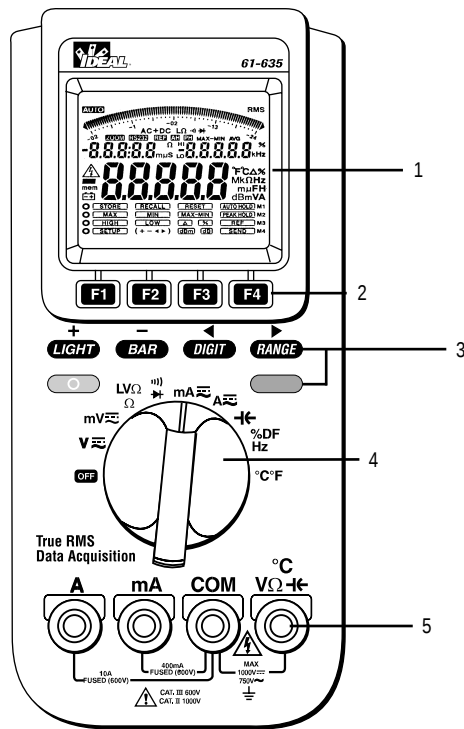
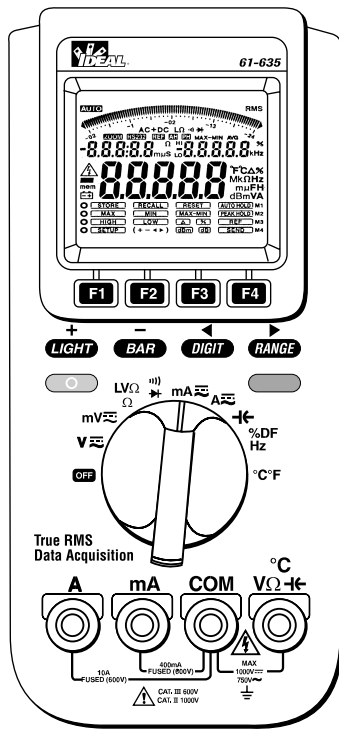




#61-633
#61-635

630 Series Technician Grade Multimeter



1. LCD Display
2. LCD Menu Function Buttons
3. Function Buttons
4. Rotary Function Switch
5. Input Connectors

WARNING!

1. DO NOT UNDER ANY CIRCUMSTANCES EXCEED THESE RATINGS:

- Voltage is not to exceed 1000 Volts.
- Resistance, Capacitance, Logic and Continuity functions are not to be performed on circuits capable of delivering greater than 600 Volts.
- Current measurements are not to be performed on circuits capable of delivering greater than 500 Volts

2. To avoid electrical shock hazards and/or damage to the meter:

- Do not exceed the voltage ratings for the meter. Use caution when measuring voltage.
- Do not use during electrical storms. AC power sources with inductive loads or electrical storms may result in high voltage. High energy transients can damage meter and present a dangerous shock hazard.
- Turn off power to the circuit or device being measured before taking resistance and capacitance measurements. Fully discharge all capacitors before measuring.

3. Ensure meter is in proper working order before using. Visually inspect meter for damage. Performing a continuity check can verify proper operation. If the meter reading goes from overload to zero, this typically means the meter is in proper working order.

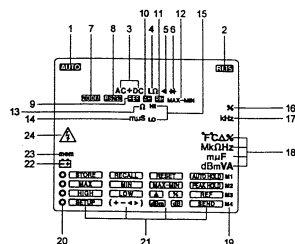
4. Visually inspect leads for damage before using. Replace if insulation is damaged or leads appear suspect.

5. Never ground yourself when taking electrical measurements. Do not touch exposed metal pipes, outlets, fixtures etc. Keep your body isolated from ground by using dry clothing, rubber shoes, mats, or any other approved insulating material. Keep your fingers behind the finger guards on the probes. Work with others.

6. Before beginning all unknown measurements, set meter to highest possible range.

7. Before breaking a circuit for testing, turn off the power to the circuit. When disconnecting from a circuit, disconnect the hot lead first, then the common lead.

