

FLUKE®

79/26


Series III Multimeter

Instruction Sheet




Read First: Safety Information

- Never use the meter if the meter or test leads look damaged.
- Be sure the test leads and switch are in the correct position for the desired measurement.
- Never measure resistance in a circuit when power is applied.
- Never touch the probe to a voltage source when the test leads are plugged into the 10 A or 40 mA input jack.
- Never apply more than rated voltage between any input jack and earth ground.
- Be careful when working with voltages above 60 V dc or 30 V ac rms. Such voltages pose a shock hazard.
- Keep your fingers behind the finger guards on the test probes when making measurements.

Warning

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

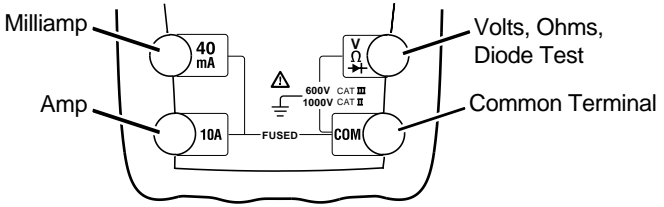
Symbols

-  Read First: Safety Information
-  Dangerous Voltage May Be Present
-  Double Insulation

Overvoltage Installation Category per IEC 1010:

- CAT II Typical locations include main wall outlets, local appliances, and portable equipment.
- CAT III Typical locations include switches in the fixed installation and equipment for industrial use permanently connected to the fixed installation.

Input Jacks



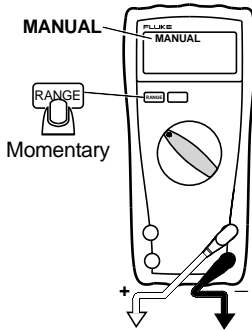
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See Specifications for overload protection.

Ranging

The meter defaults to autorange when you turn on the meter.

Manual ranging is available in V ac, V dc, Hz, ohms, capacitance, A ac, and A dc.

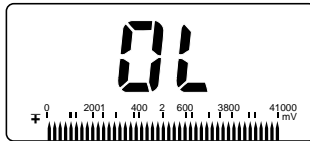


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To return to autorange, press **RANGE** for 1 second or turn the rotary switch.

Bar Graph

The bar graph shows readings relative to the full scale value of the displayed measurement range and indicates polarity.



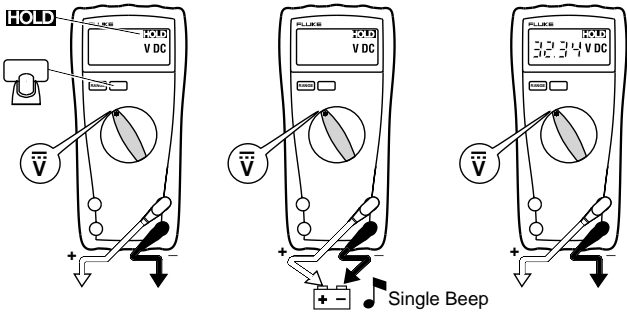
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Automatic Touch Hold® Mode

⚠ Warning

To avoid electric shock, do not use the Touch Hold® mode to determine if a circuit with high voltage is dead. The Touch Hold® mode will not capture unstable or noisy readings.

The Touch Hold® mode automatically captures and displays a stable voltage reading.



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When the meter detects a new input, it beeps and displays a new reading.

Stray voltages can cause the meter to display a new reading.

To exit the Touch Hold® mode, press the yellow key a second time or turn the rotary switch.

Smoothing Displayed Readings

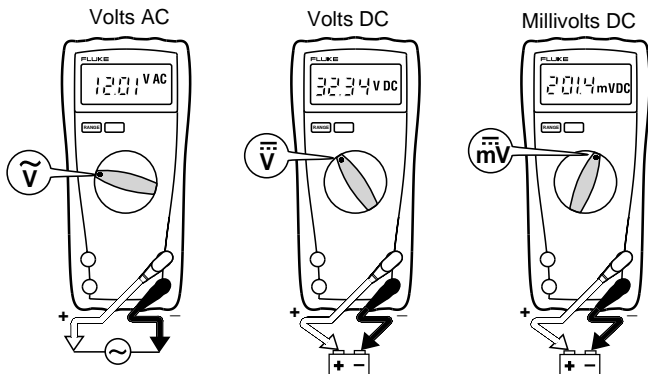
Smoothing displays the average of eight readings. When the input signal changes rapidly, smoothing makes the digital display readings more stable. Smoothing does not work in continuity, Lo-Ohms, and capacitance.

