

# **15B & 17B**

Digital Multimeters

## Calibration Manual

PN 2061398

May 2003

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# 15B & 17B Digital Multimeter

## Introduction

### Warning

To avoid electric shock or injury:

- Do not perform the performance tests or adjustment procedures described in this manual unless you are qualified to do so.
- The information provided in this manual is for the use of qualified personnel only.
- Read “Safety Information” before using this Meter.

The Fluke 15B and 17B Multimeters (hereafter referred to as “the Meter”) are battery operated, 4,000 count instruments, with a digital display.

Except where noted, the descriptions and instructions in this manual apply to both models of the Meter.

All illustrations show the 17B Multimeter, unless noted otherwise.

## Contact Information

To contact Fluke, call:

+86-10-65123435 ext 15 in China  
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For additional information about Fluke, its products, and services, visit Fluke’s web site at: [www.fluke.com](http://www.fluke.com) .

## Safety Information

The Meters comply with IEC 1010-1 CAT I 1000 V, CAT II 600 V, and CAT III 300 V overvoltage standards. Refer to “Specifications” for more information.

In this manual, a **Warning** identifies conditions and actions that pose hazards to the user.

A **Caution** identifies conditions and actions that may damage the Meter or the equipment under test.

International symbols used on the Meter and in this manual are explained in Table 1.

### Warning

**To avoid possible electric shock or personal injury, and to avoid possible damage to the Meter or to the equipment under test, comply with the following practices:**

- Do not use the Meter in a manner not specified by this manual or the safety features of the Meter may be impaired.
- Before using the Meter, inspect the case. Do not use the Meter if it is damaged. Look for cracks or missing plastic. Pay particular attention to the insulation around the connectors.
- Inspect the test leads for damaged insulation or exposed metal. Check the test leads for continuity. Replace damaged test leads before using the Meter.
- Verify a Meter’s operation by measuring a known voltage. Do not use the Meter if it operates abnormally. Protection may be impaired. When in doubt, have the Meter serviced.
- Do not apply more than the rated voltage, as marked on the Meter, between the terminals or between any terminal and earth ground.
- Use caution when working with voltages above 30 V ac rms, 42 V ac peak, or 60 V dc. These voltages pose a shock hazard.
- Use the proper terminals, function, and range for all measurements.
- Do not operate the Meter around explosive gas, vapor, or dust.
- When using the probes, keep the fingers behind the finger guards.
- When making connections, connect the common test lead before connecting the live test lead; when disconnecting, disconnect the live test lead before disconnecting the common test lead.
- Disconnect circuit power and discharge all high-voltage capacitors before testing resistance, continuity, diodes, or capacitance.

- For all dc functions, including manual or auto-ranging, to avoid the risk of shock due to possible improper reading, verify the presence of any ac voltages by first using the ac function. Then select a dc voltage range equal to or greater than the ac range.
- Before measuring current, check the Meter’s fuses (see “Testing the Fuses”) and turn OFF power to the circuit before connecting the Meter to the circuit.
- Do not operate the Meter with the case (or part of the case) removed.
- Use only two AA batteries, properly installed in the Meter case, to power the Meter.
- Replace the battery as soon as the battery indicator (🔋) appears. With a low battery, the Meter might produce false readings that can lead to electric shock and personal injury.
- Do not measure voltages above 600 V in Category II, or 300 V in Category III installations.
- When in REL mode the  $\Delta$  symbol is displayed. Caution must be used because hazardous voltage may be present.
- Remove test leads from the Meter before opening the Meter case or battery door.
- When servicing the Meter, use only specified replacement parts.

Table 1. International Electrical Symbols

	AC (Alternating Current)		Earth Ground
	DC (Direct Current)		Fuse
	AC or DC		Double Insulated
	Safety Information		Shock Hazard
	Battery		Complies with EU directives

## General Specifications

<b>Maximum Voltage between any Terminal and Earth Ground:</b>	1000 V
<b>⚠ Fuse Protection for mA <math>\mu</math>A inputs:</b>	500 mA, 1000 V FAST, Min. Interrupt Rating 20,000 A
<b>⚠ Fuse Protection for A input:</b>	10 A, 1000 V FAST, Min. Interrupt Rating 20,000 A
<b>Display:</b>	Digital: 4000 count updates 3/sec
<b>Temperature:</b>	Operating: 0 °C to 40 °C, Storage: -30 °C to 60 °C indefinitely (to -40 °C for 100 hours)
<b>Operating Altitude:</b>	0 to 2000 meters
<b>Temperature Coefficient:</b>	0.1 X (specified accuracy)/ °C (<18 °C or >28 °C)
<b>Electromagnetic Compatibility:</b>	Complies with FCC Part 15, Class B, IEC 61326, 3 V/m, performance criterion B
<b>Rated Transient Overvoltage:</b>	4 kV (1.2 x 50 $\mu$ s) Peak for measurement Categories I, II, and III.
<b>Relative Humidity:</b>	Noncondensing < 10 °C 90% from 10 °C to 30 °C; 75% from 30 °C to 40 °C
<b>Relative Humidity, 40 M<math>\Omega</math> Range:</b>	80% from 10 °C to 30 °C; 70% from 30 °C to 40 °C
<b>Battery Type:</b>	2 X AA, NEDA 15A, IEC LR6
<b>Battery Life:</b>	Alkaline: 500 Hours
<b>Size (H x W x L):</b>	180 mm x 89 mm x 51.5 mm (with holster)
<b>Weight:</b>	425 grams
<b>Certifications:</b>	CMC, C $\epsilon$
<b>Safety Compliance:</b>	IEC 61010-1, 2000 CAT I 1000 V, CAT II 600 V, and CAT III 300 V overvoltage standards
<b>Overvoltage installation categories per IEC 61010-1, 2000:</b> The Meter is designed to protect against transients in these categories:	
<p><b>CAT I:</b> From high-voltage low-energy sources, e.g., electronic circuits or a copy machine.</p> <p><b>CAT II:</b> From equipment supplied from the fixed installation, e.g., Televisions, PCs, portable tools and household appliances.</p> <p><b>CAT III:</b> From equipment in fixed equipment installations, e.g., installation panels, feeders and short branch circuits, and lighting systems in large buildings.</p>	

## Accuracy Specifications

Accuracy is specified for 1 year after calibration, at operating temperatures of 18 °C to 28 °C, relative humidity at 0 % to 75 %.

