

**FLUKE®**

**Fluke Digital  
Multimeters**

**Solutions  
for every need**



**SALISBURY**  
**WEAR**

# How to choose the best DMM for your job

Choosing the right digital multimeter (DMM) requires thinking about what you'll be using it for. Evaluate your basic measurement needs and job requirements and then take a look at special features/functions built into many multimeters. Think about whether you need to do basic measurements, or if you need the more advanced troubleshooting options offered by special features.

## Factors to consider:

- Your work environment (voltage level, types of equipment, types of measurements, applications)
- Specialty features/functions (capacitance, frequency, temperature, non-contact voltage, low impedance mode, min/max record, data logging, trending)
- Resolution and accuracy (6,000, 20,000, or 50,000 count resolution)

## Safety

The increased occurrence and levels of transient overvoltages in today's power systems have given rise to more stringent safety standards for electrical measurement equipment. Transients that ride on top of power sources (mains, feeder or branch circuits) can trigger a sequence of events that may lead to serious injury. Test equipment must be designed to protect people working in this high-voltage, high-current environment.

## Measurement categories at a glance

	In brief	Examples
<b>CAT IV</b>	Three-phase at utility connection, any outdoor mains conductors	<ul style="list-style-type: none"> <li>• Refers to the "origin of installation," i.e., where low-voltage connection is made to utility power</li> <li>• Electricity meters, primary overcurrent protection equipment</li> <li>• Outside and service entrances, service drop from pole to building, run between meter and panel</li> <li>• Overhead line to detached building, underground line to well pump</li> </ul>
<b>CAT III</b>	Three-phase distribution, including single-phase commercial lighting	<ul style="list-style-type: none"> <li>• Equipment in fixed installations, such as switchgear and polyphase motors</li> <li>• Bus and feeders in industrial plants</li> <li>• Feeders and short branch circuits, distribution panel devices</li> <li>• Lighting systems in larger buildings</li> <li>• Appliance outlets with short connections to service entrance</li> </ul>
<b>CAT II</b>	Single-phase receptacle connected loads	<ul style="list-style-type: none"> <li>• Appliance, portable tools, and other household and similar loads</li> <li>• Outlet and long branch circuits                             <ul style="list-style-type: none"> <li>– Outlets at more than 10 meters (30 feet) from CAT III source</li> <li>– Outlets at more than 20 meters (60 feet) from CAT IV source</li> </ul> </li> </ul>



## Wirelessly relay data with Fluke Connect® Meters

Meters can be used as a stand-alone tool or as part of the Fluke Connect system

The largest system of software and wireless test tools in the world.



### ir3000 FC Connector

Adds the power of the Fluke Connect® mobile app to your measurements.

- Fits over the IR port of your existing Fluke tools (289, 287 or 789)
- Enables you to graph, save, and share readings with your team from your smart phone



### a3000 FC Wireless AC Current Clamp Meter

- Measure up to 400 A ac true-rms
- Inrush function
- Logging function for recording and saving up to 65,000 readings



### a3001 FC Wireless iFlex AC Current Clamp Meter

- Measure up to 2500 A ac with a true-rms flexible current meter
- Record over time (up to 65,000 readings) to monitor circuit load changes for an hour, a shift or a week
- Inrush function



### a3003 FC Wireless DC 2000 A Current Meter

- Measure up to 2000 A dc
- Large jaw size (64 mm) for measuring large or parallel current conductors
- Logging function for recording and saving up to 65,000 readings

## Fluke 279 FC Thermal Multimeter



### Find. Repair. Validate. Report.

The 279 FC is a full-featured digital multimeter with integrated thermal imaging and is designed to increase your productivity and confidence. The thermal multimeter helps you find, repair, validate, and report many electrical issues quickly so that you are confident problems are solved.

### Locate the problem immediately

Thermal imaging multimeters are a first-line troubleshooting tool for electrical equipment that can check hot spots on high-voltage equipment and transformers, detect heating of fuses, wires, insulators, connectors, splices and switches. Scanning with the 279 FC's thermal imager reveals many electrical issues rapidly and from a safe distance. By combining two tools into one, the thermal multimeter lightens the load and increases productivity.

### Expanded functionality

Compatible with iFlex® (a flexible current clamp) to expand your measurement capabilities and get into tight, hard to reach spaces for current measurement (up to 2500 A ac). The large full-color LCD screen makes for easier and clearer viewing of images and readings. The 10 hour+ rechargeable battery keeps you going all day long under normal conditions.

### Communicate your results

With built-in Fluke Connect®, transmit results wirelessly to a smartphone and save time on reporting to validate work is complete. Troubleshoot better by instantly trending and monitoring measurements live on your smartphone screen. Create and email reports right from the field.



**FLUKE CONNECT®**



#### a3004 FC Wireless DC 4-20 mA Current Meter

- Measure 4 to 20 mA dc signals without breaking the loop
- Logging function for recording and saving up to 65,000 readings



#### v3000 FC Wireless AC Voltage Meter

- Measure up to 1000 V true-rms ac
- Logging function for recording and saving up to 65,000 readings



#### v3001 FC Wireless DC Voltage Meter

- Measure up to 1000 V dc
- Logging function for recording and saving up to 65,000 readings



#### t3000 FC Wireless Temperature Meter

- Measure -200 °C to 1372 °C with k-type thermocouple
- Logging function for recording and saving up to 65,000 readings

# Meters designed for the way you work

## ADVANCED METERS

## GENERAL PURPOSE



	289/287	87V	3000 FC	233	179	77 IV
<b>Basic features</b>						
Counts	50000	20000	6000	6000	6000	6000
True-rms readings	ac+dc	ac	ac	ac	ac	
Basic dc accuracy	0.025 %	0.05 %	0.09 %	0.25 %	0.09 %	0.3 %
Wide bandwidth	100 kHz	20 kHz				
Auto / manual ranging	• / •	• / •	• / •	• / •	• / •	• / •
Digits	4-1/2	4-1/2	3-1/2	3-1/2	3-1/2	3-1/2
ATEX II 2G Eex ia IIC T4 safety rating Zone 1 and Zone 2						
<b>Measurements</b>						
Voltage ac/dc	1000 V	1000V	1000 V	1000 V	1000 V	1000 V
Current ac/dc	10 A	10 A	400 mA	10 A	10 A	10 A
Resistance	500 MΩ	50 MΩ	50 MΩ	40 MΩ	50 MΩ	50 MΩ
Frequency	1 MHz	200 kHz	100 kHz	50 kHz	100 kHz	100 kHz
Capacitance	100,000 μF	10,000 μF	10,000 μF	10,000 μF	10,000 μF	10,000 μF
Temperature	(+) 1350 °C	(+) 1090 °C		(+) 400 °C	(+) 400 °C	
Conductance / dB	50 nS / 60 dB	50 nS / -				
Duty cycle / pulse width	• / •	• / -				
Continuity / diode test	•		•	•	•	•
Motor Drive (ASD) Measurements	• (289)	•				
VoltAlert™, non-contact voltage detection						
VCHEK™						
LoZ: low input impedance	• (289)					
Lo ohms	• (289)					
Microamps	•	•				
<b>Display</b>						
Fluke Connect™-enabled	•*		•			
Dot matrix display	•		•			
Dual display	•		•			
Analog bargraph	•	•			•	•
Backlight	Two level	Two level	•	•	•	•
Graphical trend display	•					
<b>Diagnostics and data</b>						
Min/Max recording / with time stamp	• / •	• / -	• / -	• / -	• / -	• / -
Fast min/max	250 μs	250 μs				
Display Hold/Auto (Touch) Hold	• / •	• / •	• / •	• / •	• / •	• / •
Relative reference	•	•				
Stand alone logging	•					
Trend capture	•					
Readings memories	10,000		(With FC app)			
USB interface	•					
<b>Other features</b>						
Automatic selection, ac/dc volts						
Overmolded case, integrated holster	•		•	•	•	•
Removable holster		•				
Infrared camera resolution						
Infrared camera Range						
iFlex compatibility			(With separate modules)			
Insulation test voltages						
Pi/DAR timed ratio test						
Completely sealed and watertight						
Operating temperature range	-20 °C, +55 °C	-20 °C, +55 °C	-10 °C, +50 °C	-10 °C, +50 °C	-10 °C, +50 °C	-10 °C, +50 °C
<b>Warranty and electrical safety</b>						
Warranty (years)	Lifetime	Lifetime	3	3	Lifetime	Lifetime
Input alert	•	•				
Dangerous voltage indication	•		•	•	•	•
IP rating		IP 30	IP 54			
EN61010-1 CAT III	1000 V	1000 V	1000 V	1000 V	1000 V	1000 V
EN61010-1 CAT IV	600 V	600 V	600 V	600 V	600 V	600 V

