In lower ranges, substract 6 points residual offset reading from result

Test Frequency: 200p to 2µF: 1000Hz; 20, 200µF ranges: 100Hz; 2000µF range: 10Hz

Temperature Coefficient: ≤0.5µF: 0.1%/°C; >0.5µF: 0.2%/°C

OL Protection: 0.1A/250V fast blow fuse.

Inductance

Ranges: 200µH, 2, 20, 200mH, 2, 20, 200H

Accuracy: 200µH rg: ±(5.0%rdg +30dgt)*

2 to 200mH: ±(3.0% +20dgt)*

2 to 200H: ±(5.0% +20dgt)*

*For values of Q ≤7

Test Frequency: 200µH to 2H rgs: 1000Hz; 20 and 200H ranges: 100Hz

Temperature Coefficient, ≤0.5H: 0.2%/°C; >0.5H: 0.5%/°C

OL Protection: 0.1A/250V fast blow fuse

Transistor Test

hFE Range: 0-1000

hFE Base Current: 5µA approx.

hFE Voltage C-E: 3.0VDC approx.

I_{ceo} Range, Leakage Current: 10nA to 20µA

Optional Accessories

VC221B Vinyl Carrying Case (for meter and holster)

DL243D Standard Test Lead Set

DL248D Deluxe Test Lead Set

TL36A Replacement Test Leads with Alligator Clips

Troubleshooting/Maintenance

If there appears to be a malfunction during the operation of the meter, the following steps should be performed in order to isolate the cause of the problem:

Check the battery.

Review the operating instructions for possible mistakes in operating procedure.

Inspect and test the Test Probes for a broken or intermittent connection.

Inspect and test the fuse. See Fuse Replacement.

Except for the replacement of the battery or fuse, repair of the multimeter should be performed only by a Factory Authorized Service Center or by other qualified instrument service personnel.

The front panel and case can be cleaned with a mild solution of detergent and water. Apply sparingly with a soft cloth and allow to dry completely before using.

Battery/Fuse Replacement

⚠ Warning

To prevent electrical shock hazard, turn off the multimeter and any device or circuit under test and disconnect the test leads before removing the rear cover.

1. Remove the screws and lift off the rear case.
2. **Fuse Replacement:** Remove the blown fuse (5 x 20mm) from the fuse holder. Replace with a 0.1A/250V quick acting glass fuse (one spare fuse is located on the right side of the battery compartment). Amprobe replacement fuse part number is FP 125.
3. **Battery replacement:** Remove battery and replace with NEDA type 1604 or equivalent 9volt alkaline battery.
4. Reassemble the instrument.

⚠ Warning

Use of an incorrect fuse could result in serious injury or even death. Failure to turn off the multimeter before installing the battery could result in damage to instrument and battery.

Repair

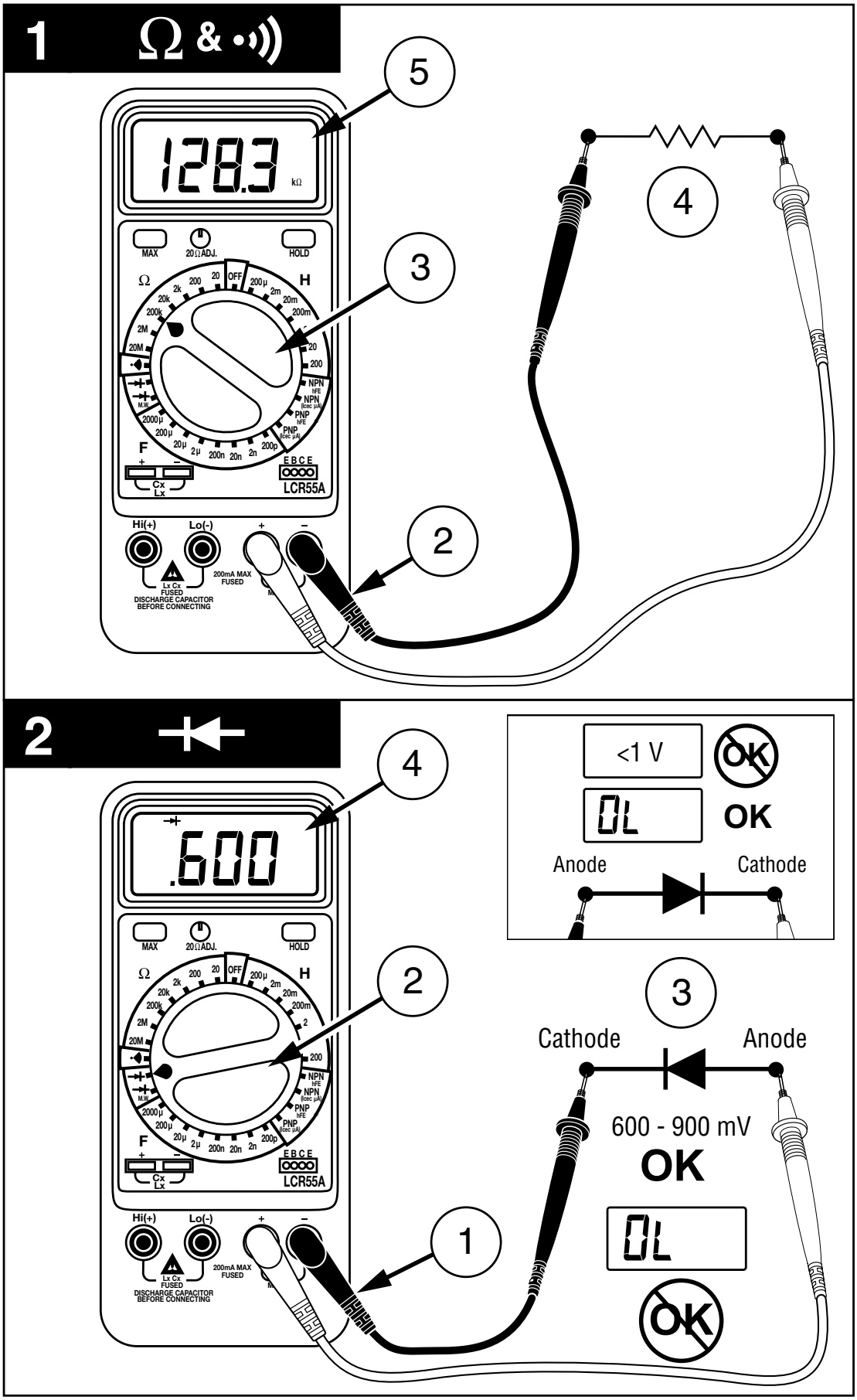
All test tools returned for warranty or non-warranty repair or for calibration should be accompanied by the following: your name, company's name, address, telephone number, and proof of purchase. Additionally, please include a brief description of the problem or the service requested and include the test leads with the meter. Non-warranty repair or replacement charges should be remitted in the form of a check, a money order, credit card with expiration date, or a purchase order made payable to Amprobe Test Tools.