8. Disconnect the meter from the circuit before turning off any indicator, including motors, transformers and solenoids.



1. Auto range indicator
2. True RMS mode indicator
3. AC, DC and AC+DC mode indicators
4. Low voltage resistance and resistance indicators
5. Continuity check indicator
6. Diode test indicator
7. Zoom indicator for bargraph
8. Sending data indicator (RS-232)
9. Reference mode indicator
10. Auto hold indicator
11. Peak hold indicator
12. Maximum, minimum, and maximum-minimum indicators
13. Loading resistance indicator
14. Period indicators
15. High and low limit indicators with beeper guard
16. Percent indicator
17. Frequency indicator
18. Main display unit indicators
19. Menuline indicators
20. Menuline mark indicators
21. Menu function indicator
22. Low battery indicator
23. Memory indicator
24. High voltage input warning (>60VDC, 300VAC rms)

LCD Menu Function Buttons

- Use the **O** button to select the row of the function menu. The rows number is labeled on the right hand side. The active row is marked with a **O** indicator on the left end of the line.
- Use the **F1**, **F2**, **F3** and **F4** buttons to select the column of the function menu. The selected menu function will be outlined with a .
- The Menu Function Indicator will appear in Recall, Setup, Setting, High or Low modes. When this is displayed, the Light, Bar, Digit and Range buttons will be changed to increase (+), decrease (-), left shift (←) and right shift (→) functions.
- Operating results obtained in the various menu functions which are not stored in memory will be lost when the meter is taken out of the menu function and returned to active measurements.

Store

- Pressing the **F1** button while the **O** indicates row M1 activates the store function.
- Up to seven data points can be stored.
- Pressing **F1** will store the first data point.
- Pressing **F1** again will store the second data point, etc.
- The captured data will be displayed in the secondary display.
- The data points stored in memory will be cleared when changing ranges, or the measurement on the rotary function switch.

Recall

- Pressing the **F2** button while the **O** indicates row M1 activates the recall function.
- While in recall mode, the ← and → buttons will scroll through the stored data points.
- Stored data will be displayed on the secondary display.
- Pressing the **F2** button while in recall mode returns the unit to active measurements.

Reset

- Pressing the **F3** button while the **O** indicates row M1 activates the reset function.
- The reset button clears all stored data points, and resets the High and low limits, and REF value to the default settings.

Auto Hold

- Pressing the **F4** button while the **O** indicates row M1 activates the auto hold function.
- The auto hold function is activated when a stable reading is achieved.
- The meter will beep when the meter captures the value in auto hold.
- The held value will be displayed in the secondary display with the **AH** annunciator.
- Pressing the **F4** button while in auto hold mode returns the unit to active measurements.

Max, Min, Max-Min

- Pressing the **F1**, **F2** or **F3** button while the **O** indicates row M2 activates these functions.
- The maximum, minimum and maximum-minimum values are displayed in the secondary display when these functions are activated.
- These values are the most recent values, and cleared by the reset function.

Peak Hold

- Pressing the **F4** button while the **O** indicates row M2 activates the peak hold function.
- In peak hold mode, pressing **F1**, **F2** or **F3** will display the peak hold maximum, minimum and maximum-minimum values.
- The beeper sounds when new minimum or maximum values are detected.
- Pressing the **F4** button while in peak hold mode returns the unit to active measurements.

High and Low Limit

- Pressing the F1 or F2 button while the O indicates row M2 activates the high or low limit function.
- The high limits may be set by pressing the F1 button and using the +, -, ◀ and ▶ buttons to set the values in the secondary display.
- The first digit of the high limit value will blink, indicating that it can be changed.
- Press the ◀ and ▶ buttons to move left and right through the high limit value to select the appropriate digit to be changed.
- The + and – buttons will increase or decrease the value of the blinking digit.
- Pressing F1 will save the high limit value.
- Repeat this process to set the lower limit using the F2 key.
- Once these values have been set, the high and low limits will be shown in the secondary displays. The meter will compare current values to the high and low limits.
- When the current value is outside these limits, the meter will beep and indicate if it is higher or lower than the set limits.