\* ir3000 FC Adapter required—sold separately

COMPACT METERS

SPECIALTY METERS



	117/115	116	114/113	279 FC	1587 FC	28 II / 28 II Ex	27 II
<b>Basic features</b>							
Counts	6000	6000	6000	6000	6000	20000	6000
True-rms readings	ac	ac	ac	ac	ac	ac	
Basic dc accuracy	0.5 %	0.5 %	0.5 %	0.09 %	0.09 %	0.05 %	0.1 %
Wide bandwidth					5 kHz	20 kHz	30 kHz
Auto / manual ranging	• / •	• / •	• / •	• / •	• / •	• / •	• / •
Digits	3-1/2	3-1/2	3-1/2	3-1/2	4-1/2	3-1/2 / 4-1/2	3-1/2
ATEX II 2G Eex ia IICT4 safety rating Zone 1 and Zone 2						28 II Ex	
<b>Measurements</b>							
Voltage ac/dc	600 V	600 V	600 V	1000 V	1000V	1000 V	1000 V
Current ac/dc	10 A	600 µA		2500 A ac (with iFlex)	400 mA	10 A	10 A
Resistance	40 MΩ	40 MΩ	40 MΩ	50 MΩ	50 MΩ	50 MΩ	50 MΩ
Frequency	100 kHz	100 kHz		100 kHz	100 kHz	200 kHz	200 kHz
Capacitance	10,000 µF	10,000 µF		10,000 µF	10,000 µF	10,000 µF	10,000 µF
Temperature		(+) 400 °C		Infrared Camera -10 °C to 200 °C	(+) 537 °C	(+) 1090 °C	
Conductance / dB						60 nS / -	60 nS / -
Duty cycle / pulse width						• / -	• / -
Continuity / diode test	•	•	•	•	•	•	•
Motor Drive (ASD) Measurements				•	•	•	•
VoltAlert™, Non-contact voltage detection	• (117)						
VCHEK™			• (113)				
LoZ: low input impedance	• (117)	•	•				
Lo ohms							
Microamps		•			•	•	•
<b>Display</b>							
Fluke Connect®-enabled				•			
Dot matrix display				•			
Dual display				•			
Analog bargraph	•	•	•			•	•
Backlight	•	•	•	•	•	Two level	Two level
Graphical trend display							
<b>Diagnostics and data</b>							
Min/Max recording / with time stamp	• / -	• / -	• / -	• / -	• / -	• / -	• / -
Fast min/max						250 µs	
Display Hold/Auto (Touch) Hold	• / -	• / -	• / -	• / •	• / •	• / •	• / •
Relative reference						•	•
Stand alone logging							
Trend capture							
Readings memories				(With FC app)	(With FC app)		
USB interface				•			
<b>Other features</b>							
Automatic selection, ac/dc volts	• (117)	•	•				
Overmolded case, integrated holster							
Removable holster	•	•	•	•	•	•	•
Infrared camera resolution				80 x 60			
Infrared camera Range				-10 °C, +200 °C			
iFlex compatibility				•			
Insulation test voltages					50 V, 100 V, 250 V, 500 V, 1000 V		
Pi/DAR timed ratio test					•		
Completely sealed and watertight						•	•
Operating temperature range	-10 °C, +50 °C	-10 °C, +50 °C	-10 °C, +50 °C	-10 °C, +50 °C	-20 °C, +55 °C	-40 °C, +55 °C / -15 °C, +50 °C	-40 °C, +55 °C
<b>Warranty and electrical safety</b>							
Warranty (years)	3	3	3	3	3	Lifetime / 3	Lifetime
Input alert						•	•
Dangerous voltage indication	•	•	•	•	•	•	•
IP rating	IP 42	IP 42	IP 42	IP 40	IP 40	IP 67	IP 67
EN61010-1 CAT III	600 V	600 V	600 V	1000 V	1000 V	1000 V	1000 V
EN61010-1 CAT IV			600 V (113)	600 V	600 V	600 V	600 V

# Digital Multimeter selection chart



**Fluke 289**



**Fluke 287**



**Fluke 87V**

## Advanced meters

### Best for

Advanced industrial troubleshooting, including data logging and graphing intermittent problems.

### Logging

For unattended monitoring of signals over time, to detect intermittent problems.

### Graphing

View logged values graphically in the field right on the meter, without a PC.

### Working on VSDs

Take accurate voltage, current and frequency measurements on the output side of the drive at either the drive itself or the motor terminals.

### Testing motor windings or contact resistance

Allows testing of resistance up to 50 ohms with one milliohm (0.001 ohm) resolution.

### Best for

Advanced electronic applications, including data logging and graphing intermittent problems.

### Logging

For unattended monitoring of signals over time, and characterize device performance.

### Graphing

View logged values graphically in the field right on the meter, without a PC.

### Monitoring two parameters at the same time

Dual display allows for monitoring of two selectable parameters.

### Performance testing

Testing the frequency response of amplifiers and audio transmission line.

### Best for

Industrial troubleshooting.

### Working on VSDs

Take accurate voltage, current and frequency measurements on the output side of the drive at either the drive itself or at the motor terminals.

### Industrial troubleshooting

All of the resolution and accuracy you need to solve more problems on motor drives, in-plant automation, power distribution, and electromechanical equipment.

### Checking power quality

Capture glitches and spikes as short as 250  $\mu$ s. Identify irregular signals.



**Fluke 3000 FC**



**Fluke 233**



**Fluke 179**

## General purpose meters

### Best for

Fluke FC wireless test tools work together to help you troubleshoot faster.

### Work faster, safer and easier with FC wireless test tools

The 3000 FC Multimeter displays the meter measurement, plus readings from up to three wireless modules, connect to your smart phone to see reading directly on your phone.

### Build the system as your needs grow

Start with the multimeter and future proof your investment.

### Best for

Remote display digital multimeter.

### Take measurements in hard to reach places.

With its removable display, you have the flexibility to take measurements in hard to reach places or in areas with restricted access. You can be in two places at once and reduce the risk of arc flash by separating yourself from hazardous measurement situations.

### Work more productively

Now one person can complete a test that would have required two people using ordinary test tools.

### Best for

Every day use requiring true-rms, accurate, rugged meter.

### Industrial troubleshooting

Applications requiring exceptional ease-of-use, ruggedness and reliability.

### Electrical maintenance and troubleshooting

Variety of commercial electrical troubleshooting, installation and maintenance.

### Temperature measurements

Built-in thermometer conveniently allows you to take temperature readings without having to carry a separate instrument.

# Digital Multimeter selection chart



**Fluke 117**



**Fluke 116**



**Fluke 115**



**Fluke 113**

## Compact meters

**Best for**  
Wide variety of electrical work.

**Electrical maintenance troubleshooting**

When you need to eliminate false or “ghost” voltages or perform continuity, connection or basic wiring checks.

**Non-contact voltage detection**

Integrated non-contact voltage detection simplifies many tasks.

**Best for**  
HVAC troubleshooting.

**Residential HVAC maintenance**

Lower voltage HVAC residential maintenance, installation and troubleshooting.

**Temperature and microamp measurements**

Troubleshooting problems with HVAC equipment and flame sensors.

**Best for**  
Electronic and field service applications.

**Electronic troubleshooting**

Troubleshoot a wide variety of measurement parameters, including frequency and capacitance.

**Best for**  
Utility applications involving basic electrical tests.

**Revenue meter tests:**

Involving meter sets and reconnects, capacitor checks, detection of absence or presence of voltage, and for continuity, connections or basic wiring checks.

**Simultaneous voltage and continuity checks**

Check LoZ low impedance function allows users to check voltage and continuity simultaneously.





**Fluke 279 FC**



**Fluke 1587 FC**



**Fluke 28 II/27 II**



**Fluke 28 II Ex**

## Specialty meters

**Best for**  
First-line troubleshooting.

**Helping you find, repair, validate and report** on electrical issues quickly, gives you the confidence that the problem has been solved.

**Locate the problem immediately**  
Checking for hotspots on high voltage equipment and transforming and motors.

**Increased productivity**  
Use the thermal imager to scan for problems and then use the digital multimeter further troubleshoot.

**Preventive maintenance simplified, rework eliminated**  
Save time and improve the reliability of your maintenance data by wirelessly syncing measurements directly to an asset record or work order using the Fluke Connect® system.

**Best for**  
Troubleshooting and preventative maintenance around motors, generators, and switch gear.

**Insulations tests:**  
The insulation of electrical power systems can be tested for system performance, system safety, system reliability and as part of asset management.

**Moisture tests:**  
Carrying out PI/DAR timed ratio tests with TrendIt™ graphs to identifies moisture and contaminated insulation problems.

**Working on VSDs**  
Take accurate voltage, current and frequency measurements on the output side of the drive at either the drive itself or the motor terminals.

**Best for**  
Harsh environments requiring dustproof and waterproof test equipment.

**Industrial troubleshooting for indoor and outdoor harsh environments**  
Dustproof, waterproof, shockproof multimeter designed to withstand the toughest environments.

**Working on variable speed drives (VSDs)**  
Take accurate voltage, current and frequency measurements on the output side of the drive at either the drive itself or at the motor terminals. (28 II only)

**Best for**  
Industrial troubleshooting in explosive environments.

**Safety and compliance**  
The Fluke 28 II Ex is an intrinsically safe digital multimeter designed for use in dangerous or explosive atmospheres.

**Agency approvals**  
IECEx Ex ia IIC T4 Gb, Ex ia IIIC T130 °C Db, I M1 Ex ia I Ma.

**Industrial troubleshooting**  
Completely sealed, IP67 rated case; Withstands drops up to 10 feet or 3 meters (with holster); dustproof per IEC60529 IP6x; waterproof per IEC60529 IPx7; meets IEC Overvoltage Electrical Safety Standard No. 61010-1:2001.