To select Smoothing, press the yellow key while turning on the meter.

Standby

If the meter is on but is inactive for an hour (20 minutes in diode test), the screen only displays four bar graph segments. To resume operation, turn the rotary switch or press a button.

AC and DC Voltage (\tilde{V} \bar{V} $m\bar{V}$)



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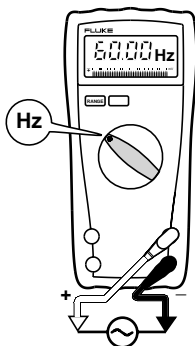
In the mV dc function, the meter defaults to 400 mV. To enter the 40 mV range, press **[RANGE]** momentarily.

Frequency (Hz)

The bar graph indicates the ac voltage present.

⚠ Warning

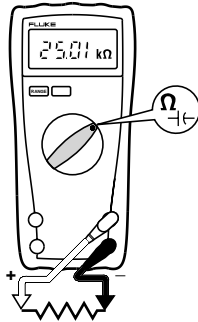
To avoid electric shock, disregard the bar graph when frequency is > 1 kHz. If the frequency of the measured signal is > 1 kHz, the bar graph voltage is unspecified.



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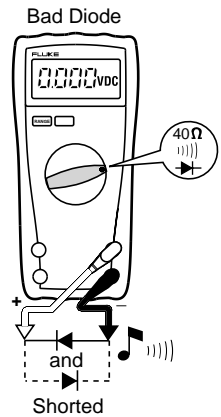
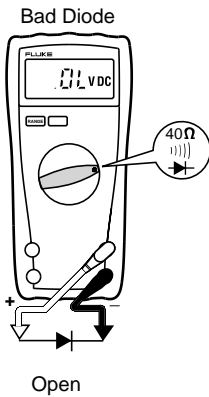
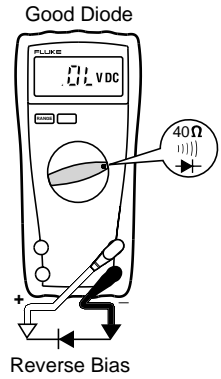
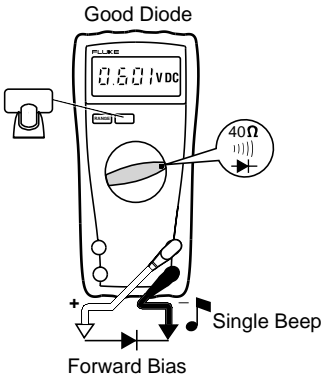
Resistance (Ω)

Turn off the power and discharge all capacitors. An external voltage across a component will give invalid resistance readings.



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Diode Test (\rightarrow)

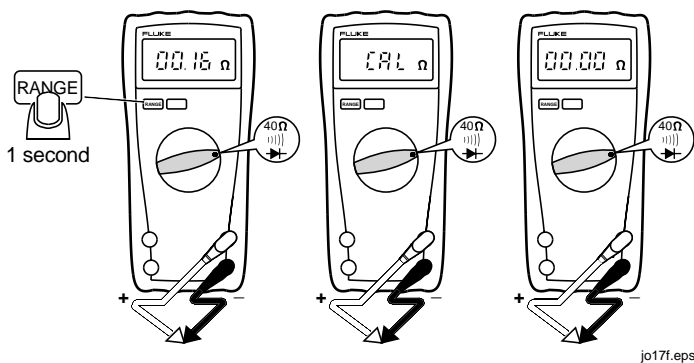


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Press **[RANGE]** 1 second to turn the beeper off.