Accuracy specifications take the form of:  $\pm$ ([% of Reading] + [Number of Least Significant Digits])

Function	Range	Resolution	Accuracy	
			Model 15B	Model 17B
AC Volts (40 to 500 Hz) 	400.0 mV <sup>1</sup>	0.1 mV	3.0 % + 3	3.0 % + 3
	4.000 V	0.001 V	1.0 % + 3	1.0 % + 3
	40.00 V	0.01 V		
	400.0 V	0.1 V		
	1000 V	1 V		
DC Millivolts 	400.0 mV	0.1 mV	1.0 % + 10	1.0 % + 10
DC Volts 	4.000 V	0.001 V	0.5 % + 3	0.5 % + 3
	40.00 V	0.01 V		
	400.0 V	0.1 V		
	1000 V	1 V		
Diode Test <sup>2</sup> 	1.000 V	0.001 V	10 %	
Temperature <sup>3</sup> °C (K-type thermocouple)	50 °C to 400 °C	0.1 °C	NA	2 % + 1 °C
	0 °C to 50 °C			± 2 °C
	-55 °C to 0 °C			9 % + 2 °C
Resistance (Ohms) 	400.0 Ω	0.1 Ω	0.5 % + 3	0.5 % + 3
	4.000 kΩ	0.001 kΩ	0.5 % + 2	0.5 % + 2
	40.00 kΩ	0.01 kΩ	0.5 % + 2	0.5 % + 2
	400.0 kΩ	0.1 kΩ	0.5 % + 2	0.5 % + 2
	4.000 MΩ	0.001 MΩ	0.5 % + 2	0.5 % + 2
	40.00 MΩ	0.01 MΩ	1.5 % + 3	1.5 % + 3
Capacitance <sup>4</sup> 	50.00 nF	0.01 nF	2 % + 5	2 % + 5
	500.0 nF	0.1 nF	2 % + 5	2 % + 5
	5.000 μF	0.001 μF	5 % + 5	5 % + 5
	50.00 μF	0.01 μF	5 % + 5	5 % + 5
	100.0 μF	0.1 μF	5 % + 5	5 % + 5
Frequency <b>Hz</b> (10 Hz – 100 kHz)	50.00 Hz	0.01 Hz	NA	0.1 % + 3
	500.0 Hz	0.1 Hz		
	5.000 kHz	0.001 kHz		
	50.00 kHz	0.01 kHz		
	100.0 kHz	0.1 kHz		
Duty Cycle	0.1 % to 99.9 %	0.1%	NA	1% typical <sup>5</sup>
<ol style="list-style-type: none"> <li>1. Manual Range only</li> <li>2. Diode test open circuit test voltage is 1.1 V to 1.6 V and short circuit current is &lt; 0.6 mA (typical).</li> <li>3. Temperature specifications do not include thermocouple errors. After inserting the thermocouple plug into the meter, allow several minutes for thermal stabilization.</li> <li>4. Specifications do not include errors due to test lead capacitance and capacitance floor (may be up to 1.5 nF in the 50 nF range). For the 17B, errors can be reduced by using the relative feature.</li> <li>5. For values between 10% and 90% duty cycle at 50 Hz.</li> </ol>				

Function	Range	Resolution	Accuracy	
			Model 15B	Model 17B
AC Current (40 to 200 Hz) $\tilde{\mu}\text{A}$	400.0 $\mu\text{A}$ 4000 $\mu\text{A}$	0.1 $\mu\text{A}$ 1 $\mu\text{A}$	1.5 % + 3	1.5 % + 3
AC Current (40 to 200 Hz) $\tilde{\text{mA}}$	40.00 mA 400.0 mA	0.01 mA 0.1 mA	1.5 % + 3	1.5 % + 3
AC Current (40 to 200 Hz) $\tilde{\text{A}}$	4.000 A <sup>6</sup> 10.00 A	0.01 A 0.01 A	1.5 % + 3	1.5 % + 3
DC Current $\overline{\mu}\text{A}$	400.0 $\mu\text{A}$ 4000 $\mu\text{A}$	0.1 $\mu\text{A}$ 1 $\mu\text{A}$	1.5 % + 3	1.5 % + 3
DC Current $\overline{\text{mA}}$	40.00 mA 400.0 mA	0.01 mA 0.1 mA	1.5 % + 3	1.5 % + 3
DC Current $\overline{\text{A}}$	4.000 A <sup>6</sup> 10.00 A	0.01 A 0.01 A	1.5 % + 3	1.5 % + 3

6. When in the 4A range, display will show 4000 counts, please ignore the last digit.

Function	Overload Protection	Input Impedance (Nominal)	Common Mode Rejection Ratio	Normal Mode Rejection
AC Volts $\tilde{\text{V}}$	1000 V	>10 M $\Omega$ <100 pF	>60 dB at dc, 50 or 60 Hz	—
DC Volts $\overline{\text{V}}$	1000 V	>10 M $\Omega$ <100 pF	>100 dB at dc, 50 or 60 Hz	>45 dB at 50 or 60 Hz

10<sup>6</sup> V Hz Max

## Performance Tests

### **⚠ ⚠ Warning**

**To avoid electric shock, do not perform the performance test procedures unless the Meter is fully assembled.**

The following performance tests verify the complete operation of the Meter and check the accuracy of each Meter function against its specifications. If the Meter fails any part of the test, adjustment and/or repair is indicated.

In the performance tests, the Meter is referred to as the unit under test (UUT).

Table 2 lists the necessary equipment for the performance tests.

**Table 2. Required Equipment**

Equipment	Recommended Model
AC Calibrator	Fluke 5520A
Digital Thermometer	Fluke 50S with 80Pk-3A Surface Probe
Thermocouple Adapter	80AK K-Type Thermocouple Adapter
3 Volt Lab Power Supply	-
Thermocouple	K-Type with male mini connectors at each end.