# Fluke 77IV Digital Multimeter

## Technical Data

### Versatile meters for field service or bench repair

The NEW Fluke 77-IV digital multimeter has the features needed to repair most electrical and electronic problems. This meter is simple to use and has significant improvements over Fluke's original 70 Series with more measurement functions, conformance to the latest safety standards, and a much larger display that's easier to view.

#### It measures:

- Wide 1000 V measurement range
- Average responding ac measurements
- 0.3 % accuracy
- 20 A for 30 seconds
- Frequency and capacitance
- Resistance and continuity

#### General specifications

Accuracy is specified for 1 year after calibration, at operating temperatures of 18 °C to 28 °C, with relative humidity at 0 % to 90 %. Accuracy specifications take the form of  $\pm$ [ % of Reading ] + [ Counts ].

Maximum voltage between any terminal and earth ground	1000 V
Surge protection	8 kV peak per IEC 61010
$\Omega$ Fuse for mA input	440 mA, 1000 V FAST Fuse
$\Omega$ Fuse for A input	11 A, 1000 V FAST Fuse
Display	Digital: 6,000 counts, updates 4/sec
Bar graph	33 segments, updates 32/sec
Frequency	10,000 counts
Capacitance	1,000 counts
Operating altitude	2,000 meters
Storage altitude	12,000 meters
Operating temperature	-10 °C to + 50 °C
Storage temperature	-40 °C to + 60 °C
Temperature coefficient	0.1 X (specified accuracy/°C (< 18 °C or > 28 °C))
Electromagnetic compatibility (EN 61326-1:1997)	In an RF field of 3 V/M, accuracy = specified accuracy except in temperature: specified accuracy $\pm$ 5 °C (9 °F)
Relative humidity (maximum non-condensing)	90 % to 35 °C; 75 % to 40 °C; 45 % to 50 °C
Battery life	400 hours typical (Alkaline)
Size (H x W x L)	4.3 cm x 9 cm x 18.5 cm
Weight	420 g
Safety compliance	ANSI/ISA S82.02.01, CSA C22.2-1010.1, IEC 61010 to 1000 V Measurement Category III, 600 V Measurement Category IV
Certifications	CSA, TÜV (EN61010), UL, II, (N10140), VDE



Function	Range	Resolution	Accuracy ± ([% of reading] + [counts])
AC volts (average responding)	6.000 V	0.001 V	2.0 % + 2 (45 Hz to 1 kHz)
	60.00 V	0.01 V	
	600.0 V	0.1 V	
	1000 V	1 V	
DC mV	600.0 mV	0.1 mV	0.3 % + 1
DC volts	6.000 V	0.001 V	0.3 % + 1
	60.00 V	0.01 V	
	600.0 V	0.1 V	
	1000 V	1 V	
Continuity	600 Ω	1 Ω	Meter beeps at < 25 Ω, beeper turns off at > 250 Ω; detects opens or shorts of 250 μs or longer.
Ohms	600.0 Ω	0.1 Ω	0.5 % + 2
	6.000 kΩ	0.001 kΩ	0.5 % + 1
	60.00 kΩ	0.01 kΩ	
	600.0 kΩ	0.1 kΩ	
	6.000 MΩ	0.001 MΩ	
	50.00 MΩ	0.01 MΩ	2.0 % + 2
Diode test	2.400 V	0.001 V	1 % + 2
Capacitance	1000 nF	1 nF	1.2 % + 2
	10.00 μF	0.01 μF	
	100.0 μF	0.1 μF	
	9999 μF <sup>1</sup>	1 μF	10 % typical
AC amps (average responding)	60.00 mA	0.01 mA	2.5 % + 2 (45 Hz to 1 kHz)
	400.0 mA <sup>3</sup>	0.1 mA	
	6.000 A	0.001 A	
	10.00 A <sup>4</sup>	0.01 A	
DC amps <sup>3</sup>	60.00 mA	0.01 mA	1.5 % + 2
	400.0 mA <sup>4</sup>	0.1 mA	
	6.000 A	0.001 A	
	10.00 A <sup>5</sup>	0.01 A	
Hz <sup>2,5</sup> (ac voltage input)	99.99 Hz	0.01 Hz	0.1 % + 1
	999.9 Hz	0.1 Hz	
	9.999 kHz	0.001 kHz	
	99.99 kHz	0.01 kHz	
MIN MAX AVG	For dc functions, accuracy is the specified accuracy of the measurement function (12 counts for changes longer than 275 ms in duration). For ac functions, accuracy is the specified accuracy of the measurement function (40 counts for changes longer than 1.2 s in duration).		

- 1 In the 9999 (F range for measurements to 1000 (F, the measurement accuracy is 1.2 % + 2.
- 2 Amps input burden voltage (typical): 400 mA input 2 mV/mA, 10 A input 37 mV/A.
- 3 400.0 mA accuracy specified up to 600 mA overload.
- 4 >10 A unspecified.
- 5 Frequency is specified from 2 Hz to 99.99 kHz. Below 2 Hz, the display shows zero Hz.

## Ordering information

**Fluke-77-4** Digital Multimeter  
**Included**  
 TL75 Test leads, user's manual and 9 V battery (installed).



**Fluke.** Keeping your world up and running.™

# Model 77 Series IV

## Digital Multimeter

### *Calibration Information*

#### **Introduction**

#### **⚠⚠ Warning**

**To prevent possible electrical shock, fire, or personal injury, do not do the performance tests or calibration adjustment procedures unless qualified.**

**The information provided in this document is for the use of qualified personnel only.**

This document provides the information necessary to adjust and verify the performance of the Fluke Model 77 Series IV Digital Multimeter (hereafter known as the Meter or Product).

The following information is included in this document:

- Safety Information (page 2)
- International Electrical Symbols (page 3)
- Test Lead Alert (page 3)
- Specifications (page 4)
- Testing and Replacing the Fuses (pages 7 and 8)
- Replacing the Battery (page 8)
- Cleaning (page 9)
- Replacing the LCD (page 9)
- Performance Tests (page 10)
- Calibration Adjustment (page 14)
- Replaceable Parts and Accessories (page 17)
- Complete Warranty (page 19)

See the *Model 77 Series IV Users Manual* for complete operating instructions.

## **Safety Information**

### **Warning and Caution Statements**

A **⚠⚠ Warning** identifies hazardous conditions and actions that could cause bodily harm or death.

A **⚠ Caution** identifies conditions and actions that could damage the Meter, the equipment under test, or cause permanent loss of data.
















#### **⚠⚠ Warnings**

To prevent possible electrical shock, fire, or personal injury, or damage to the Product or equipment under test:

- Use the Product only as specified, or the protection supplied by the Product can be compromised.
- Do not use test leads if they are damaged. Examine the test leads for damaged insulation, exposed metal, or if the wear indicator shows. Check test lead continuity.
- Use the correct terminals, function, and range for measurements.
- Do not use test leads if they are damaged. Examine the test leads for damaged insulation and measure a known voltage.
- Do not apply more than the rated voltage, between the terminals or between each terminal and earth ground.
- Do not touch voltages > 30 V ac rms, 42 V ac peak, or 60 V dc.
- Disconnect power and discharge all high-voltage capacitors before you measure resistance, continuity, capacitance, or a diode junction.
- Do not use the Product around explosive gas or vapor.
- Keep fingers behind the finger guards on the probes.
- Remove all probes, test leads, and accessories before the battery door is opened.

## International Electrical Symbols

The following international symbols appear in this document, or on the Meter.

Symbols	Description	Symbols	Description
	AC (Alternating Current)		Fuse
	DC (Direct Current)		Conforms to European Union directives
	DC/AC		Certified by CSA Group to North American safety standards.
	Earth		Double-insulated
	WARNING. RISK OF DANGER.		WARNING. HAZARDOUS VOLTAGE. Risk of electric shock.
	Battery. (Low battery when shown on display)		Consult user documentation.
	Certified by TÜV SÜD Product Service.		Conforms to relevant South Korean EMC Standards.
	Conforms to relevant Australian safety and EMC standards		
<b>CAT II</b>	Measurement Category II is applicable to test and measuring circuits connected directly to utilization points (socket outlets and similar points) of the low-voltage MAINS installation.		
<b>CAT III</b>	Measurement Category III is applicable to test and measuring circuits connected to the distribution part of the building's low-voltage MAINS installation.		
<b>CAT IV</b>	Measurement Category IV is applicable to test and measuring circuits connected at the source of the building's low-voltage MAINS installation.		

## Test Lead Alert

### Warning

**To prevent possible injury or damage to the Product, make sure the test leads are in the correct terminals. If an incorrect terminal is used, the Product fuse could be blown or the Product could be damaged.**

As a reminder to check that the test leads are in the correct terminals, **LEAD** is momentarily displayed when the Rotary Switch is moved to or from the **mA** or **A** position.

## Specifications

Accuracy is specified for 1 year after calibration, at operating temperatures of 18 °C to 28 °C, with relative humidity at 0 % to 90 %. Accuracy specifications take the form of  $\pm([\% \text{ of Reading}] + [\text{Counts}])$ .