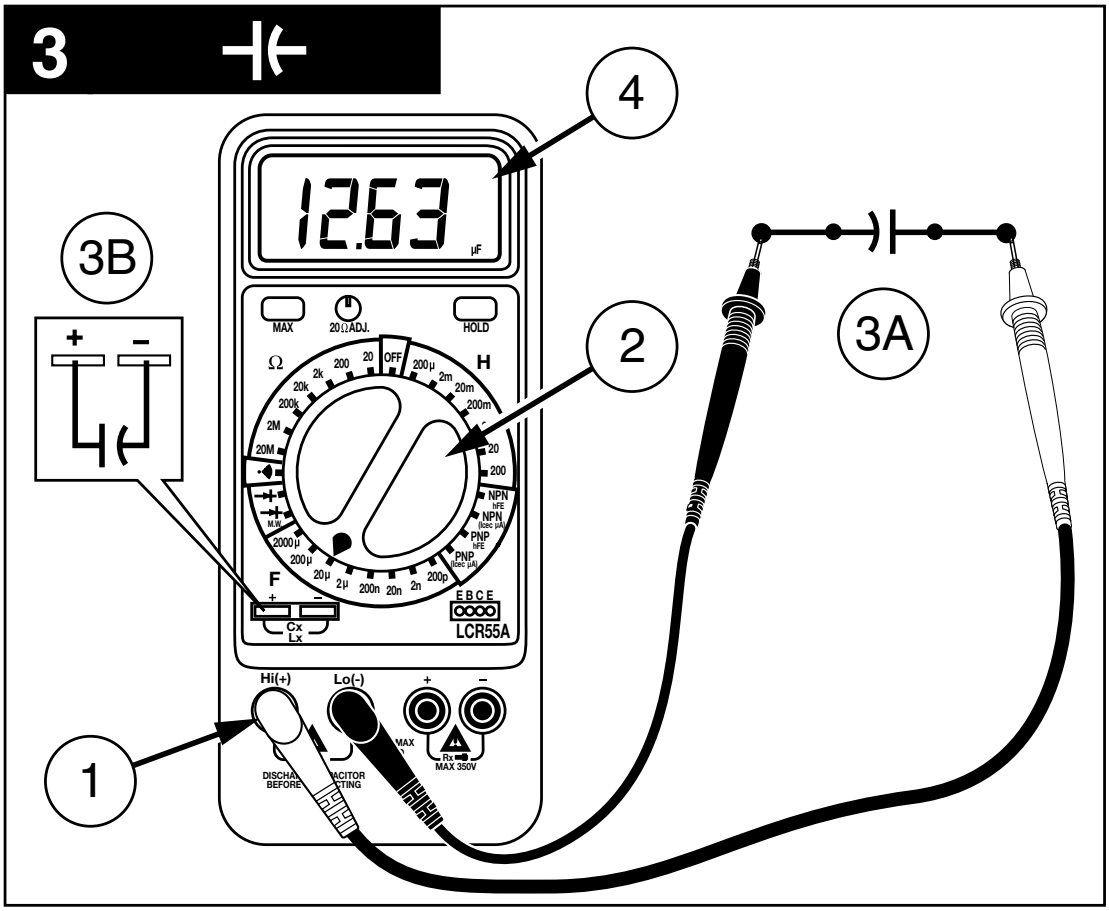
In-Warranty Repairs and Replacement – All Countries

Please read the warranty statement and check your battery before requesting repair. During the warranty period any defective test tool can be returned to your Amprobe Test Tools distributor for an exchange for the same or like product.

Non-Warranty Repairs and Replacement – US and Canada

Non-warranty repairs in the United States and Canada should be sent to a Amprobe Test Tools Service Center. Call Amprobe Test Tools or inquire at your point of purchase for current repair and replacement rates.


1
Ω & •))
5
128.3
kΩ
MAX
20ΩADJ.
HOLD
3
4
2
Hi(+)
Lo(-)
200mA MAX FUSED
Lx Cx FUSED
DISCHARGE CAPACITOR BEFORE CONNECTING
LCR55A
2
4
.600
<1 V
OK
OL
OK
Anode
Cathode
2
3
Cathode
Anode
600 - 900 mV
OK
OL
1


3
4
12.63
µF
3B
3A
2
1
MAX
20Ω ADJ.
HOLD
OFF
LCR55A
Hi(+)
Lo(-)
MAX 350V