▲ (Differential) / %

- Pressing the F3 button while the O indicates row M3 toggles between the ▲ (differential) and % functions in comparison to the reference value.
- If no value has been set in the REF function, then the measurement displayed upon entering the ▲ (differential) and % functions will be used as the reference value.
- The reference value is displayed in the upper left display. The actual measurement is displayed in the upper right display, and the differential or percentage of the reference value is displayed in the main display.

REF (Reference)

- Pressing the F4 button while the O indicates row M3 activates the REF function.
- The reference value may be set using the +, -, ◀ and ▶ buttons to set the values in the main display.

REF (Reference) continued

- Press the ◀ and ▶ buttons to move left and right through the reference value to select the appropriate digit to be changed.
- The + and – buttons will increase or decrease the value of the blinking digit.
- The actual measurement will be displayed in the upper right display while in the REF function.
- Pressing the F4 button until the will save the reference value and exit the REF function.

Setup

- Pressing F1 while the O indicates row F4 enters and exits the setup mode.
- The parameters within the setup menu are:
 - 1 bEEP – Turns the beeper on or off
 - 2 A.P.O. – Sets the time for auto power off (in minutes)
 - 3 b.LitE – Sets the time for auto back light off (in minutes)
 - 4 HAZ – Set hazard detect function on or off
 - 5 L.FrEq – Set power line frequency to 50 or 60Hz
 - 6 LoAd – Set the dBm load in the dBm mode
 - 7 rESet – Resets all setup parameters except power line frequency setting back to factory default settings
- Press the ◀ and ▶ buttons to move left and right through the parameters of the setup menu.
- The + and – buttons change the values of the selected setup parameter.
- To exit the setup menu without saving changes to the menu parameters, press the blue button.
- Turning the meter off does not affect changes to the setup menu.

DBm, dB

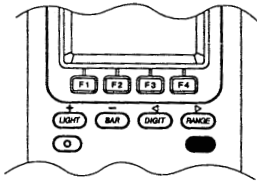
- Press the F3 button while the O indicates row M4 toggles between dBm and dB mode.
- In dB mode, the measurement value is displayed in the upper right display, and the dB value is displayed in the main display.
- In dBm mode, the dBm load is displayed in the upper right display.
- Press and hold the F3 button for 2 seconds to exit dBm/dB mode.

Send

- Press the F4 button while the O indicates row M4 to activate the data acquisition and send data through the optical RS232 connection.
- The **RS232** indicator appears in the display while data is being sent.

Function Buttons

The meter beeps once for every valid key-press.



Light Button

- The light button is used to turn the backlight on or off.
- Disabled in Recall mode.

BAR Button

- The bar button scrolls through the types of bargraph displays.
 - A. Zero at left
 - B. Zero at left, graph zoomed x10, **zoom** displayed
 - C. Bar off
- This button is disabled in Recall mode.

Digit Button

- The digit button toggles between 40000 or 4000 counts.
- The display is updated 2 times per second at 40000 counts and 4 times per second at 4000 counts.

Range Button

- The range button toggles between auto and manual ranging.
- Press the range button for 2 seconds to return to auto range.
- When **Auto** is displayed, the meter is in auto range mode.

O Button

- The O button is used to select a row in the menu function.
- The active row is marked with a O indicator on the left end of the line.

Blue Button

- The blue button toggles between the black or blue functions on the rotary function switch.

Overload Protection

Function	Overload Protection
VAC & VDC	1000V
AAC & ADC	1A/500V
10A/500V	
Ohms (Ω)	600VAC/600VDC
Diode	600VAC/600VDC
Continuity	600VAC/600VDC

Unit of Measure Multipliers

For your reference, the following symbols are often used to make measurement easier:

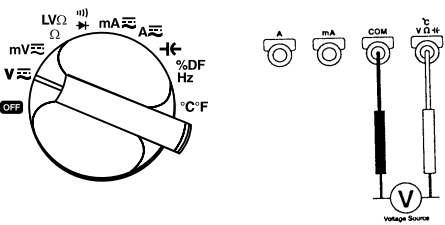
Symbol	Verbal	Multiplier
M	mega	x 1,000,000
k	kilo	x 1,000
m	milli	÷ 1,000
μ	micro	÷ 1,000,000