### Maximum voltage between any

terminal and earth ground ..... 1000 V

⚠ Fuse for mA inputs ..... 0.44 A, 1000 V, IR 10 kA

⚠ Fuse for A inputs ..... 11 A, 1000 V, IR 17 kA FAST Fuse

### Display

Digital ..... 6000 counts, updates 4/sec

Bar Graph ..... 33 segments; Updates 32/sec

Frequency ..... 10,000 counts

Capacitance ..... 1,000 counts

### Altitude

Operating ..... 2,000 meters

Storage ..... 12,000 meters

### Temperature

Operating ..... -10 °C to +50 °C

Storage ..... -40 °C to +60 °C

Temperature coefficient ..... 0.1 X (specified accuracy / °C (<18 °C or >28 °C))

### Safety

General ..... IEC 61010-1: Pollution Degree 2

Measurement ..... IEC 61010-2-033: CAT IV 600 V / CAT III 1000 V

Relative Humidity (Maximum Non-condensing): 90 % to 35 °C  
75 % to 40 °C;  
45 % to 50 °C

Battery Life ..... 400 hrs typical (Alkaline)

Size (H x W x L) ..... 4.3 cm x 9 cm x 18.5 cm

Weight ..... 420 g

### Electromagnetic Compatibility (EMC)

International ..... IEC 61326-1: Portable Electromagnetic Environment, IEC 61326-2-2.

CISPR 11: Group 1, Class A

*Group 1: Equipment has intentionally generated and/or uses conductively-coupled radio frequency energy that is necessary for the internal function of the equipment itself.*

*Class A: Equipment is suitable for use in all establishments other than domestic and those directly connected to a low-voltage power supply network that supplies buildings used for domestic purposes. There may be potential difficulties in ensuring electromagnetic compatibility in other environments due to conducted and radiated disturbances.*

*Emissions that exceed the levels required by CISPR 11 can occur when the equipment is connected to a test object.*

Korea (KCC) ..... Class A Equipment (Industrial Broadcasting & Communication Equipment)

*Class A: Equipment meets requirements for industrial electromagnetic wave equipment and the seller or user should take notice of it. This equipment is intended for use in business environments and not to be used in homes.*

USA (FCC) ..... 47 CFR 15 subpart B. This product is considered an exempt device per clause 15.103.

**Digital Multimeter  
Specifications**

Function	Range	Resolution	Accuracy ± ( [ % of Reading ] + [ Counts ] )
AC Volts (Average responding)	6.000 V 60.00 V 600.0 V 1000 V	0.001 V 0.01 V 0.1 V 1 V	2.0 % + 2 (45 Hz to 1 kHz)
DC mV	600.0 mV	0.1 mV	0.3 % + 1
DC Volts	6.000 V 60.00 V 600.0 V 1000 V	0.001 V 0.01 V 0.1 V 1 V	0.3 % + 1
Continuity	600 Ω	1 Ω	Meter beeps at <25 Ω, beeper turns off at >250 Ω; detects opens or shorts of 250 μs or longer.
Ohms	600.0 Ω 6.000 kΩ 60.00 kΩ 600.0 kΩ 6.000 MΩ 50.00 MΩ	0.1 Ω 0.001 kΩ 0.01 kΩ 0.1 kΩ 0.001 MΩ 0.01 MΩ	0.5 % + 2 0.5 % + 1 0.5 % + 1 0.5 % + 1 0.5 % + 1 2.0 % + 1
Diode test	2.400 V	0.001 V	1 % + 2
Capacitance	1000 nF 10.00 μF 100.0 μF 9999 μF <sup>[1]</sup>	1 nF 0.01 μF 0.1 μF 1 μF	1.2 % + 2 1.2 % + 2 1.2 % + 2 10 % typical
AC Amps (Average responding) <sup>[2]</sup>	60.00 mA 400.0 mA <sup>[3]</sup> 6.000 A 10.00 A <sup>[4]</sup>	0.01 mA 0.1 mA 0.001 A 0.01 A	2.5 % + 2 (45 Hz to 1 kHz)

Notes:

- [1] In the 9999 μF range for measurements to 1000 μF, the measurement accuracy is 1.2 % + 2.
- [2] Amps input burden voltage (typical): 400 mA input 2 mV/mA, 10 A input 37 mV/A.
- [3] 400.0 mA accuracy specified up to 600 mA overload.
- [4] >10 A unspecified.

Function	Range	Resolution	Accuracy ± ( [ % of Reading ] + [ Counts ] )
DC Amps <sup>[3]</sup>	60.00 mA 400.0 mA <sup>[4]</sup> 6.000 A 10.00 A <sup>[5]</sup>	0.01 mA 0.1 mA 0.001 A 0.01 A	1.5 % + 2
Hz <sup>[1], [2]</sup> (ac voltage input )	99.99 Hz 999.9 Hz 9.999 kHz 99.99 kHz	0.01 Hz 0.1 Hz 0.001 kHz 0.01 kHz	0.1 % + 1
MIN MAX AVG	For dc functions, accuracy is the specified accuracy of the measurement function ±12 counts for changes longer than 350 ms in duration. For ac functions, accuracy is the specified accuracy of the measurement function ±40 counts for changes longer than 350 ms in duration.		

Notes:

- [1] Frequency is specified from 2 Hz to 99.99 kHz.
- [2] Below 2 Hz, the display shows zero Hz.
- [3] Amps input burden voltage (typical): 400 mA input 2 mV/mA, 10 A input 37 mV/A.
- [4] 400.0 mA accuracy specified up to 600 mA overload.
- [5] >10 A unspecified.



## Model 77 Series IV

### Calibration Information

Function	Overload Protection <sup>[1]</sup>	Input Impedance (Nominal)	Common Mode Rejection Ratio (1 k $\Omega$ Unbalanced)		Normal Mode Rejection
Volts AC	1000 V	>10 M $\Omega$ <100 pF	>60 dB @ dc, 50 Hz or 60 Hz		
Volts DC	1000 V	>10 M $\Omega$ <100 pF	>120 dB @ dc, 50 Hz or 60 Hz		>60 dB @ 50 Hz or 60 Hz
mV	1000 V <sup>2</sup>	>10 M $\Omega$ <100 pF	>120 dB @ dc, 50 Hz or 60 Hz		>60 dB @ 50 Hz or 60 Hz
		Open Circuit Test Voltage	Full Scale Voltage To:		Short Circuit Current
			6.0 M $\Omega$	50 M $\Omega$	
Ohms/Capacitance	1000 V <sup>2</sup>	< 8.0 V dc	<660 mV dc	<4.6 V dc	<1.1 mA
Continuity/Diode test	1000 V <sup>2</sup>	<8.0 V dc	2.4 V dc		<1.1 mA
[1] 10 <sup>7</sup> V-Hz maximum.					
[2] For circuits <0.3 A short circuit. 660 V for high energy circuits.					

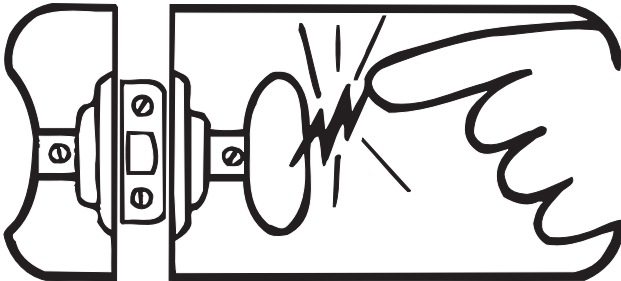
Function	Overload Protection	Overload
mA	Fused, 440 mA, 1000 V FAST Fuse	600 mA overload for 2 minutes maximum, 10 minutes rest.
A	Fused, 11 A, 1000 V FAST Fuse	20 A overload for 30 seconds maximum, 10 minutes rest.



# static awareness



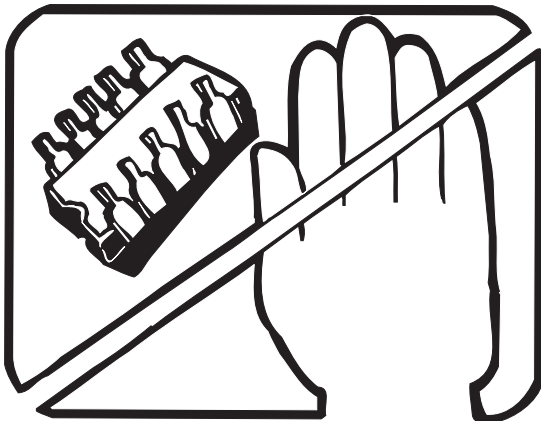
A Message From  
Fluke Corporation



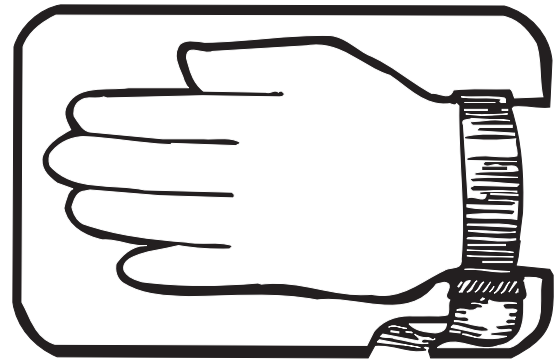
Some semiconductors and custom IC's can be damaged by electrostatic discharge during handling. This notice explains how you can minimize the chances of destroying such devices by:

1. Knowing that there is a problem.
2. Learning the guidelines for handling them.
3. Using the procedures, packaging, and bench techniques that are recommended.