### Preparing for the Performance Test

#### **⚠ ⚠ Warning**

**To avoid possible electric shock or personal injury:**

- **Do not perform the following procedures unless qualified to do so. Some procedures involve the use of high voltages.**
- **Before handling the test connections and in between tests, make sure the calibrator is in standby mode (STBY).**

To prepare for the performance test:

1. Make sure to use the required equipment, see Table 2.
2. Warm up the calibrator as required by its specifications.
3. Allow the temperature of the Meter to stabilize at room temperature ( $23\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$  [ $73\text{ }^{\circ}\text{F} \pm 9\text{ }^{\circ}\text{F}$ ]).

### Testing the Display

Turn the UUT on and off several times and observe the display. Make sure that all of the display segments and icons show up as in the Figure 1.

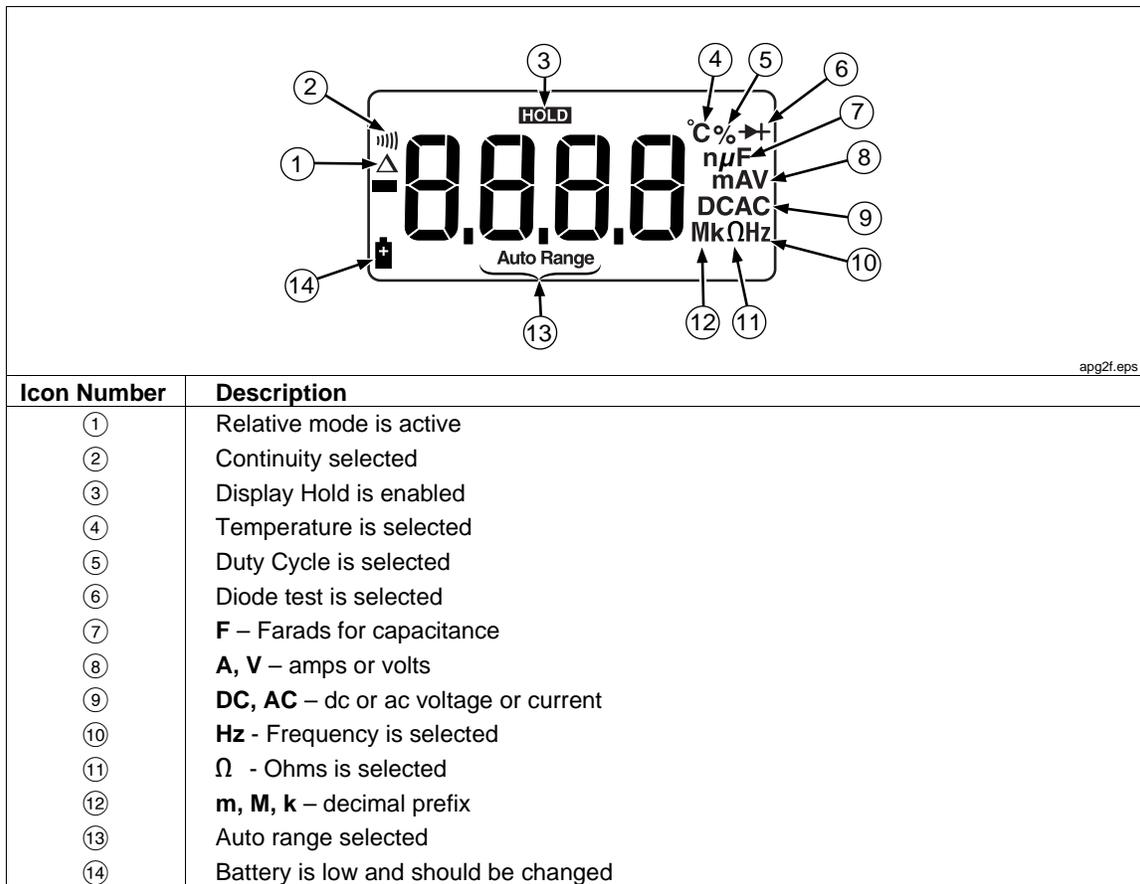


Figure 1. Display

### Performance Test Procedures

To test each of the Meter's functions and operating ranges, do the following:

1. Referring to the performance test tables (Tables 3 and 4), set the Meter to the desired function and range for each test.
2. Connect the source to the appropriate UUT's input jacks.
3. Apply the indicated output from the source.
4. The reading on the UUT display should be within the low and high limits shown in Table 3 or 4.
5. Repeat steps 1-4 for each function and range in the performance test tables.

If the UUT fails to perform within the low-high range indicated for each test in Table 3 or Table 4, adjust the Meter and go through the performance test procedure again. If the UUT still fails to perform within the ranges indicated, then repair is necessary. Refer to "Contacting Fluke" to locate a service center.

**Table 3. 15B Performance Test**

Step	Test Function	Switch Position	Push Button	5520A Output	UUT Reading Limits	
1	Volts AC		N/A	3.5 V 50 Hz	3.462 to 3.538 V ac	
2				35 V 500 Hz	34.62 to 35.38 V ac	
3				350 V 50 Hz	346.2 to 353.8 V ac	
4						
5					1000 V 50 Hz	<b>Auto Range</b> icon OFF <b>OL.</b>
6						987 to 1013 V ac
7						0.35 V 60 Hz
Set 5520A to Standby						
8	Volts DC		N/A	3.5 V dc	3.480 to 3.520 V dc	
9				35 V dc	34.80 to 35.20 V dc	
10				350 V dc	348.0 to 352.0 V dc	
11				-1000 V dc	-992 to -1008 V dc	
Set 5520A to Standby						
12	mV dc		N/A	0.35 V dc	345.5 to 354.5 mV dc	
13	Ohms		N/A	350 Ω	347.9 to 352.1 Ω	
14				3.5 kΩ	3.480 to 3.520 kΩ	
15				35 kΩ	34.80 to 35.20 kΩ	
16				0.35 MΩ	348.0 to 352.0 MΩ	
17				3.5 MΩ	3.480 to 3.520 MΩ	
18				35 MΩ	34.45 to 35.55 MΩ	
19	Diode		○ (once)	0.7 V dc	➤ icon ON 0.630 to 0.770 V dc	
20	Continuity		○ (press again)	40 Ω	⏏ Icon ON Beeper ON	
21	-	-	-	800 Ω	Beeper OFF	

Table 3. 15B Performance Test (cont.)

