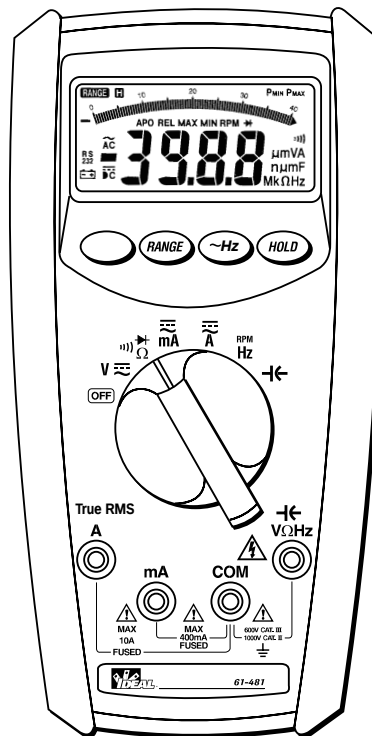




#61-481

480 Platinum Pro Series Commercial Contractor Grade Multimeter



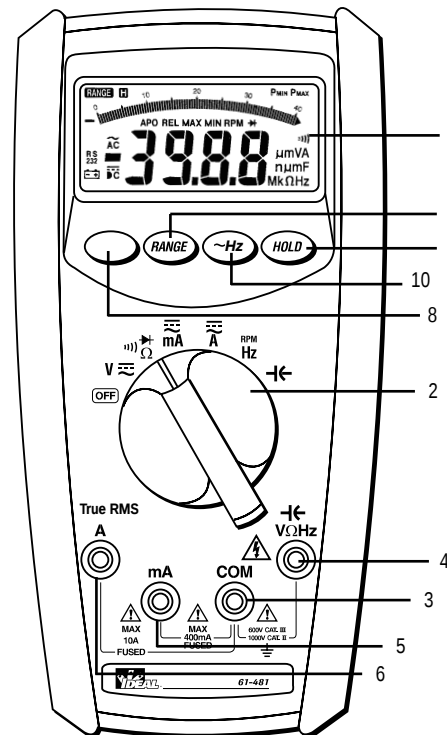
Symbols in this Manual

⚠ This symbol indicates where cautionary or other information is found in the manual.

— Fuse

🔋 Battery

Refer to Figure 1 and to the following numbered steps to familiarize yourself with the meter's front panel controls and connectors.



1. **Digital Display** – The digital display has 4000 counts LCD readout with 82 segments analog bar graph, auto polarity, decimal point, “” AC, DC “”  RANGE,  APO and unit annunciators.
2. **Rotary Switch** – Select the Function and Range desired.
3. **COM Input Terminal** – Ground input connector.
4. **VΩHz Input Terminal** – Positive input connector for Volts, Ohms and Frequency.
5. **mA Input Terminal** – Positive input connector for Amp measurements (up to 400mA).
6. **A Input Terminal** – Positive input connector for Amp measurements (up to 10A).
7. **Range Switch, (Manual Range)** – “Range” switch is pushed to select manual ranging and to change ranges. When “Range” switch is pushed on “Range” annunciator on the LCD appears. Push “” switch to select appropriate range to be used. Push “Range” switch and hold 2 seconds to return to Autoranging.
8. **Blue Switch** – Push the switch to measure AC Voltage / Current or DC Voltage / Current in the Voltage / Current mode or to measure Resistance or continuity or diode in Ω / “” /  mode or to measure frequency or RPM in Hz/RPM mode.
9. **Hold Switch** – This switch is used to hold measured value for all functions, and then  annunciator is displayed. Conversions are made but the display is not updated. This switch could be invoked to “MIN/MAX” mode or “PMIN/PMAX” mode.
10. **~Hz Switch** – This switch is used to quickly view the frequency during measuring the AC voltage or current. Push “~ Hz” switch once the LCD is changed to display frequency. Push “~Hz” switch again, the LCD back to display the AC signal amplitude reading. In “~ Hz” mode, pressing RANGE key switch does not change the frequency range. However, RANGE key switch changes the sensitivity of frequency detection, if the input signal amplitude is less than 1% of full scale reading, the user shall increase the sensitivity. Pressing Range switch in “~ Hz” mode also changes the full scale range of the original voltage or current mode.