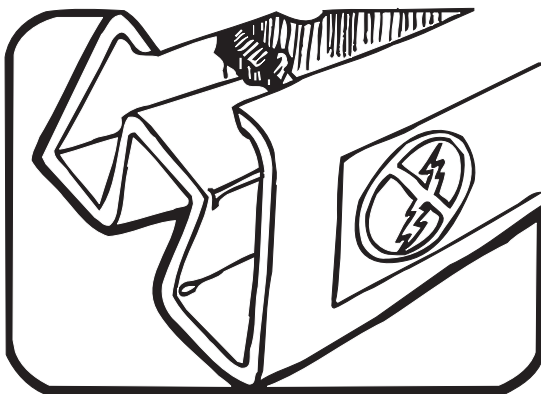
The following practices should be followed to minimize damage to S.S. (static sensitive) devices.



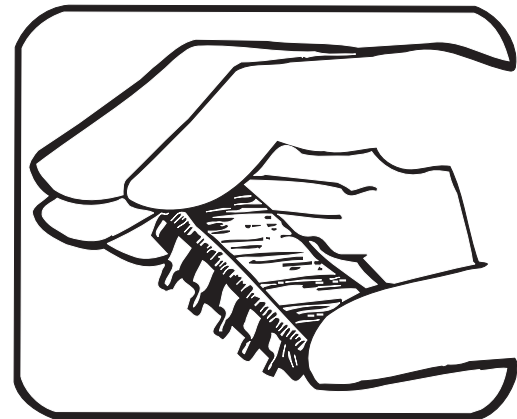
1. MINIMIZE HANDLING



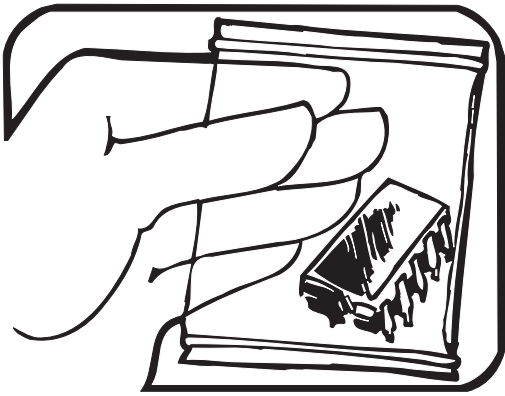
3. DISCHARGE PERSONAL STATIC BEFORE HANDLING DEVICES. USE A HIGH RESISTANCE GROUNDING WRIST STRAP.



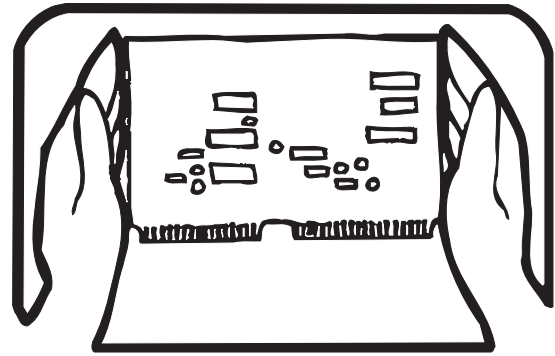
2. KEEP PARTS IN ORIGINAL CONTAINERS UNTIL READY FOR USE.



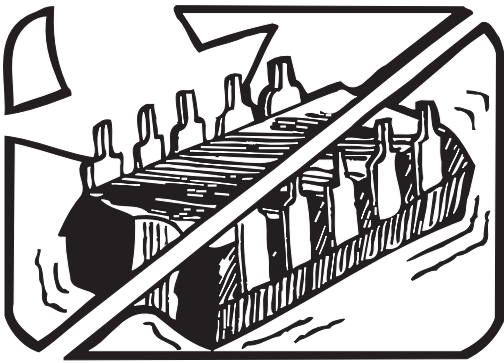
4. HANDLE S.S. DEVICES BY THE BODY.



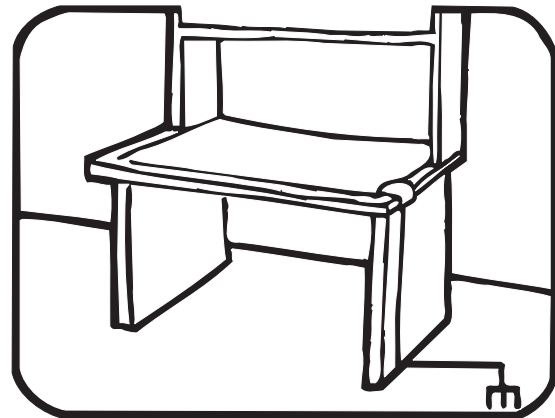
5. USE STATIC SHIELDING CONTAINERS FOR HANDLING AND TRANSPORT.



8. WHEN REMOVING PLUG-IN ASSEMBLIES HANDLE ONLY BY NON-CONDUCTIVE EDGES AND NEVER TOUCH OPEN EDGE CONNECTOR EXCEPT AT STATIC-FREE WORK STATION. PLACING SHORTING STRIPS ON EDGE CONNECTOR HELPS PROTECT INSTALLED S.S. DEVICES.



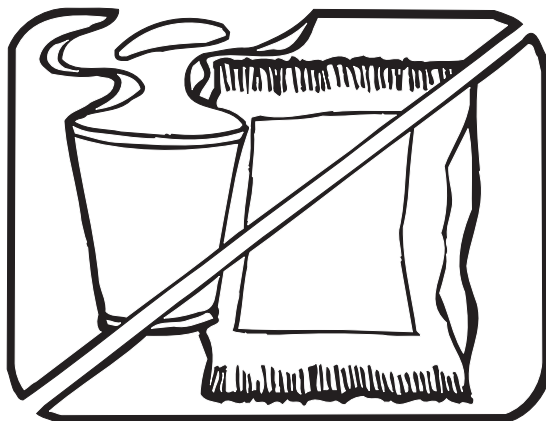
6. DO NOT SLIDE S.S. DEVICES OVER ANY SURFACE.



9. HANDLE S.S. DEVICES ONLY AT A STATIC-FREE WORK STATION.

10. ONLY ANTI-STATIC TYPE SOLDER-SUCKERS SHOULD BE USED.

11. ONLY GROUNDED-TIP SOLDERING IRONS SHOULD BE USED.



7. AVOID PLASTIC, VINYL AND STYROFOAM<sup>®</sup> IN WORK AREA.

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## Testing the Fuses

### ⚠⚠ Warning

To prevent electrical shock or personal injury:

- Remove the test leads and any input signals before replacing the battery or fuses.
- To avoid electrical shock, arc blast, or damage to the Meter, install only fuses with the amperage, interrupt, voltage, and speed ratings specified in Table 4.

To test the fuses (refer to Figure 1):

1. Set the Rotary Switch to  $\Omega$ .
  2. Plug a test lead into the **V $\Omega$ →** terminal and touch the probe to the **400 mA** to test the 440 mA Fuse or **10 A** terminal to test the 11 A Fuse.
- If the display shows a resistance value in the range shown in Figure 1, the fuse is good.
  - If the display reads **OL**, replace the fuse and test again.
  - If the display shows any other value, have the Meter serviced. See “Service Information” earlier in this manual.

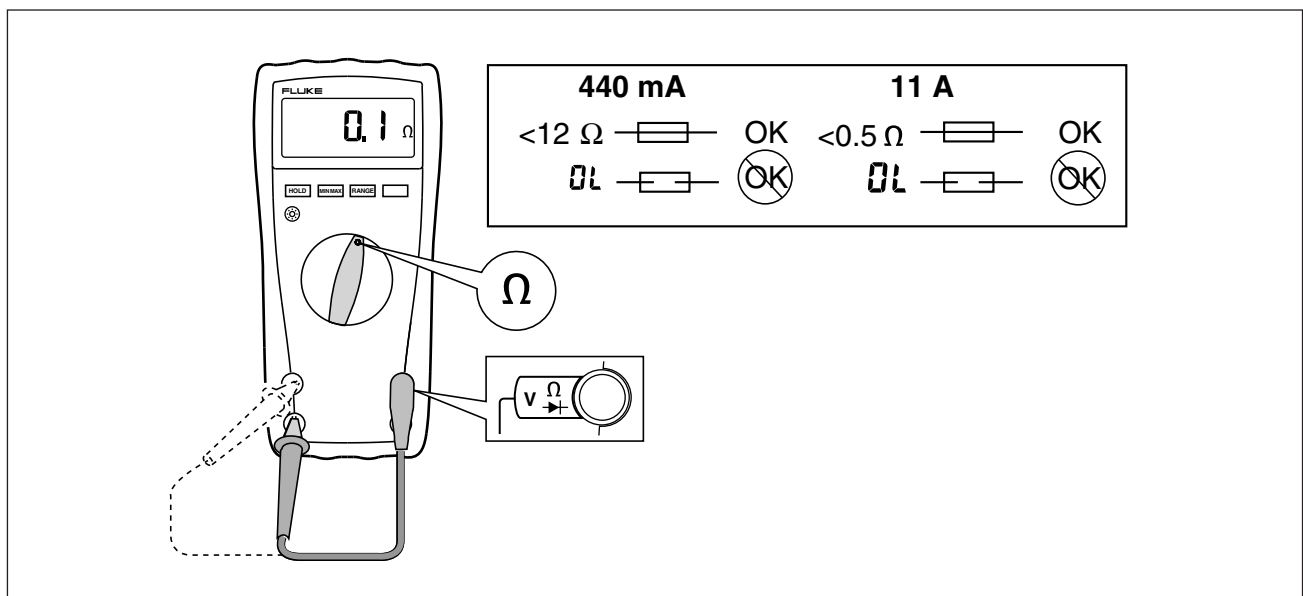


Figure 1. Testing the Current Fuses

## Replacing the Fuses

### ⚠⚠ Warning

To prevent electrical shock, arc blast, or damage to the Meter, install only fuses with the amperage, interrupt, voltage, and speed ratings specified in Table 4.