Step	Test Function	Switch Position	Push Button	5520A Output	UUT Reading Limits
For the 15B Capacitance Test, subtract the test lead capacitance from the UUT reading to get measurement result.					
22	Capacitance		N/A	48 nF	46.99 to 49.01 nF
23				0.48 μF	469.9 to 490.1 μF
24				4.8 μF	4.555 to 5.045 μF
For step 25, wait 15 seconds for the reading to settle.					
25	-	-	-	48 μF	45.55 to 50.45 μF
For step 26, wait 15 seconds for reading to settle.					
26	-	-	-	95 μF	89.7 to 100.3 μF
27	Amps dc		-	3.8 A dc	3.713 to 3.887 A dc
28	-	-	-	-10 A dc	-9.82 to -10.18 A dc
29	Amps ac	-		3.8 A 50 Hz	3.713 to 3.887 A ac
30	-	-	-	10 A, 50 Hz	9.82 to 10.18 A ac
31	mA dc		-	38 mA dc	37.40 to 38.60 mA dc
32	-	-	-	0.38 A dc	374.0 to 386.0 mA dc
33	mA ac	-		0.38 A 50 Hz	374.0 to 386.0 mA ac
34	-	-	-	38 mA 200 Hz	37.40 to 38.60 mA ac
35	μA dc		-	3.8 mA dc	3740 to 3860 μA dc
36	-	-	-	0.38 mA dc	374.0 to 386.0 μA dc
37	μA ac	-		0.38 mA, 40 Hz	374.0 to 386.0 μA ac
38	-	-	-	3.8 mA, 200 Hz	3740 to 3860 μA ac
The Fluke 15B Performance Test is now complete.					

**Table 4. 17B Performance Test**

Step	Test Function	UUT Switch Setting	UUT Push Button	5520A Output	UUT Display limits	
1	Volts AC	$\tilde{V}$	N/A	3.5 V 50 Hz	3.462 to 3.538 V ac	
2				35 V 500 Hz	34.62 to 35.38 V ac	
3				350 V 50 Hz	346.2 to 353.8 V ac	
4				RANGE		
5					1000 V 50 Hz	<b>Auto Range icon OFF</b> <b>OL.</b>
6				RANGE		987 to 1013 V ac
7				RANGE	0.35 V 50 Hz	339.2 to 360.8 mV ac
8				Hz %	1 V 50Hz	49.92 to 50.08 Hz
9				-	1 V 500 Hz	499.2 to 500.8 Hz
10				-	1 V 5 kHz	4.992 to 5.008 Hz
11				-	2 V 50 kHz	49.92 to 50.08 Hz
12				-	3 V 100kHz	99.6 to 100.4 Hz
13				Hz %	3 V 500 Hz	49.0 to 51.0 %
Set 5520 to Standby.						

Table 4. 17B Performance Test (cont.)

Step	Test Function	UUT Switch Setting	UUT Push Button	5520A Output	UUT Display limits
14	Volts DC		N/A	3.5 V dc	3.480 to 3.520 V dc
15				35 V dc	34.80 to 35.20 V dc
16				350 V dc	348.0 to 352.0 V dc
17				1000 V dc	992 to 1008 V dc
18					
19				STANDBY	icon ON -992 to -1008 V dc
20	mV dc		N/A	0.35 V dc	345.5 to 354.5 mV dc
21	Ohms		N/A	350 $\Omega$	347.9 to 352.1 $\Omega$
22				3.5 k $\Omega$	3.480 to 3.520 k $\Omega$
23				35 k $\Omega$	34.80 to 35.20 k $\Omega$
24				350 k $\Omega$	348.0 to 352.0 k $\Omega$
25				3.5 M $\Omega$	3.480 to 3.520 M $\Omega$
26				35 M $\Omega$	34.45 to 35.55 M $\Omega$
27	Diode		(once)	0.7 V dc	icon ON 0.630 to 0.770 V
28	Continuity		(press again)	40 $\Omega$	Icon ON Beeper On
29			-	800 $\Omega$	Beeper OFF
For step 30, disconnect test leads from the calibrator first, then push  when the reading settles. This 'rels out' test lead and meter capacitances.					
30	Capacitance			STANDBY	icon ON 0.00 to 0.02 nF
31			-	48 nF	icon ON 46.99 to 49.01 nF
32			-	0.48 $\mu$ F	icon ON 469.9 to 490.1 $\mu$ F
33			-	4.8 $\mu$ F	icon ON 4.555 to 5.045 nF
For step 34, wait 15 seconds for reading to settle.					
34	Capacitance		-	48 $\mu$ F	icon ON 45.55 to 50.45 $\mu$ F

**Table 4. 17B Performance Test (cont.)**

Step	Test Function	UUT Switch Setting	UUT Push Button	5520A Output	UUT Display limits
For step 35, wait 15 seconds for the reading to settle.					
35	Capacitance		-	95 $\mu$ F	$\Delta$ icon ON 89.7 to 100.3 $\mu$ F
36	Amps DC		N/A	3.8 A dc	3.713 to 3.887 A dc
37				-10 A dc	-9.82 to -10.18 A dc
38	Amps AC		○	10 A 50 Hz	9.82 to 10.18 A ac
39				3.8 A 50 Hz	3.713 to 3.887 A ac
Set 5520A to Standby.					
40	mA dc			38 mA	37.40 to 38.60 mA dc
41			-	0.38 A dc	374.0 to 386.0 mA dc
42	mA ac		○	0.38 A 50 Hz	374.0 to 386.0 mA ac
43			-	38 mA 200 Hz	37.40 to 38.60 mA ac
Set 5520A to Standby.					
44	$\mu$ A dc			3.8 mA	3740 to 3860 $\mu$ A dc
45			-	0.38 mA	374.0 to 386.0 $\mu$ A dc
46	$\mu$ A ac		○	0.38 mA 40 Hz	374.0 to 386.0 $\mu$ A ac
47			-	3.8 mA 200 Hz	3740 to 3860 $\mu$ A ac
Set the 5520A to Standby. Connect 5520A temperature output to UUT V $\Omega$ terminals using 80AK and K type Thermocouple wire with male mini connectors at each end. Refer to Figure 2.					
Wait 3 to 5 minutes before performing steps 48 and 49 to allow test lead thermals to dissipate.					
48	Temperature	$^{\circ}$ C	-	380 $^{\circ}$ C	371.4 to 388.6 $^{\circ}$ C
49			-	-55.0 $^{\circ}$ C	-48.0 to -62.0 $^{\circ}$ C
Performance testing of the 17B is now complete.					