Voltage Measurements (DC, AC, AC+DC)

DC Voltage Range	Resolution	Accuracy (61-633)	Accuracy (61-635)
40mV	1μV	+(0.2% +8)	+(0.6% +8)
400mV	10μV	+(0.2% +2)	+(0.6% +2)
4V	100μV		
40V	1mV		
400V	10mV		
1000V	100mV		

AC Voltage Range	Frequency Range	Resolution	Accuracy (61-633)	Accuracy (61-635)
400mV	40 ~ 100Hz 100 ~ 1kHz	10μV	±(1.2% +5) ±(2.0% +5)	±(0.7% +5) ±(1.0% +5)
4V	40 ~ 100Hz 100 ~ 1kHz 1k ~ 10kHz 10k ~ 20kHz 20k ~ 50kHz 50k ~ 100kHz	100μV	±(1.0% +5) ±(2.0% +5) ±(3.0% +6) - - -	±(0.7% +5) ±(1.0% +5) ±(2.0% +6) ±(3.0% +7) ±(5.0% +8) ±(10.0% +10)
40V	40 ~ 100Hz 100 ~ 1kHz 1k ~ 10kHz 10k ~ 20kHz 20k ~ 50kHz 50k ~ 100kHz	1mV	±(1.2% +5) ±(2.0% +5) ±(3.0% +6) - - -	±(0.7% +5) ±(1.0% +5) ±(2.0% +6) ±(3.0% +7) ±(5.0% +8) ±(10.0% +10)
400V	40 ~ 100Hz 100 ~ 1kHz 1k ~ 10kHz 10k ~ 20kHz 20k ~ 50kHz	10mV	±(1.2% +5) ±(2.0% +5) ±(3.0% +6) - -	±(0.7% +5) ±(1.0% +5) ±(2.0% +6) ±(3.0% +7) ±(5.0% +8)
750V	40 ~ 100Hz 100 ~ 1kHz	10mV	±(1.2% +5) ±(2.0% +5)	±(0.7% +5) ±(1.0% +5)

dBm (typical): -15dBm ~ 55dBm (0dBm = 1mW into 600Ω)
dBm (typical): -80dBV ~ 50dBV = 1VRMS
Input Impedance: 10MΩ, <100pF
Overload Protection: 1000VDC, 750VRMS
AC Conversion Type: AC Coupled, True RMS responding
AC+DC Volts: Same as ACVRMS +1.00% + 8 digits
Crest Factor: +1.5% addition error for C.F. from 1.4 ~ 3
+3.0% addition error for C.F. from 3 ~ 4



To Measure Voltage:

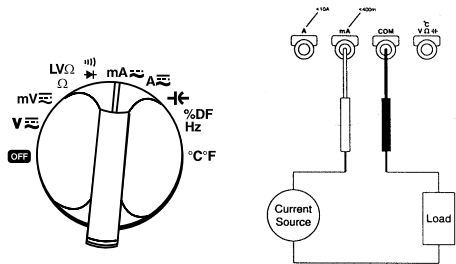
1. Plug the Black test lead into the COM port and the Red test lead into the VΩ port.
2. Set the rotary switch to either the V or mV position.
3. Push the blue button to choose between DC, AC, or AC+DC measurements.
4. Connect the meter in parallel with the load or circuit.
5. Measure the voltage
6. The AC and AC+DC measurements provide a True RMS measurement.
7. For AC Measurements, the frequency and period of the measured signal are displayed on the secondary displays.