To replace the Fuses (refer to Figure 2):

1. Turn the Rotary Switch to **OFF**.
2. Disconnect the test leads and/or any connectors from the terminals.
3. Remove the four screws from the Case Bottom and separate the Case Top from the Case Bottom.
4. Remove the fuses F1 and F2 by gently prying one end loose, then slide the fuse out of its bracket, and replace with exact replacement only.
5. Rejoin the Case Bottom, Case Top, Battery compartment door, and reinstall the four screws.

## Replacing the Battery

To replace the Battery (refer to Figure 2):

1. Turn the Rotary Switch to **OFF** and remove the test leads from the terminals.
2. Remove the two screws from the Battery Compartment Door, and remove it from the Case Bottom.
3. Remove the Battery (B1) from the battery connector.
4. Replace the Battery with a new 9 V battery (NEDA A1604, 6F22, or 006P).
5. Reattach the Battery Compartment Door to the Case Bottom, and reinstall the two screws.

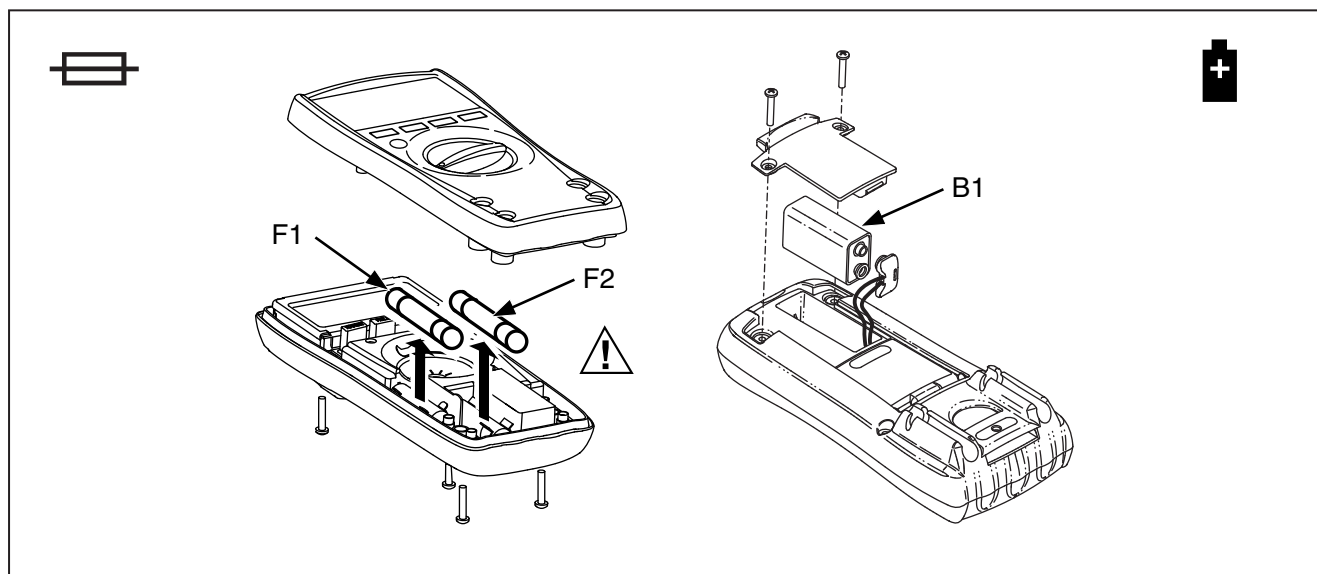


Figure 2. Battery and Fuse Replacement

## Cleaning

### **⚠⚠ Warning**

To prevent electrical shock:

- Remove test leads and any input signals before cleaning.
- Do not reinstall the pca until it is completely dry.
- Dirt or moisture in the terminals can affect readings.

### **⚠ Caution**

To avoid damaging the Meter, do not use aromatic hydrocarbons or chlorinated solvents for cleaning. These solutions will react with the plastics used in the instruments.

Do not use detergents of any kind for cleaning the pca.

Clean the instrument case with a damp cloth and mild detergent.

The pca may be washed with isopropyl alcohol or hot deionized water and a soft brush. Remove excess cleaning material with clean dry air at low pressure, then dry the pca at 50 °C.

## Replacing the LCD

### **⚠ Caution**

To prevent contamination, do not handle the conductive edges of the LCD or the LCD Elastomeric Connectors.

If the edges are contaminated, clean them with alcohol. Allow the alcohol to dry before reassembling.

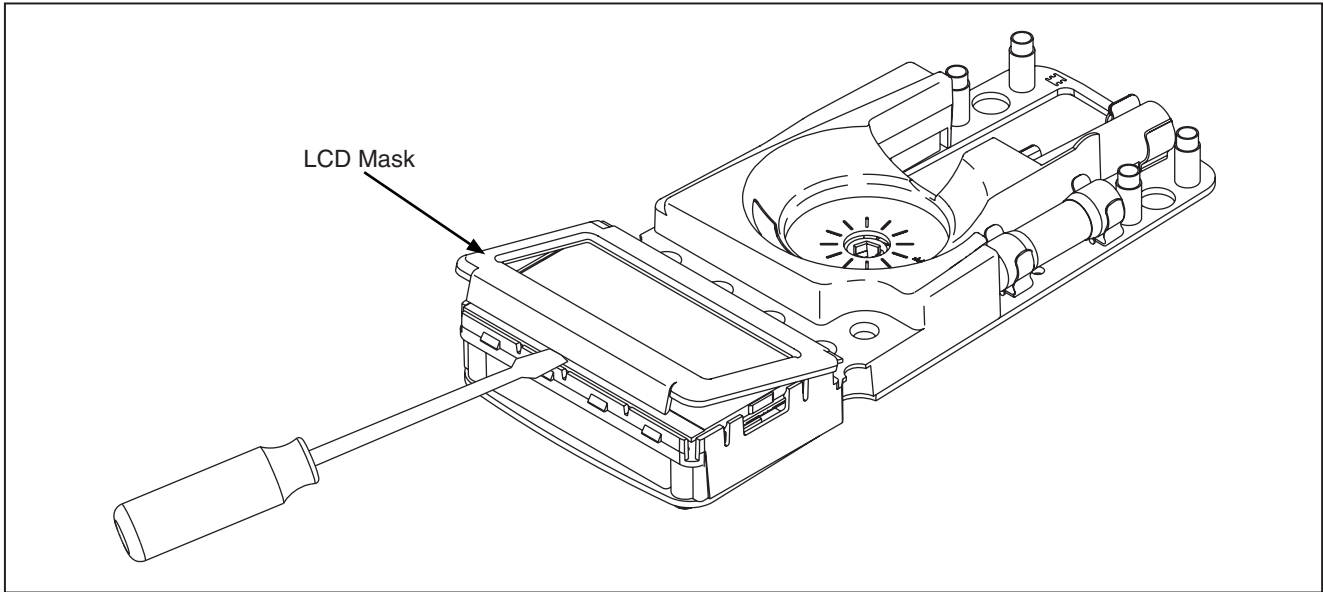
To remove and replace the LCD, perform the following procedure (refer to Figure 3):

1. Turn the rotary switch to **OFF** and remove the test leads from the Meter terminals.
2. Remove the four screws from the case bottom, and separate the case top from the case bottom. The circuit board remains attached to the case bottom.
3. Remove the battery compartment and disconnect the battery from the battery connector.
4. Remove the pca screw located under the 440 mA fuse, and lift the pca out of the case bottom. The beeper is loose in the case. Exercise caution not to damage it.
5. Loosen the four screws in the area of the LCD on the back of the pca. This will facilitate reinstalling the LCD.
6. Insert a small, flat-head screwdriver under the LCD mask edge and gently pry the LCD mask from the snaps.

### **⚠ Caution**

Take care to not break the LCD with the screwdriver.

7. Lift out the LCD.
8. Make sure that all connector contact points are clean. Refer to “Cleaning” for more information.
9. Install a new LCD, taking care that it is correctly oriented.
10. Reattach the LCD Mask to the LCD assembly by snapping the LCD mask into place.
11. Tighten the 4 screws on the back of the pca.
12. Lay the pca back into the case bottom, and screw it down.
13. Reinsert the 440 mA Fuse.
14. Reinstall the battery.
15. Rejoin the case bottom, case top, battery compartment door, and reinstall the four case screws.



aik15f.eps

**Figure 3. Removing the LCD Mask**

### **Performance Tests**

The following performance tests verify the complete operation of the Meter and check the accuracy of each Meter function against its specifications. The recommended calibration interval is 12 months. If the Meter fails any part of the test, calibration adjustment and/or repair is indicated.