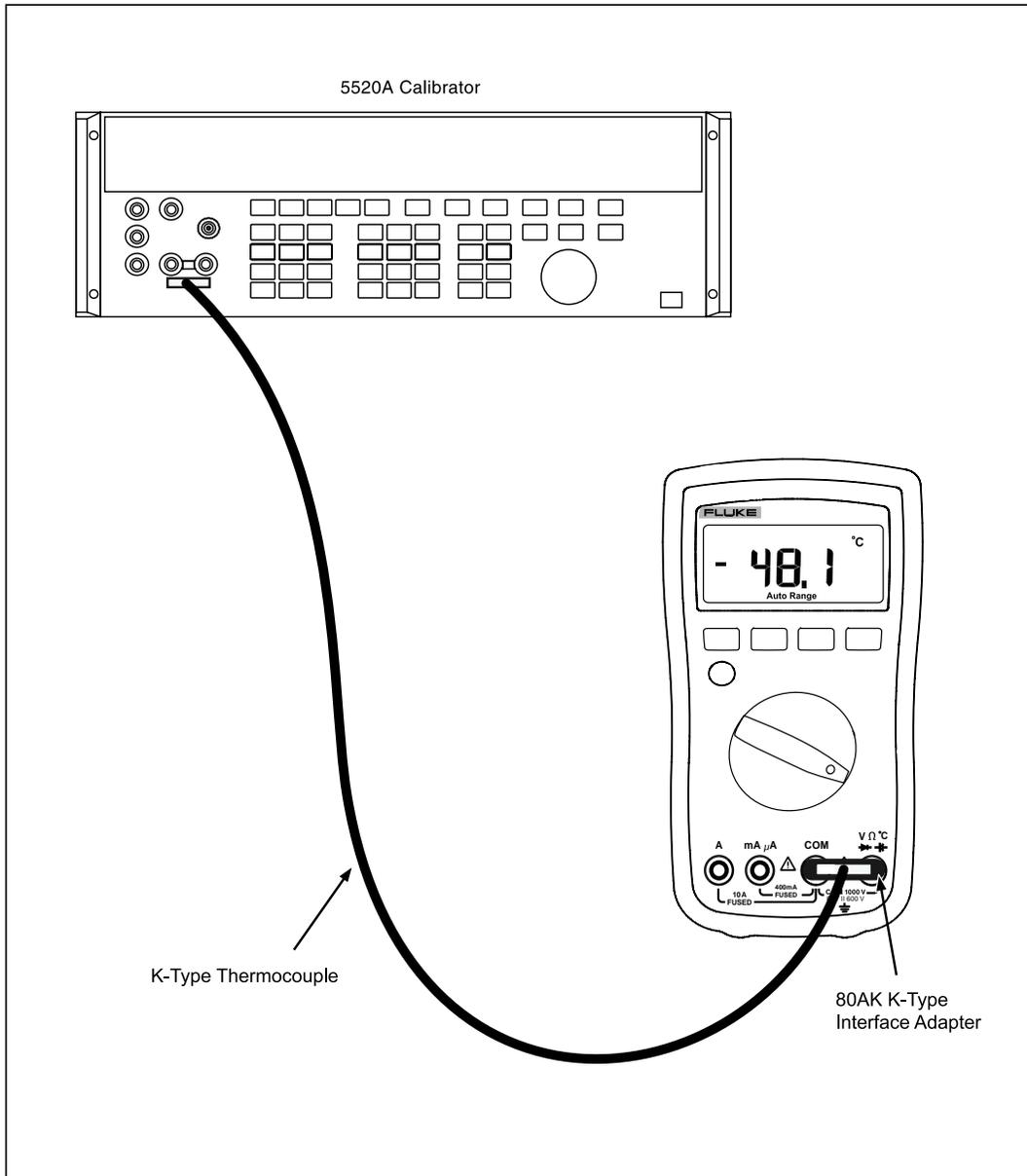


Figure 2. Temperature Performance Test Connections

aes7f.eps

## **Meter Adjustment**

If the Meter fails the performance tests, adjustment may be necessary. Use the steps listed below and refer to Table 5 or 6 to adjust the Meter.

1. Remove the yellow holster by slipping it off of the Meter.
2. Remove the screws on the bottom of the Meter.
3. Lift off the bottom case to gain access to the potentiometers used for Meter adjustment. Refer to Figure 6.
4. Observing correct polarity, connect a 3 V dc lab supply to the meter's battery contacts to power the meter during calibration. Refer to Figure 5 for proper connections.
5. Apply the values listed in Table 5 or 6 and adjust the designated potentiometer as needed.
6. When finished, replace the bottom case.
7. Replace the case screws.
8. Replace the yellow holster.
9. Verify the meter adjustment by going through the performance test procedures. If the Meter still does not meet the performance test specifications, service is required. Refer to "Contacting Fluke" to locate a service center.

### 15B Adjustment

Refer to Table 5 for the 15B adjustment procedure and Figure 3 for the adjustment points.

Table 5. 15B Adjustment

Step	Test Function	Switch	Button	Potentiometer	5520	UUT Test Specifications
1	mV dc Adjustment	$\overline{\text{mV}}$	NO	R18	350 mV dc	349.9 to 350.1 mV dc
For step 2, if the display reads between 34.91 and 35.09 V dc, no adjustment is necessary.						
2	Volts dc Adjustment	$\overline{\text{V}}$	NO	R18	35 V dc	If the display reads less than 34.91, adjust R18 to 34.91 to 34.92 V dc. If the display reads more than 35.09 Adjust R18 to 35.08 to 35.09 V dc.
3	Volts AC Adjustment	$\tilde{\text{V}}$	NO	R8	35 V 50 Hz	If step 2 V dc calibration is less than 35 V dc, adjust R8 to 34.91 to 34.92 V ac. If step 2 V dc calibration is equal to or greater than 35 V dc, adjust R8 to 34.99 to 35.01 V ac.
Set Calibrator to STANDBY.						
4	Capacitance Adjustment	$\overline{\mu\text{F}}$	NO	R11	350 nF	349.0 to 351.0 nF
RESET Calibrator						
5	OFF	OFF				