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.

Overload Protection

Function	Overload Protection
VAC & VDC	1000V
AAC & ADC	1A/500V 16A/500V
Ohms (Ω)	600VAC/600VDC
Diode	600VAC/600VDC
Continuity	600VAC/600VDC

Unit of Measure Multipliers

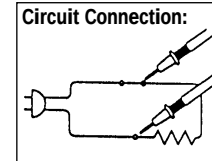
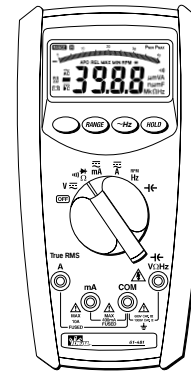
For your reference, the following symbols are often used to make measurement easier:

Symbol	Verbal	Multiplier
M	mega	$\times 1,000,000$
k	kilo	$\times 1,000$
m	milli	$\div 1,000$
μ	micro	$\div 1,000,000$

Auto Power Off (APO)

The APO sign on the LCD panel indicates the meter is working in the Auto Power Off mode. If the meter idles for more than 30 minutes, the meter automatically turns the power off. When this happens, the state (non-logic measurement) of the meter is saved, the meter can be turned back on by pushing any key switch or changing the rotary switch. The meter will give an alarm 15 seconds before the meter automatically turns the power off. To disable the auto power off function, power up the meter while pressing either the range or $\sim$ Hz switch.

True RMS AC Volt



Range	Resolution	Max Display	Accuracy
400mV	0.1mV	400.0	$\pm(2.0\% +10)$ 40Hz to 60Hz
4V	1mV	4.000	$\pm(1.3\% +5)$ 40Hz to 500kHz
40V	10mV	40.00	$\pm(1.3\% +5)$
400V	100mV	400.0	40Hz to 1kHz
750V	1V	750	

AC Conversion Type: AC conversions are ac-coupled, true rms responding, calibrated to the rms value Sine wave input.

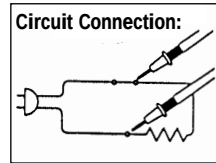
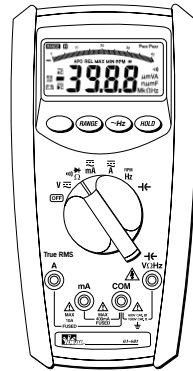
Input and Impedance: 10M Ω less than 100 PF.

Crest Factor: +1.5% additional error for C.F. from 1.4 to 3
+3.0% additional error for C.F. from 3 to 4

To Measure True RMS AC Voltage:

1. Plug the black test lead into the COM port and the red test lead into the V Ω H port.
2. Set the rotary switch to the V~ position.
3. Push the blue button until AC is shown on the display.
4. Connect the meter in parallel with the load or circuit.
5. Measure AC Voltage.

DC Volts



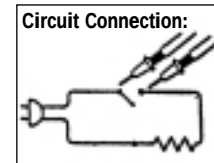
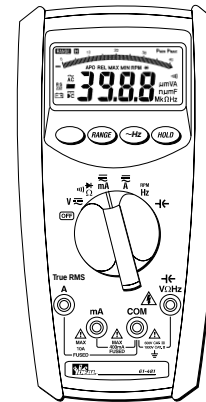
Range	Resolution	Max Display	Accuracy
400mV	100 μ V	400.0	$\pm(0.25\% + 5)$
4V	1mV	4.000	$\pm(0.4\% + 1)$
40V	10mV	40.00	$\pm(0.25\% + 1)$
400V	100mV	400.0	
1000V	1V	1000	

Input Impedance: 10M Ω (over 1000M Ω in 400mV range)

To Measure DC Voltage:

1. Plug the black test lead into the COM port and the red test lead into the V Ω Hz port.
2. Set the rotary switch to the V position.
3. Push the blue button until DC is shown on the display.
4. Connect the meter in parallel with the load or circuit.
5. Measure DC Voltage.