Lead Resistance Compensation

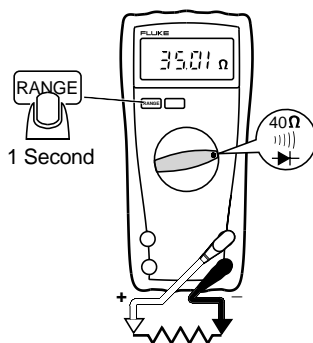
This function compensates for resistance in the leads and the meter's internal protection circuitry. You can compensate in either Lo-Ohms or continuity.



When zero is displayed, compensation has occurred. The meter stays compensated until you change functions.

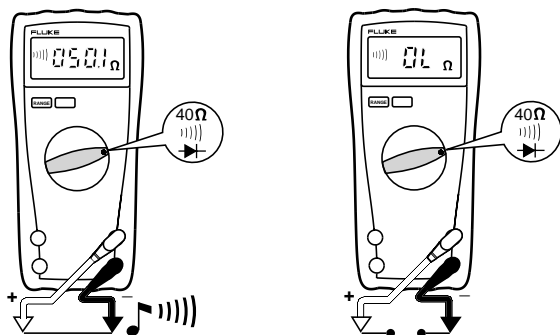
Lo-Ohms (40 Ω)

The Lo-Ohms (40 Ω) function improves noise rejection and resolution, but is less accurate than the ohms function. In this function, the beeper is turned off.



To compensate for the lead resistance, see “Lead Resistance Compensation.”

Continuity Test (||||)

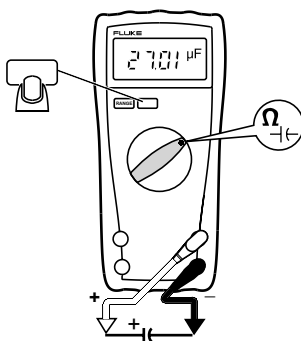


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Opens or shorts > 1 ms are detected. Press **RANGE** momentarily for lead compensation. Press **RANGE** 1 second to turn the beeper off and place the meter into Lo-Ohms autoranging.

Capacitance (—|—)

Turn off the power and discharge the capacitor. If the capacitor requires more discharging, **diSC** displays while the capacitor discharges.



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For rated accuracy in the lowest two capacitance ranges, subtract the open-lead reading from the measurement.

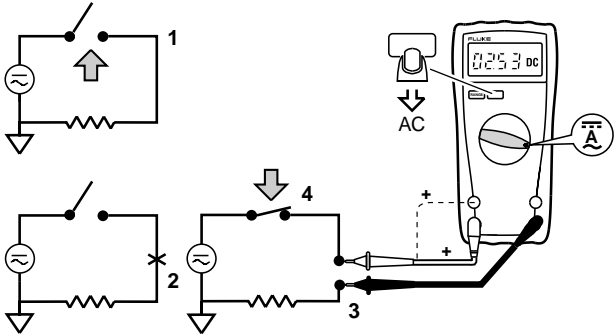
Current (~ —|—)

⚠ Warning

To avoid injury, do not attempt a current measurement if the open circuit voltage exceeds the rated voltage of the meter.

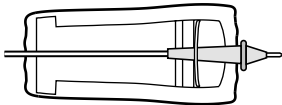
To avoid blowing an input fuse, use the 10 A jack until you are sure that the current is less than 40 mA.

Turn off power to the circuit. Break the circuit. (For circuits of more than 10 amps, use a current clamp.) Put the meter in series with the circuit as shown and turn power on.



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Probe Holder



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Maintenance

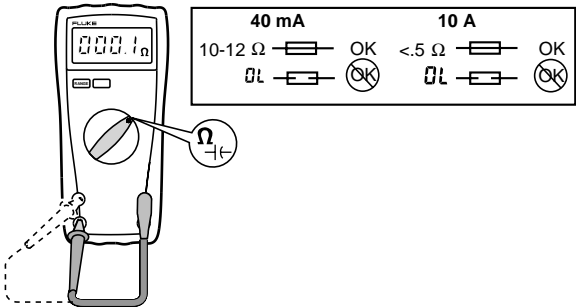
Warning

To avoid electric shock, remove the test leads before opening the case, and close the case before using the meter. To prevent fire and possible arc-flash, use fuses with ratings shown on the back of the meter.

Caution

To avoid contamination or static damage, do not touch the circuit board without proper static protection.