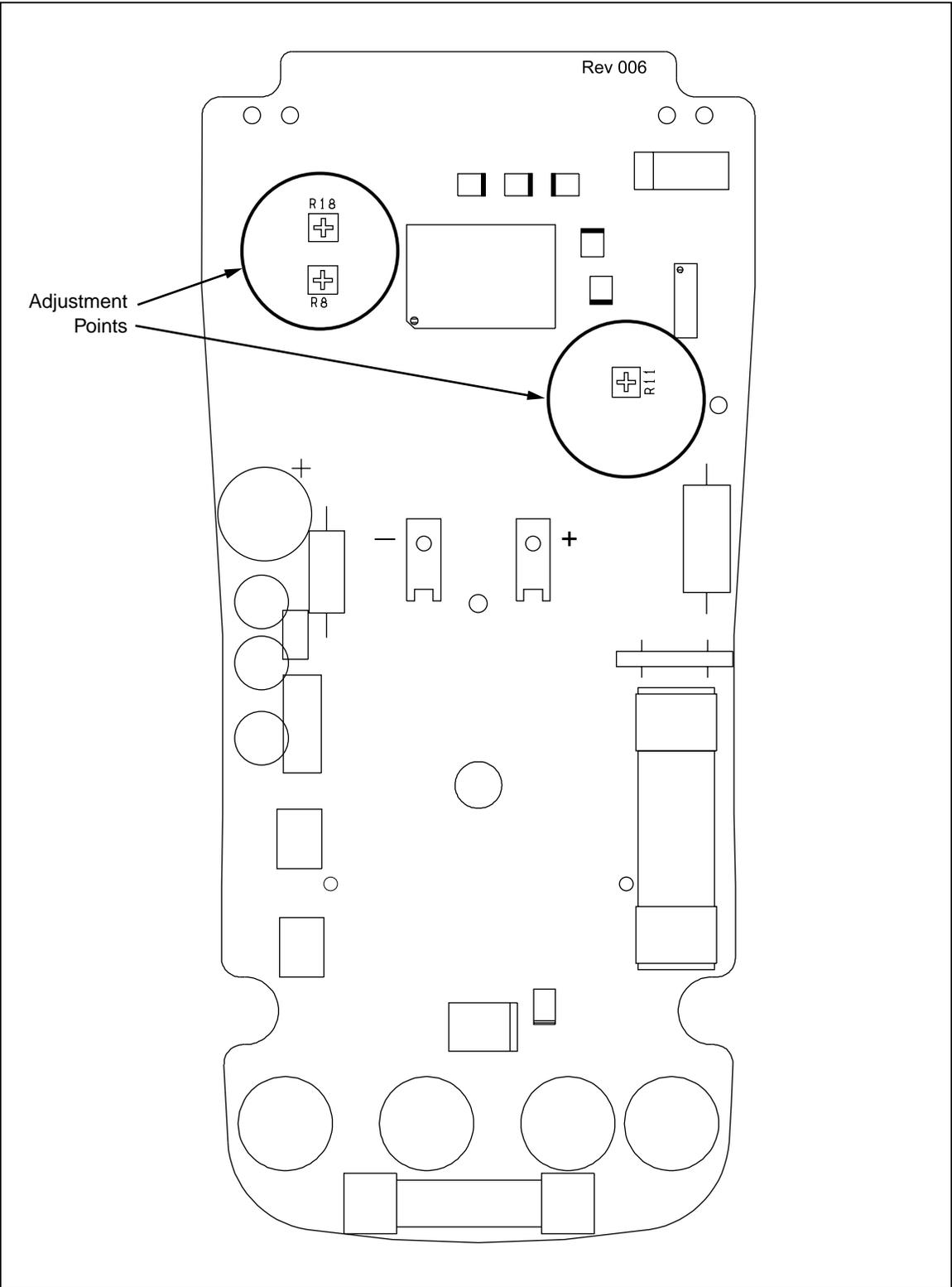


Figure 3. 15B Adjustment Points

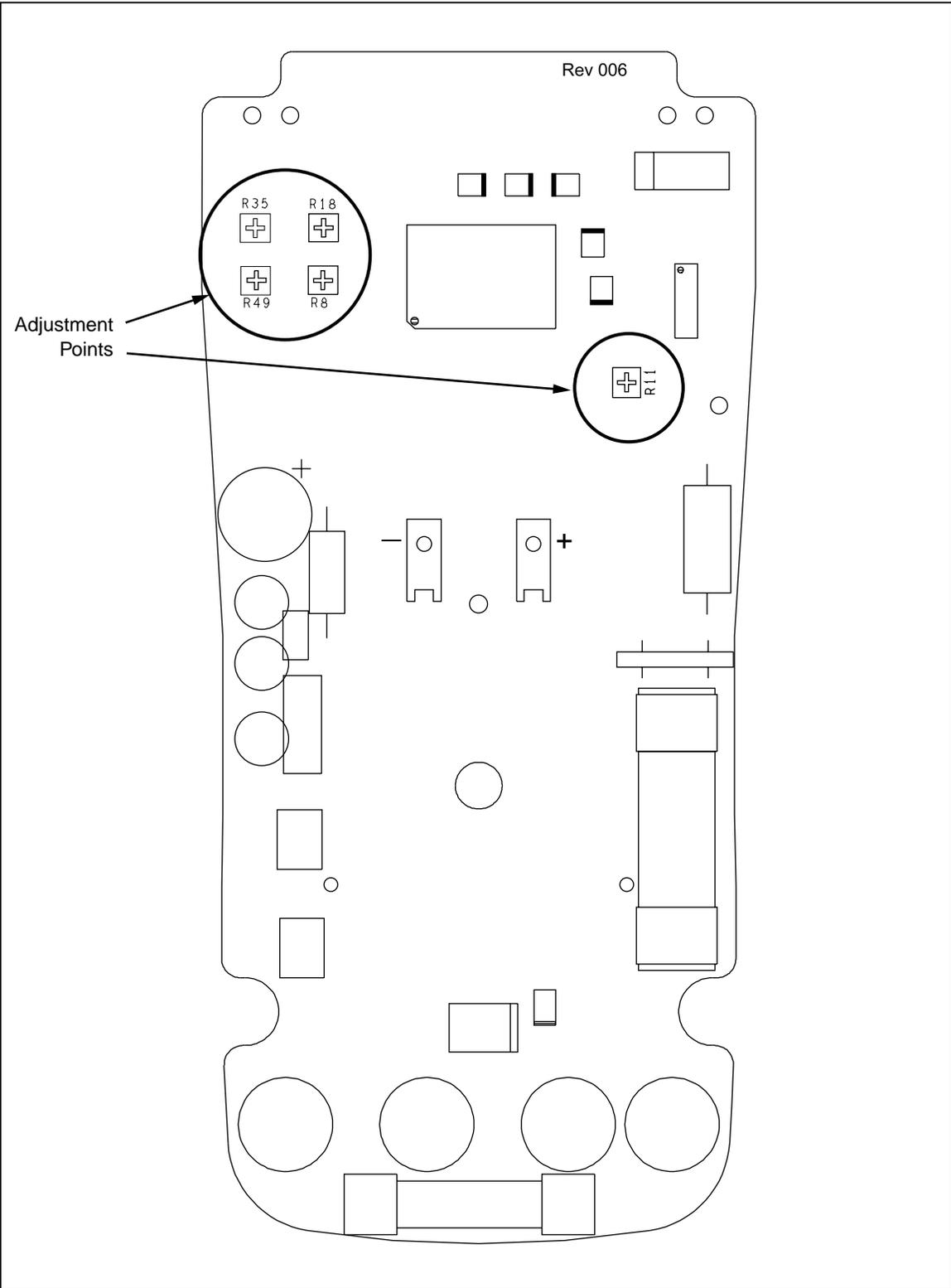
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### 17B Adjustment