Current Measurements (DC, AC, AC+DC)

DC Current Range	Resolution	Accuracy (61-633)	Accuracy (61-635)
40mA	1uA	±(0.5% +4)	±(0.2% +4)
400mA	10uA		
4A	100uA		
10A	1mA		

AC Current	Resolution	Accuracy (61-633)	Accuracy (61-635)
40mA	1uA	±(1.2% +4)	±(0.8% +8)
400mA	10uA		
4A	100uA		
10A	1mA		

- Voltage Burden: 800mV max. for mA input; 1V max. for A input.
- Input Protection: Equipped with high energy fuse.
1A, 600V, IR 10kV fuse for mA input
15A, 600V, IR 100kV fuse for A input.
- AC Conversion Type: AC Coupled, True RMS responding
- AC+DC Volts: Same as ACVRMS +1.00% + 8 digits
- Crest Factor: +1.5% addition error for C.F. from 1.4 ~ 3
+3.0% addition error for C.F. from 3 ~ 4



To Measure Current:

1. Plug the Black test lead into the COM port and the Red test lead into the mA or A port.
2. Set the rotary switch to either the mA or A position.
3. Push the blue button to choose between DC, AC, or AC+DC measurements.
4. Connect the meter in series with the load or circuit.
5. Measure the current.
6. The AC and AC+DC measurements provide a True RMS measurement.
7. For AC Measurements, the frequency and period of the measured signal are displayed on the secondary displays.



Warning

Limit large current measurements (10~20A to 30 seconds, and **allow two minutes of cooling between readings.** Do not connect to circuits with >600V.

Resistance and Low Voltage Resistance Measurements (Ohms)

Resistance Range	Resolution	Accuracy (61-633)	Accuracy 61-635)
400Ω	10mΩ	±(0.5% +2)	±(0.3% +2)
4kΩ	100mΩ		
40kΩ	1Ω		
400kΩ	10Ω	±(0.5% +4)	±(0.3% +4)
4MΩ	100Ω		
40MΩ	1kΩ		

Low Voltage Resistance Range	Resolution	Accuracy (61-633)	Accuracy 61-635)
4kΩ	100mΩ	±(1.0% +2)	±(0.6% +2)
40kΩ	1Ω		
400kΩ	10Ω		
4MΩ	100Ω	±(1.0% +4)	±(0.6% +4)
40MΩ	1kΩ		

- Open circuit voltage: 3.3V
- Open circuit low voltage: 0.6V
- Input protection: 600V rms



To Measure Resistance:

1. Turn the power off to the circuit or device that is to be measured and discharge all capacitors before attempting a measurement.
 2. Plug the Black test lead into the COM port and the Red test lead into the VΩ port.
 3. Set the rotary switch to the "Ω & LVΩ Symbols" position.
 4. Press the blue button to choose between Ω and LVΩ.
- LV setting reduces the maximum test voltage level to about 0.5V to avoid turning on semiconductor devices.

Frequency and Duty Factor Measurements

Frequency Range	Resolution	Accuracy (61-633)	Accuracy (61-635)
400Hz	0.01Hz	±(0.01% +1)	±(0.01% +1)
4kHz	0.1Hz		
40kHz	1Hz		
400kHz	10Hz		
4MHz	100Hz		
Duty Factor	Resolution	Accuracy (61-633)	Accuracy (61-635)
20% ~ 80%	0.1%	+6 digits	+6 digits

Sensitivity: 0.5Vp-p for 15Hz ~ 1MHz
1Vp-p for 1 MHz ~ 4MHz

Min. frequency: 15Hz

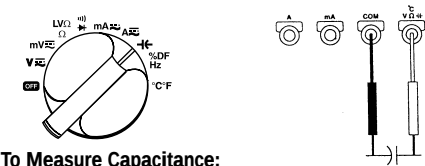
Input protection: 600V rms

To Measure Frequency:

1. Plug the black test lead into the COM port and the red test lead into the VΩ port.
 2. Set the rotary switch to the Hz %DF position.
 3. For duty factor, push the blue button until % is shown on the main display, and Hz is shown in the upper right secondary display.
 4. Connect the meter in parallel with the load or circuit.
 5. Measure frequency or duty factor.
- Duty factor is the percentage of the signal that is high
 - The period is displayed in frequency mode
 - The period and frequency are displayed in frequency mode

Capacitance Measurements

Range	Resolution	Accuracy (61-633)	Accuracy (61-635)
4nF	1pF	±(1.9% +20)	±(0.9% +20)
40nF	10pF		
400nF	100pF		
4μF	1nF		
40μF	10nF	±(2.9% +20)	±(1.9% +20)
400μF	100nF		
4mF	1μF	±(3.9% +20)	±(2.9% +20)
10mF	10μF		