Internal Fuse Test

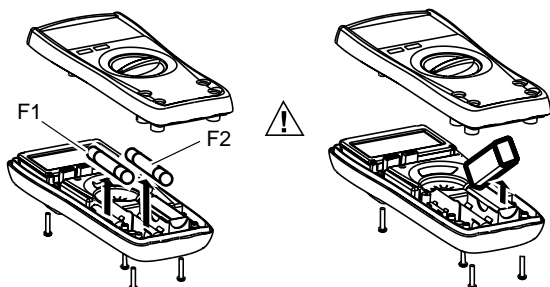


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Battery and Fuse Replacement

Note

Before opening the case, make sure the test leads are removed and the rotary switch is turned to OFF.



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Cleaning

To clean the meter, use a damp cloth and mild detergent; do not use abrasives or solvents on the meter.

Service and Parts

To contact Fluke, call one of the following telephone numbers:

USA and Canada: 1-888-99-FLUKE (1-888-993-5853)

Europe: +31 402-678-200

Japan: +81-3-3434-0181

Singapore: +65-*--276-6196

Anywhere in the world: +1-425-356-5500

Or, visit Fluke's Web site at www.fluke.com.

Item	Description	Fluke PN	Quan.
BT1	Battery, 9 V Alkaline (NEDA 1604A/ IEC 6LR61)	614487	1
F1*	Fuse, F44/100 A, 1000 VAC/DC Min Interrupt Rating 10 kA	943121	1
F2*	Fuse, F11 A, 1000 VAC/DC, Min Interrupt Rating 17 kA	943118	1






* For safety, use exact replacement

True RMS and Crest Factor

True rms sensing provides accurate readings on sinusoidal signals and on signals with harmonics or distorted waveforms. True rms readings indicate the true heat-providing current which may cause overheated conductors, connections, breakers, or transformers.

Crest factor (CF) is the peak signal value divided by the rms signal value and defines the dynamic range of the meter. A sine wave has a CF = 1.4.

Specification

Accuracy specifications: ±[% of reading] + [number of least significant digits])	1 year, 18°C to 28°C (64°F to 82°F) ≤ 90% RH
Display	Digital: 4000 counts, updates 4/sec Analog: 63 segments, updates 40/sec Frequency: 9,999 counts Capacitance: 9,999 counts
Response Time of Digital Display	V ac < 1.5 s V dc < 1 s Ω <1 s to 40 kΩ, <2 s to 4 MΩ, <10 s to 40 MΩ
Operating Temperature	0°C to 55°C
Storage Temperature	-40°C to 60°C
Temperature Coefficient	0.1 x (specified accuracy)/°C (<18°C or >28°C)
Relative Humidity	90% (0°C to 30°C) 75% (30°C to 40°C) 45% (40°C to 50°C) 35% (50°C to 55°C)
Altitude	Operating: 2000 meters Storage: 12,000 meters
Battery Type	9 V, NEDA 1604A or IEC 6LR61
Battery Life	500 hrs typical with alkaline
Continuity Beeper	4096 Hz
Vibration	per MIL-T-PRF 28800F Class III, Sinusoidal, Non Operating
Drop	1 meter drop per IEC 1010-1
Enclosure	Conforms to IP-40 per IEC-529
Size (H x W x L)	3.7 cm x 8.9 - 7.8 cm x 19 cm (1.5 in x 3.5 - 3.1 in x 7.49 in)
Weight	365 g (12.9 oz)
Electromagnetic Compatibility	V ac and A ac only: RF field = 3 V/m. Total accuracy = specified accuracy + 2.0% of range. EN 61326-1: 1997
Surge Protection	6 kV peak per IEC 1010-1, 1990-09
Safety	600 V CAT III and 1000 V CAT II per ANSI/ISA-S82.01-94, UL3111-1, CSA/CAN C22.2 No 1010.1-92, EN 61010 part 1:1993.
Certification	    

AC readings are ac-coupled, true rms, and are valid from 5% to 100% of range for CF 1.4. For crest factors other than 1.4, add $\pm(2\%$ or reading + 2% of range). Maximum CF is 3 at full scale, 6 at half scale.