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

### Required Equipment

A Fluke 5502A Multi-Product Calibrator (or equivalent) is required for the performance test procedures in this document.

If an equivalent calibrator is used, it must meet the accuracy specifications shown in Table 1.

**Table 1. Calibrator Specifications**

Recommended Equipment	Measurement Function	Minimum required accuracy
5502A Multi-Product Calibrator (or equivalent)	DC Volts	30 mV to 1000 V $\pm 0.075\%$
	DC Current	3 mA to 9 A $\pm 0.375\%$
	AC Volts	50 mV to 1000 V $\pm 0.5\%$ @ 45 Hz to 1 kHz
	AC Current	0.5 mA to 9 A $\pm 0.625\%$ @ 45 Hz to 1 kHz
	Resistance	25 $\Omega$ to 5 M $\Omega$ $\pm 0.125\%$ 10 M $\Omega$ to 40 M $\Omega$ $\pm 0.5\%$
	Capacitance	900 nF $\pm 0.3\%$
	Frequency	5 V, 50 kHz $\pm 0.025\%$

### Preparing for the Performance Test

#### Warning

To prevent 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 (STBY) mode.
- Do not perform the performance test procedures unless the Meter is fully assembled

To prepare for the performance test:

1. Make sure that you have the required equipment (refer to Table 1).
2. Warm up the calibrator as required by its specifications.
3. Allow the temperature of the UUT to stabilize at room temperature (  $23\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$  [ $73\text{ }^{\circ}\text{F} \pm 9\text{ }^{\circ}\text{F}$ ] ).
4. Check the fuses and Battery, and replace them if necessary. Refer to *Testing the Fuses*, *Replacing the Fuses*, and *Replacing the Battery*.



**Performance Tests**

*Note*

When calibrating or measuring ac current, avoid the potential for errors from coupled noise by either:

1. Shorting the  $V\Omega\rightarrow$  to the COM input  
 or
  2. Having **no** connection to the  $V\Omega\rightarrow$  input.
1. Set the Meter's Rotary Switch to the position called for in Table 2, and for all measurements other than current (amps), connect the calibrator to the  $V\Omega\rightarrow$  and **COM** input terminals.
    - If testing the milliamps function, connect the calibrator to the Meter **400 mA** and **COM** input terminals.
    - If testing the amps function, connect the calibrator to the Meter **10A** and **COM** input terminals.
  2. Referring to Table 2 or Table 3, apply the indicated calibrator output voltages to the UUT for each test.
  3. Verify that the UUT displays a reading that is within the limits shown in the Meter Response column.

**Table 2. Performance Tests**

Steps	Test (Switch Position)	5502 Output	Meter Response	
			Lower Limit	Upper Limit
1	$\Omega$ Ohms <sup>[2]</sup>	500 $\Omega$	497.3 $\Omega$	502.7 $\Omega$
2		5 k $\Omega$	4.974 k $\Omega$	5.026 k $\Omega$
3		50 k $\Omega$	49.74 k $\Omega$	50.26 k $\Omega$
4		5 M $\Omega$	4.974 M $\Omega$	5.026 M $\Omega$
5		10 M $\Omega$	9.79 M $\Omega$	10.21 M $\Omega$
6		40 M $\Omega$	39.19 M $\Omega$	40.81 M $\Omega$
7	))) Continuity	25 $\Omega$	Beeper On	
8		250 $\Omega$	Beeper Off	
9	$\tilde{V}$ AC Volts	50 mV 45 Hz	0.047 V ac	0.053 V ac
10		5 V 45 Hz	4.898 V ac	5.102 V ac
11		5 V 1 kHz	4.898 V ac	5.102 V ac
12		50 V 45 Hz	48.98 V ac	51.02 V ac
13		50 V 1 kHz	48.98 V ac	51.02 V ac
14		500 V 45 Hz	489.8 V ac	510.2 V ac
15		500 V 1 kHz	489.8 V ac	510.2 V ac
16		1000 V 45 Hz	978 V ac	1022 V ac
17		1000 V 1 kHz	978 V ac	1022 V ac

**Table 2. Performance Tests (cont)**

Steps	Test (Switch Position)	5502 Output	Meter Response	
			Lower Limit	Upper Limit
18	$\tilde{V}$ Hz AC Volts Frequency <sup>[1]</sup>	5 V 99 Hz	98.89 Hz	99.11 Hz
19		5 V 900 Hz	899 Hz	901 Hz
21		5 V 50 kHz	49.94 kHz	50.06 kHz
22	$\bar{V}$ DC Volts	5 V	4.984 V dc	5.016 V dc
23		50 V	49.84 V	50.16 V
24		300 V	299.0 V dc	301.0 V dc
25		1000 V	996 V dc	1004 V dc
26		-1000 V	-1004 V dc	-996 V dc
27	$\bar{mV}$ DC Millivolts	30 mV	29.8 mV dc	30.2 mV dc
28		-300 mV	-301.0 mV dc	-299.0 mV dc
29		600 mV	598.1 mV dc	601.9 mV dc
30	$\text{⊕}$ Capacitance <sup>[1]</sup>	900 nF	887 nF	913 nF
31		9 $\mu$ F	8.87 $\mu$ F	9.13 $\mu$ F
32		90 $\mu$ F	88.7 $\mu$ F	91.3 $\mu$ F
33	$\rightarrow$ Diode Test <sup>[1]</sup>	2.0 V	1.978 V dc	2.022 V dc
34	$\rightarrow$ Diode Test <sup>[1]</sup> $\tilde{mA}$ AC Milliamps	0.5 mA 45 Hz	0.47 mA ac	0.53 mA ac
35		50 mA 1 kHz	48.73 mA ac	51.27 mA ac
36		400 mA 1 kHz	389.8 mA ac	410.2 mA ac
37	$\tilde{A}$ AC Amps	4.0 A 45 Hz	3.898 A ac	4.102 A ac
38		9.0 A 1 kHz	8.75 A ac	9.25 A ac
39	$\bar{mA}$ DC Milliamps <sup>[1]</sup>	3 mA, 0 Hz	2.93 mA dc	3.07 mA dc
40		50 mA	49.23 mA dc	50.77 mA dc
41		-400 mA	-406.2 mA dc	-393.8 mA dc
42	$\bar{A}$ DC Amps <sup>1</sup>	4.0 A	3.938 A dc	4.062 A dc
43		-9.0 A	-9.16 A dc	-8.84 A dc




1. Press the YELLOW button to access this function.

2. Does not include test lead resistance.

## Calibration Adjustment

Perform the calibration adjustment procedures if the Meter fails the performance tests.

The Meter buttons behave as follows when the calibration mode is enabled:

- |   |  |
|---|--|
|  | Press and hold this button to test the present function. This measurement is uncalibrated and may be inaccurate. This is normal.   |
|  | Press and hold this button to display the required input.  |
|  | Press this YELLOW button to store the calibration value and advance to the next step. This button is also used to exit calibration mode after the calibration adjustment sequence is complete. |

## Calibration Adjustment Procedure

Use the following steps to adjust the Meter's calibration:

Switch the Meter to  $\overline{\text{mV}}$  DC.

1. Turn the Meter over and find the Calibration Seal located near the top of the Meter (refer to Figure 4).
2. With a small probe, break the Calibration Seal and press the Calibration Button for 1 second. The Meter will beep and change to the calibration mode. The display reads  $\text{[-0]}$ , designating the first calibration step. The Meter remains in calibration mode until the Rotary Function Switch is turned off.
3. Proceed through the calibration steps by entering the input value listed in the table for each step.

### Note

*When calibrating or measuring ac current, avoid the potential for errors from coupled noise by either:*

1. *Shorting the  $\text{V}\Omega\rightarrow$  to the COM input*
- or*
2. *Having NO connection to the  $\text{V}\Omega\rightarrow$  input.*

### Note

*After pressing the yellow button, wait until the step number advances before changing the calibrator source or turning the Rotary Switch.*