Refer to Table 6 for the 17B adjustment procedure, Figure 4 for the adjustment points, and Figure 5 for temperature adjustment connections.

Table 6. 17B Adjustment

Step	Test Function	Switch	Button	Potentiometer	5520	UUT Test Specifications
1	mV dc Adjustment	$\overline{\text{mV}}$	NO	R18	350 mV dc	349.9 to 350.1 mV dc
For step 2, if the display reads between 34.91 and 35.09 V dc, no adjustment is necessary.						
2	Volts dc Adjustment	$\overline{\text{V}}$	NO	R18	35 V dc	If the display reads less than 34.91, adjust R18 to 34.91 to 34.92 V dc. If the display reads more than 35.09 Adjust R18 to 35.08 to 35.09 V dc.
3	Volts AC Adjustment	$\tilde{\text{V}}$	NO	R8	35 V 50 Hz	If step 2 V dc calibration is less than 35 V dc, adjust R8 to 34.91 to 34.92 V ac. If step 2 V dc Cal is equal to or greater than 35 V dc, adjust R8 to 34.99 to 35.01 V ac.
Set Calibrator to STANDBY.						
4	Capacitance Adjustment	$\text{F}$	NO	R11	350 nF	349.0 to 351.0 nF
Set Calibrator to STANDBY. For Step 5, place the Surface Thermocouple Probe directly onto the UUT <b>COM</b> jack screw and note the UUT display reading in °C.						
5	Temperature Offset Adjustment	°C	NO	R49	0 V OPR	Match Fluke 51 Reading
Note: In step 6, wait until the reading has settled before pushing <input type="button" value="REL"/> . Failure to do so can result in a reading that is outside the adjustment range limits.						
6	Temperature Gain Adjustment	°C	<input type="button" value="REL"/>	-	NO	$\Delta$ icon ON -0.2 to 0.2 °C
7		°C	-	R35	2.436 mV dc	$\Delta$ icon ON 59.9 to 60.1 °C
RESET Calibrator						
8	OFF	OFF				



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Figure 4. 17B Adjustment Points