Function	Range	Accuracy
\tilde{V} (45 Hz to 1 kHz)	400.0 mV	$\pm(1.9\%+4)$
	4.000 V	$\pm(1.9\%+2)$
	40.00 V, 400.0 V, 1000 V	$\pm(1.5\%+2)$
\overline{V}	4.000 V, 40.00 V, 400.0 V, 1000 V	$\pm(.3\%+1)$
$m\overline{V}^*$	40.00 mV	$\pm(.3\%+5)$
	400.0 mV	$\pm(.3\%+1)$
Ω	400.0 Ω	$\pm(0.4\%+2)$
	4.000 k Ω , 40.00 k Ω , 4.000 M Ω	$\pm(0.4\%+1)$
	400.0 k Ω	$\pm(0.6\%+1)$
	40.00 M Ω	$\pm(1\%+3)$
Capacitance	99.99 nF, 999.9 nF, 9.999 μ F,	$\pm(1.9\%+2)^{**}$
	99.99 μ F, 999.9 μ F	$\pm(1.9\%+2)^{**}$
	9999 μ F	$\pm 10\%$ typical
\llcorner	400 Ω	5% typical ^{***}
40 Ω	40.00 Ω^* , 400.0 Ω ,	5% typical ^{***}
\rightarrow	2.450 V	$\pm 2\%$ typical
<p>* In 40 Ω and 40 mV ranges, thermals may introduce additional errors. Maximum accuracy is obtained when both probe tips are maintained at the same temperature.</p> <p>** Accuracy applies when measuring film capacitors or better and the open lead reading is subtracted from the measurement. This meter uses a dc-type measurement technique.</p> <p>*** Accuracy applies after lead resistance compensation.</p>		

Function	Range	Resolution	Accuracy	Burden Voltage
\tilde{A} (45 Hz to 1 kHz)	4.000 mA	0.001 mA	$\pm(1.5\%+4)$	11 mV/mA
	40.00 mA	0.01 mA	$\pm(1.5\%+2)$	11 mV/mA
	4 A	0.001 A	$\pm(1.5\%+4)$	0.03 V/A
	10.00 A*	0.01 A	$\pm(1.5\%+2)$	0.03 V/A
\overline{A}	4.000 mA	0.001 mA	$\pm(0.5\%+5)$	11 mV/mA
	40.00 mA	0.01 mA	$\pm(0.5\%+2)$	11 mV/mA
	4 A	0.001 A	$\pm(0.5\%+5)$	0.03 V/A
	10.00 A*	0.01 A	$\pm(0.5\%+2)$	0.03 V/A
* 10 A continuous, 20 A for 30 seconds.				

Function	Range	Accuracy
Frequency*	99.99, 999.9, 9.999 kHz, 20.00 kHz	$\pm(0.01\%+1)$
*For rectangular waveforms $25\% \leq \text{duty cycle} \leq 75\%$, $V_{ac} \leq 1 \text{ kHz}$		

Frequency Counter Sensitivity

Input Range*	Minimum Sensitivity (RMS Sine Wave)	
	500 Hz to 20 kHz	1.0 Hz to 500 Hz**
4 V ac	0.3 V	0.7 V
40 V ac	3 V	7 V
400 V ac	30 V	70 V
1000 V ac	300 V	Not Applicable
* Maximum input for specified accuracy = $10 \times \text{Range}$ or 1000 V		
** Display rattle for sine waves below 500 Hz = 5 counts		

Function	Input Impedance (Nominal)		
\bar{V} , $m\bar{V}$, \tilde{V}	>10 M Ω , <100 pF		
	Common Mode Rejection Ratio (1 kΩ Unbalanced)	Normal Mode Rejection	
\bar{V} , $m\bar{V}$	>120 dB at dc, 50 Hz, or 60 Hz	>60 dB at 50 Hz or 60 Hz	
\tilde{V}	>60 dB, dc to 60 Hz		
	Open Circuit Test Voltage	Full Scale Voltage	
Ω	<1.3 V dc	To 4.0 M Ω	40 M Ω
\rightarrow	<3.1 V dc	2.45 V dc	
	Short Circuit Current		
Ω	<250 μ A		
\rightarrow	<600 μ A		
* 10^7 V-Hz max.			