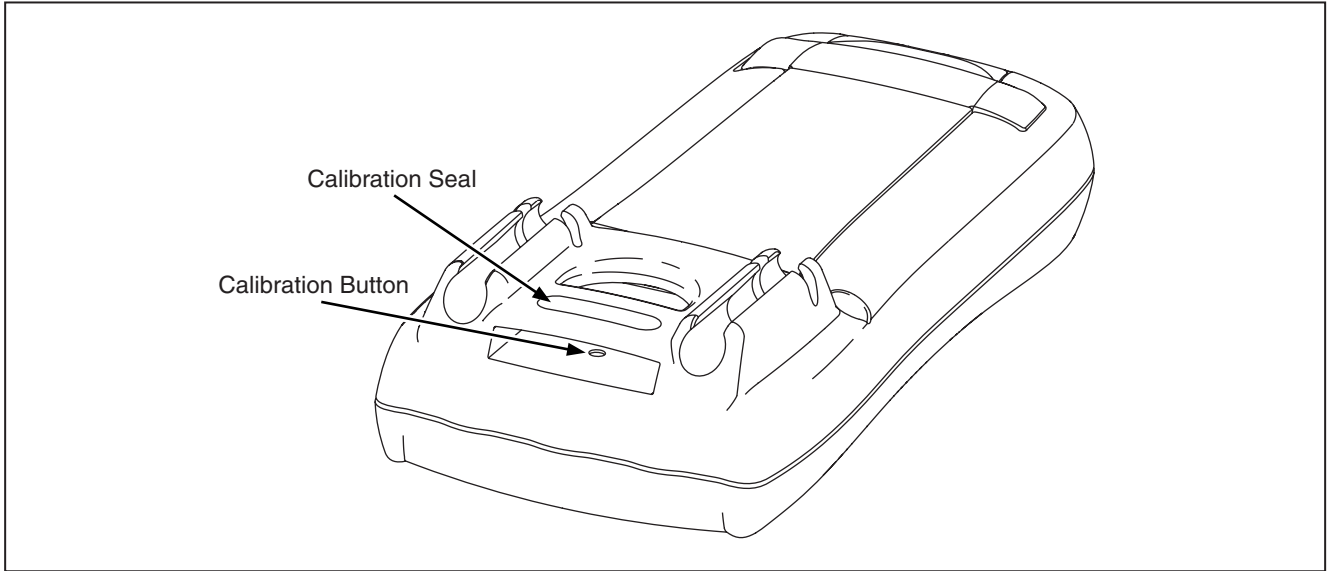
4. After each input value is applied, press the yellow button to accept the value and proceed to the next step ( $\text{[-0]}$  and so forth).
5. When the last step in a function is reached, turn the Rotary Function Knob to the next required function. The Meter will not allow a step to be completed if the Rotary Function Knob is turned to the wrong function.

### Note

*If the calibration adjustment procedure is not completed correctly, the Meter will not operate correctly. When calibration adjustment is not performed correctly, the Meter displays the messages  $\text{[CAL]}$  and  $\text{[Err]}$  and the Meter must be recalibrated.*

*The Meter is damaged and requires service if:*

- $\text{[CAL]}$  and  $\text{[Err]}$  messages continue to appear after a proper recalibration.
- $\text{[EEPr]}$  and  $\text{[Err]}$  messages are alternating on the display.
- $\text{[EEPr]}$  message appears on the display.



**Figure 4. Calibration Access**

**Table 3. Calibration Steps**

Function (Switch Position)	Calibration Step	Input Value
$\overline{\text{mV}}$ (DC Millivolts)	[ - 0 1	600.0 mV dc
	[ - 0 2	120.0 mV dc
$\overline{\text{V}}$ (DC Volts)	[ - 0 3	6.000 V dc
	[ - 0 4	60.00 V dc
	[ - 0 5	600.0 V dc
$\sim \text{V}$ (AC Volts)	[ - 0 6	600.0 mV, 60 Hz
	[ - 0 7	600.0 V, 60 Hz
$\Omega$ (Ohms)	[ - 0 8	600.0 $\Omega$
	[ - 0 9	6.000 k $\Omega$
	[ - 1 0	60.00 k $\Omega$
	[ - 1 1	600.0 k $\Omega$
	[ - 1 2	6.000 M $\Omega$
$\rightarrow   \text{—}$ (Diode Test)	[ - 1 3	5.000 V dc
<b>mA</b> (Milliamps)	[ - 1 4	400.0 mA dc
	[ - 1 5	400.0 mA ac, 60 Hz
<b>A</b> (Amps)	[ - 1 6	6.000 A dc
	[ - 1 7	6.000 A ac, 60 Hz

\* If the Meter is not connected correctly, or if the rotary switch is in the wrong position, the Meter will beep 2 times to alert the user.



## Replaceable Parts and Accessories

Replaceable parts and accessories are shown in Table 4 and Figure 5.

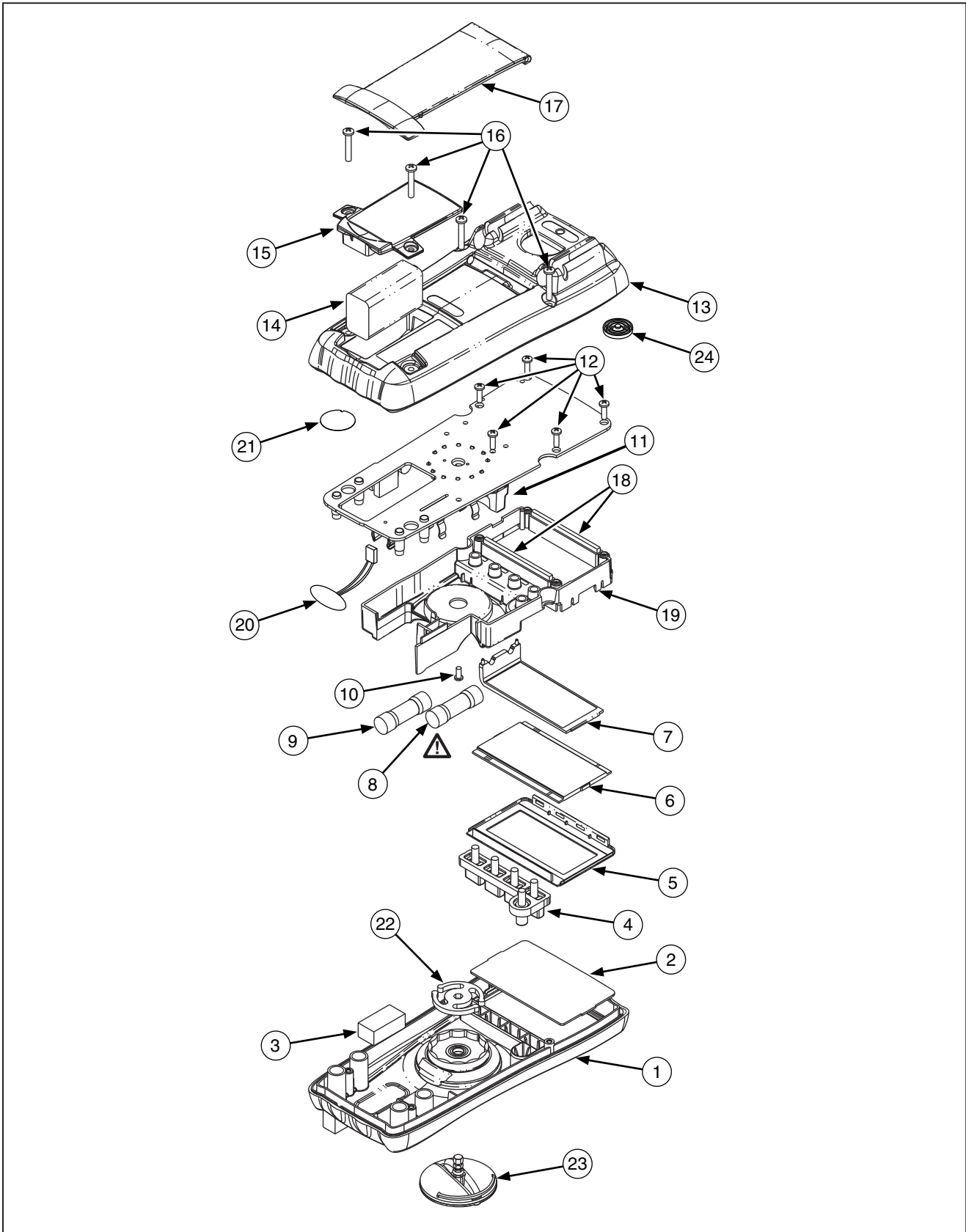
### Warning

**To prevent electric shock, injury, or damage to the meter, use exact replacement parts only.**

**Table 4. Replaceable Parts**

Item	Description	Part No	Qty
--	(Not shown) TL75 Test Lead Set*	855705	1
--	(Not Shown)		
	77 Series IV Users Manual (English only)	2695884	1
	77 Series IV Users Manual CD (English, and all translated versions)	2695825	1
1	Case Top	2695766	1
2	Window	648714	1
3	Shock Absorber	428441	1
4	Keypad	1560052	1
5	LCD Mask	2695775	1
6	LCD	1560856	1
7	LCD Light Pipe	1564806	1
8	 Fuse, 11 A, (fast acting), 1000 V ac/dc, minimum interrupt rating 17 kA	803293	1
9	 Fuse, 440 mA (fast acting), 1000 V ac/dc, minimum interrupt rating 10 kA	943121	1
10	PCA Screw	1626602	1
11	AC Shield	648755	1
12	AC Shield and Internal Cover screws	448456	5
13	Case Bottom (includes bottom shield and calibration button)	2095692	1
14	Battery, 9 V (Alkaline, 9 V, 0-200 mA)	614487	1
15	Battery Compartment Door	1564799	1
16	Case Screws	832246	4
17	Tilt Stand	648961	1
18	LCD Elastomeric Connector	650264	2
19	Internal Cover	1564786	1
20	Battery Connector	1988201	1
21	Beeper	2041050	1
22	Switch Detent Spring	822643	1
23	Switch Knob	648706	1
24	Calibration Button	1564889	1

\* Fluke accessories are available from your authorized Fluke distributor.



**Figure 5. Replaceable Parts and Accessories**