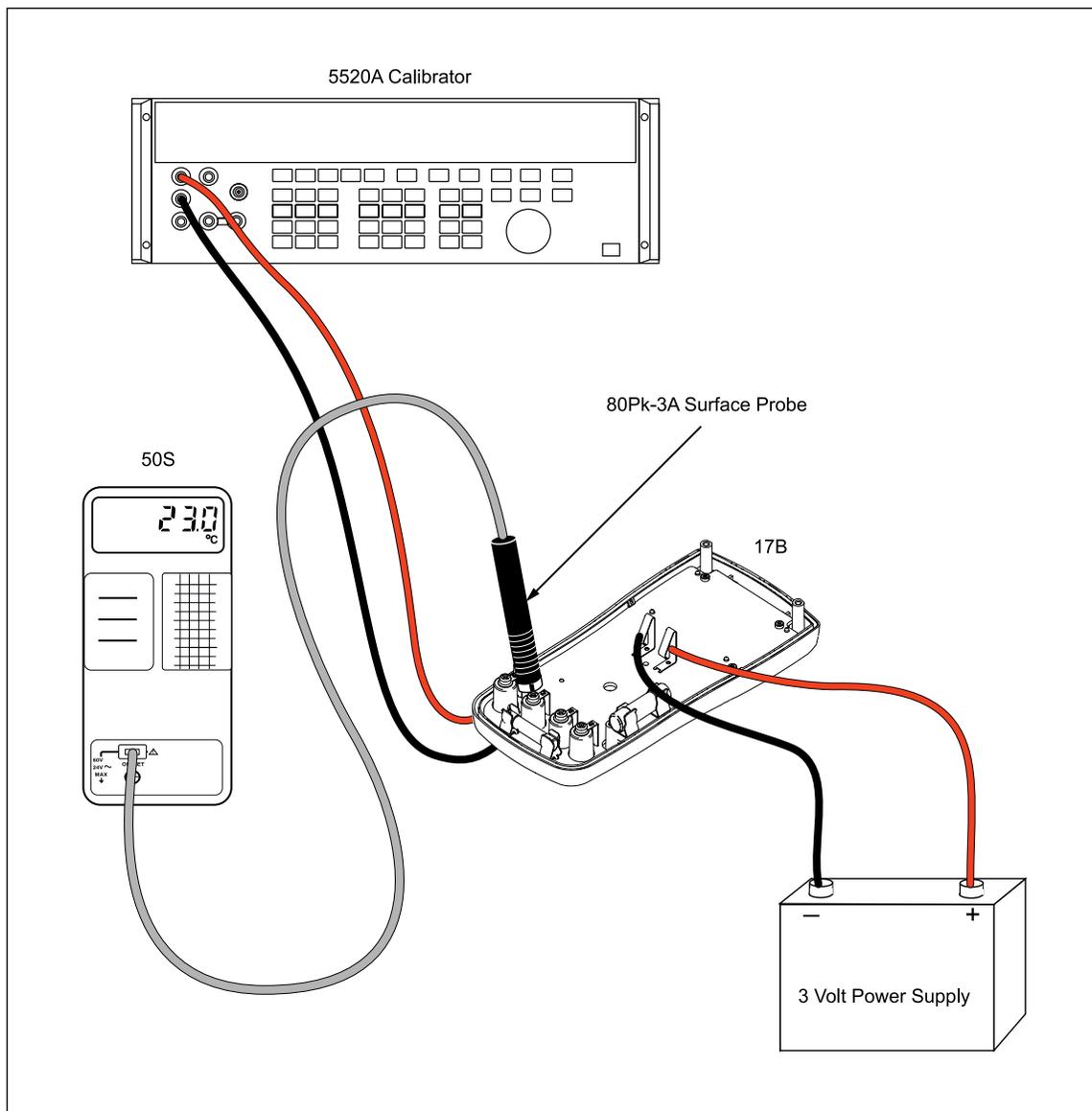


Figure 5. Temperature Adjustment Connections

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## Maintenance

### ⚠⚠ Warning

Beyond replacing batteries and fuses, do not attempt to repair or service your Meter unless you are qualified to do so and have the relevant calibration, performance test, and service instructions.

### General Maintenance

Periodically wipe the case with a damp cloth and mild detergent.

#### Caution

- Do not use abrasives or solvents.
- Dirt or moisture in the terminals can affect readings.

To clean the terminals

1. Turn the Meter **OFF** and remove the test leads.
2. Shake out any dirt that may be in the terminals.
3. Soak a new swab with alcohol.
4. Work the swab around in each terminal.

### Testing the Fuses

#### Warning

To avoid electric shock or injury, remove the test leads and any input signals before replacing the fuses.

1. Turn the rotary switch to .
2. Plug a test lead into the  terminal and touch the probe to the **A** or **mA**  $\mu$ **A** terminal.

A good **A** terminal fuse is indicated when the Meter shows a reading between 000.0  $\Omega$  and 000.1  $\Omega$ . A good **mA**  $\mu$ **A** terminal fuse is indicated by a reading between 0.990 k $\Omega$  and 1.010 k $\Omega$ .

3. If the display reads , replace the fuse and test again.
4. If the display shows any other value, have the Meter serviced. Refer to “Contacting Fluke”.

### Replacing the Batteries and Fuses

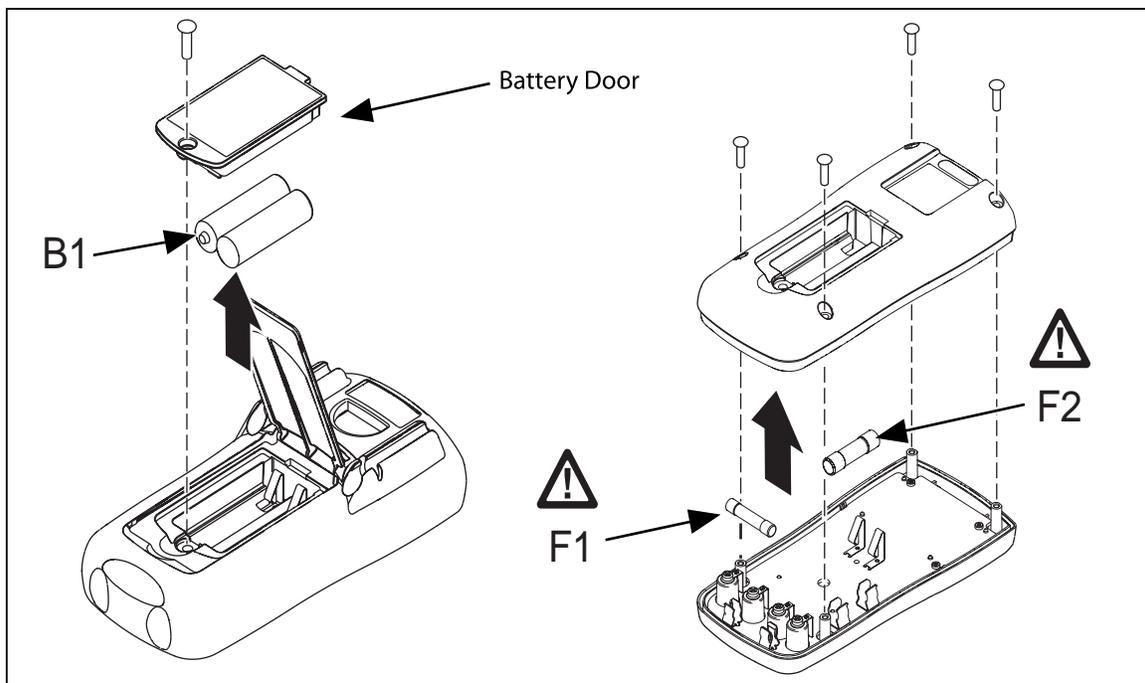
#### Warning

To avoid false readings, which could lead to possible electric shock or personal injury, replace the batteries as soon as the battery indicator () appears.

To prevent damage or injury, install **ONLY** replacement fuses with the specified amperage, voltage, and interrupt ratings.

Disconnect test leads before opening the case or the battery door.

To replace the Batteries or Fuses, refer to Figure 6:



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Figure 6. Replacing the Batteries and Fuses

## Customer Replaceable Parts

Customer replaceable parts are listed in Table 7.

Table 7. Replacement Parts

Part Description	Part Number
⚠ F1 Fuse, 500 mA, 1000 V Min. Interrupt Rating 20,000 A	1989732
⚠ F2 Fuse, 10 A, 1000 V Min. Interrupt Rating 20,000 A	1989726
B1 Battery, 2 X AA Alkaline NEDA 15A, IEC LR6	376756
Battery Door	1884065
TL71 Precision Probe Assembly (not shown)	1274382
15B & 17B Users Manual (not shown)	1991246