True RMS AC Current



Range	Resolution	Max Display	Accuracy	Voltage Burden
40mA	10 μ A	40.00	$\pm(2.0\% + 5)$	200mV max
400mA	0.1mA	400.0		2Vmax
10A	10mA	10.00	$\pm(2.5\% + 5)$	2V max

AC Conversion Type: AC conversions are ac-coupled, true rms responding, calibrated to the rms value Sine wave input.

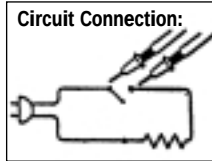
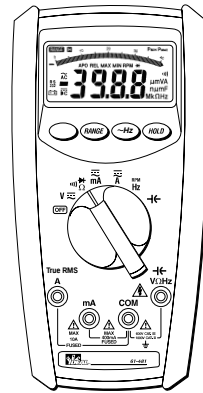
Overload Protection: 1A (500V) fast blow fuse for mA input
16A (500V) fast blow fuse for A input

Crest Factor: +1.5% additional error for C.F. from 1.4 to 3
+3.0% additional error for C.F. from 3 to 4

To Measure True RMS AC 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 the mA or A position.
3. Push the blue button until AC is shown on the display.
4. Connect the meter in series with the load or circuit.
5. Measure AC Current.

DC Current



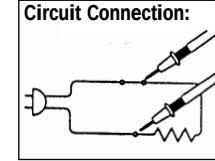
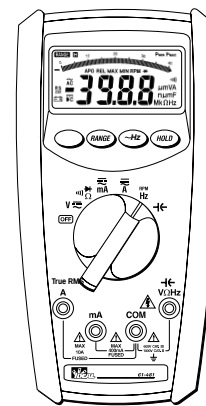
Range	Resolution	Max Display	Accuracy	Voltage Burden
40mA	10 μ A	40.00	$\pm(0.6\% + 2)$	200mVmax
400mA	0.1mA	400.0	$\pm(0.7\% + 2)$	2Vmax
10A	10mA	10.00	$\pm(1.0\% + 2)$	2V max

Overload Protection: 1A (500V) fast blow fuse for $\sim$ A input
16A (500V) fast blow fuse for A input

To Measure DC 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 the mA or A position.
3. Push the blue button until $\overline{DC}$ is shown on the display.
4. Connect the meter in series with the load or circuit.
5. Measure DC Current.

Frequency/RPM



Range	Resolution	Sensitivity	Accuracy
4.0KHz/40KRPM	1Hz/300RPM	100mV rms*	Frequency: 0.01% ± 1 digit
40KHz/400KRPM	10Hz/300RPM		
400KHz/4MRPM	100Hz/3KRPM	250mV rms	RPM: 0.01% ± 10 digits
4MHz/40MRPM	1KHz/30KRPM		
40MHz/400MRPM	10KHz/300KRPM	IV rms	

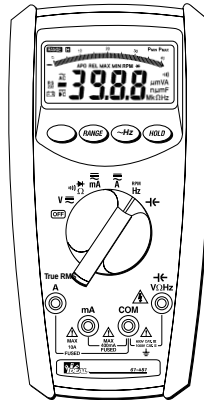
To Measure Frequency:

1. Plug the black test lead into the COM port and the red test lead into the V Ω Hz port.
2. Set the rotary switch to the Hz RPM position.
3. For RPM, Push the blue button until RPM is shown on the display.
4. Connect the meter in parallel with the load or circuit.
5. Measure Frequency or RPM.

Overload Protection: 600V rms

*Less than 50Hz the sensitivity is 1.5V.

Frequency with $\sim$ Hz Switch



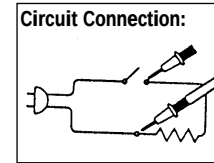
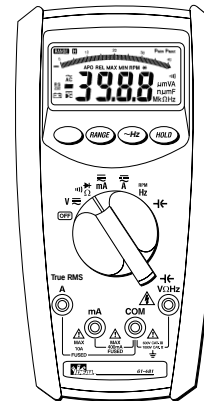
Function	Range	Sensitivity	Accuracy
AC Voltage	400mV	40mV rms	0.01% reading +5 digits
	4V	0.2V rms	
	40V	2V rms	
	400V	20V rms	
	750V	200V rms	
AC Current	40mA	8mA rms	
	400mA	80mA rms	
	10A	8A rms	

To Measure Frequency with the $\sim$ Hz Switch

This switch is used to quickly view frequency during a measurement of AC voltage or current.