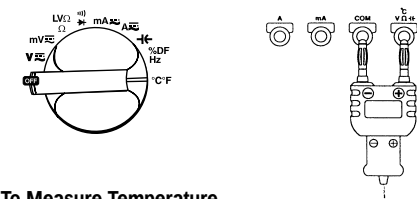


To Measure Capacitance:

1. Turn the power off to the circuit or device that is to be measured and discharge all capacitors before attempting a measurement.
2. Plug the Black test lead into the COM port and the Red test lead into the VΩ port.
3. Set the rotary switch to the μ position.

Temperature Measurements

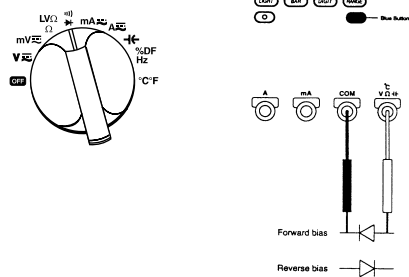
Temperature Range	Resolution	Accuracy (61-633)	Accuracy (61-635)
-200°C ~ -100°C	0.1°C	N/A	3°C + 1 digit
-100°C ~ -50°C			2°C + 1 digit
-50°C ~ 1200°C			1°C + 1 digit



To Measure Temperature

1. Plug the temperature probe and adapter into the COM the V port.
 2. Set the rotary switch to the °C °F position.
 3. For correct reading, ensure that the device being tested contains no voltage.
 4. Press the blue button to chose between a °C or °F display.
- The room temperature is displayed n the right secondary block
 - Multiply the accuracy by 2 for °F
 - Input protection: 600V RMS

Diode Testing



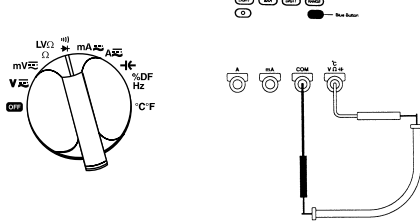
Diode Check:

To ensure a proper functioning diode, the meter will develop a voltage across the component from a test current. The diode test function allows measurements of forward voltage drops across diode and transistor junctions.

1. Turn off power to the device or circuit that is being tested and discharge all capacitors.
2. Plug the Black test lead into the COM port and the Red test lead into the VΩ port.
3. Set the rotary switch to the position.
4. Press the blue button until is shown on the display
5. Connect the test leads to the diode.

Forward bias:	Good = 0.4 to 0.9V Bad = 0 or $\geq 2.0V$
Reverse bias:	Good = OL Bad = $<2.0V$
Test current:	1.1mA (typical)
Open circuit voltage:	3.3VDC (max)
Input Protection:	600V rms

Continuity Check



To Verify Continuity:

A continuity test ensures that all circuit connections are intact.

1. Plug the Black test lead into the COM port and the Red test lead into the VΩ port.
2. Set the rotary switch to the position.
3. Press the blue button until Ω is shown in the display.
4. Connect the test leads to the circuit to be measured. The buzzer will sound if the resistance of the circuit measured is lower than 50Ω .

Continuity threshold:	Approx. 50Ω
Continuity Indicator:	2kHz tone buzzer
Input protection:	600V rms

General Specifications

Stated accuracies are at 23oC ±5oC at less than 80% RH and without battery indicator displayed.

Features	61-633	61-635
LCD Backlight	•	•
Adjustable Auto Backlight Off	•	•
RS-232 Phototronic Serial Port	•	•
RS-232 Cable	Option	•
DMM300 Software	Option	•
Holster and Stand	•	•
Safety	IEC,UL, CSA	IEC,UL CSA
CE Mark	•	•

Physical Characteristics

Dimensions: 200mm x 90mm x 42mm
212mm x 100mm x 55mm (w/holster)
Weight (w/battery): 420g
Weight (w/holster): 650g