1. Push $\sim$ Hz during an AC voltage or current measurement.
2. The LCD will display the frequency measurement of the circuit.
3. Push $\sim$ Hz again to return to the AC voltage or current measurement.

Resistance (Ohms)



Range	Resolution	MaxDisplay	Accuracy
400 Ω	0.1 Ω	400.0	$\pm(0.7\% + 3)$
4k Ω	1 Ω	4.000	
40k Ω	10 Ω	40.00	
400k Ω	100 Ω	400.0	$\pm(0.6\% + 3)$
4M Ω	1k Ω	4.000	
40M Ω	10k Ω	40.00	

Open Circuit Voltage: -1.3V approx.

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 V Ω Hz port.
3. Set the rotary switch to the Ω position.
4. For correct reading, ensure that the device being tested contains no voltage.
5. Press the range button to select the proper range of the meter.
6. Measure resistance.

Range Guide for Ohms (Ω):

300 = Meter indicates actual resistance

3k = Multiply meter display reading by 1,000 to acquire actual resistance.

30k = Multiply meter display reading by 1,000 to acquire actual resistance.

300k = Multiply meter display reading by 1,000 to acquire actual resistance.

3M = Multiply meter display reading by 1,000,000 to acquire actual resistance

300M = Multiply meter display reading by 1,000,000 to acquire actual resistance.

The meter displays total resistance through all possible paths between the probe-tips. These multiple paths may result in measurements that do not correspond to the ohm value indicated by the resistor color code.

Determining Resistor Values:

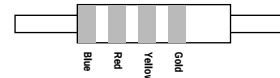
To determine the value of a resistor, use the color bands on the



resistor and the table on the following page.

Resistor Color Code Table

Color	1st Digit	2nd Digit	Multiplier	Tolerance (Percentage)
Black	0	0	1	
Brown	1	1	10	
Red	2	2	100	
Orange	3	3	1,000	
Yellow	4	4	10,000	
Green	5	5	100,000	
Blue	6	6	1,000,000	
Violet	7	7	10,000,000	
Gray	8	8	100,000,000	
White	9	9	1,000,000,000	
Gold				+/- 5%
Silver				+/- 10%
No Color				+/- 20%

Example:

1st color band is blue so the first digit is a 6

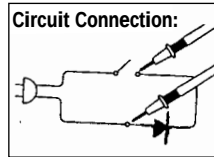
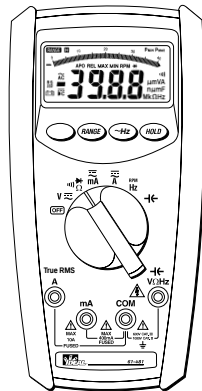
2nd color band is red so the second digit is a 2

3rd color band is yellow so multiply 62 x 10,000

4th color band is gold so the tolerance is $\pm 5\%$

Your Resistor value is 620,000 Ohms ($620k\Omega$) with a tolerance of $\pm 5\%$.

Diode Testing



Function	Resolution	Accuracy	Max. Test Current	Max. Open Circuit Voltage
✱	1mV	+(1.5% +5)*	1.5mA	3V

* For 0.4V to 0.8V.

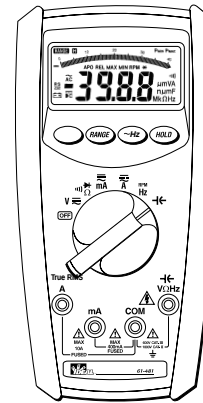
Overload Protection: 600V rms max

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 VΩHz port.
3. Set the rotary switch to the Ω $\rightarrow$ $\rightarrow$ $\rightarrow$ $\rightarrow$ position.
4. Press the blue button until ✱ is shown on the display
5. Connect the test leads to the diode. Normally the forward voltage drop of a good silicone diode is shown between 400V and 90V. If the diode under test is defective, "000" (short circuit) or "OL" (non-conductive) is displayed.

Capacitance



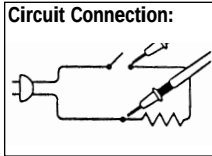
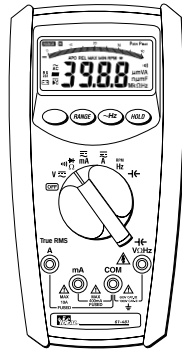
Range	Resolution	Max Display	Accuracy
4nF	1pF	4.000	±(3.% reading +10 digits)
40nF	10pF	40.00	
400nF	100pF	400.0	
4μF	1nF	4.000	±(2% reading +8 digits)
40μF	10nF	40.00	
400μF	100nF	400.0	
4mF	1μF	4.000	±(5% reading +20 digits)
40mF	10μF	40.00	

Overload Protection: 600V rms

To Measure Capacitance:

1. Plug the black test lead into the COM port and the red test lead into the VΩHz port.
2. Set the rotary switch to the $\rightarrow$ $\rightarrow$ $\rightarrow$ $\rightarrow$ position.
3. Connect the test leads to the circuit to be measured.
4. Measure capacitance.

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 V Ω Hz port.
2. Set the rotary switch to the Ω with a diode symbol position.
3. Press the blue button until $\bullet \rightarrow$ 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 30 Ω .

Accessories

For AC Current Clamp (61-450):

1. Plug the black test lead into the COM port and the red test lead into the V Ω Hz port.
2. Remove the probe tips from the end of the leads.
3. Attach the leads to the current clamp. (polarity will not effect reading)
4. Set the rotary switch to the V position.
5. Push the blue button until AC is shown on the display.
6. Snap the jaw of the current clamp around one of the current carrying conductors.

General Specifications

LCD Display:	4000 count maximum reading
Bar Graph Display:	82 segment analog bar graph
Polarity Indication:	Automatic, negative indicated, positive implied
Overrange Indication:	"OL" or "-OL"
Low Battery Indication:	"  " when the battery voltage drops below operating voltage
Size (WxHxD):	88mm x 180mm x 33.5mm (without holster) 94mm x 188mm x 40mm (with holster)
Sampling:	2 times/sec LCD Display, 12 times/sec bar graph
Auto Power Off:	Approx. 30 min.
Operating Temperature:	0°C ~ 30°C (<80% RH), 30°C ~ 40°C (<75% RH), 40°C ~ 50°C (<45% RH)
Storage Temperature:	-20°C ~ 60°C (0~80% RH) when battery removed from meter
Temperature Coefficient:	0.15 x (specified accuracy) / °C, <18°C or >28°C
Power Requirements:	9V NEDA 1604, 1EC bf 22, J1S 006P
Battery Life:	300 hours (alkaline)
Installation Category:	IEC 1010, 1000V Cat. II, 600V Cat III

Environmental Conditions

Indoor Use

Maximum Altitude:	2000 Meter
Installation Category:	IEC 1010, 1000V Cat. II, 600V Cat. III
Pollution Degree:	2



Maintenance

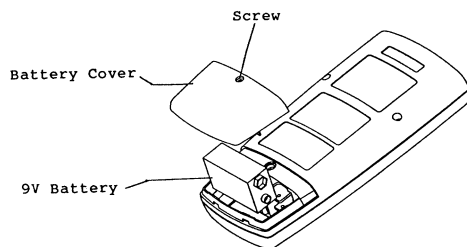
Warning

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:

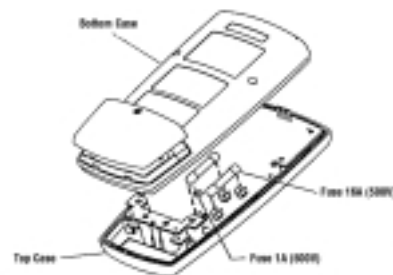
The #61-480 is powered by one 9V battery.

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. Lift battery box and 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.



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 screws from the bottom case and the inside of the battery cover and lift the case bottom until it unsnaps from the case top.
4. Remove the defective fuse by gently prying one end of the fuse loose and sliding the fuse out of the fuse holder.
5. Install a new fuse of the same size and rating. Make sure it is centered in the fuse holder.
6. Make sure the battery box leads do not become pinched between the case and battery cover before replacing the bottom case and battery cover.



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 2365-1

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