Environmental Characteristics

Temperature Operating: 0 to +50°C
Non-Operating (storage): -20 to +60°C
Humidity (Operating): <80%
Altitude (Operating): 2,222m (7290 ft.)
Altitude (Non-Operating): 12,300m (40354 ft.)
Vibration & Shock (Operating): MIL-T-28800E Type II Class 5
2.66g RMS, 5 to 500 Hz,
3 axes, (10 min. each)
Vibration & Shock (Non-Operating) 3.48G RMS, 50 to 500 Hz, 3
axes, (10 min. each)
Dust/Water Protection IP Rating: IP 64

Certifications & Compliances

Safety: Designed to IEC 1010-1, UL3111 and CSA Specifications
Input Rating: 1000VDC Category II
600VDC Category III
750VAC Category II
600VAC Category III
Cat III: Distribution level mains, fixed installations
Cat II: Local level mains, appliances, portable equipment
Overvoltage Category: Cat I: Signal level, special equipment or parts of equipment, telecommunica-
tion, electronics
Pollution Degree 2: Do not operate in environments where conductive pollutants may be present.



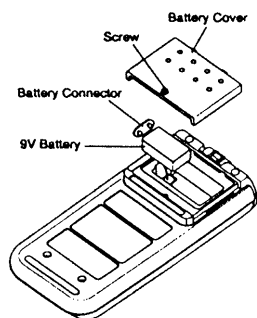
Maintenance

Warning
To avoid electrical shock, remove test lead before opening the cover. Repairs or servicing not covered in this manual should only be performed by qualified personnel.

Battery Installation or Replacement:

The #61-633 and #61-635 are powered by one 9 volt battery.

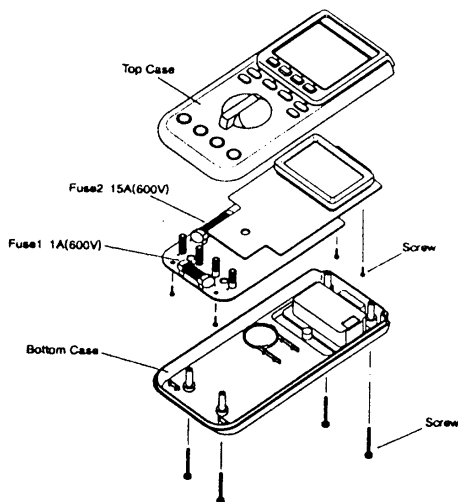
1. Remove the test leads from the front terminals and turn the meter off.
2. Remove the screw from the battery cover and lift to remove.
3. Replace batteries.
4. Make sure the battery box leads do not become pinched between the case and battery cover before replacing the battery cover and screw.



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Fuse Replacement

1. Remove the test leads from the front terminals and turn the meter off.
2. Remove the screw from the battery cover and lift to remove.
3. Remove the battery.
4. Remove the four screws installed between the top and bottom case.
5. Remove the 4 screws installed between the PCB and top case of the meter, and lift the top case from the PCB.
6. Remove the defective fuse by gently prying one end of the fuse loose and sliding the fuse out of the fuse holder.
7. Install a new fuse of the same size and rating. Make sure it is centered in the fuse holder.
8. Re-assemble the PCB, top and bottom case.
9. Re-install the battery and re-assemble the battery cover.



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Lifetime Limited Warranty

This meter is warranted to the original purchaser against defects in material or workmanship for the lifetime of the meter. During this warranty period, IDEAL INDUSTRIES, INC. will, at its option, replace or repair the defective unit, subject to verification of the defect or malfunction.

This warranty does not apply to defects resulting from abuse, neglect, accident, unauthorized repair, alteration, or unreasonable use of the instrument.

Any implied warranties arising out of the sale of an IDEAL product, including but not limited to implied warranties of merchantability and fitness for a particular purpose, are limited to the above. The manufacturer shall not be liable for loss of use of the instrument or other incidental or consequential damages, expenses, or economic loss, or for any claim or claims for such damage, expenses or economic loss.

State laws vary, so the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

IDEAL INDUSTRIES, INC.

Sycamore, IL 60178, U.S.A.

800-304-3578 Customer Assistance

www.testersandmeters.com

ND 2352-1

Made in Taiwan