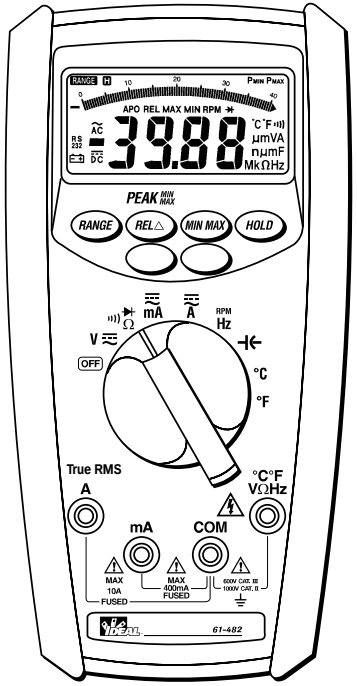
#61-482

480 Platinum Pro Series

Commercial Contractor Grade Multimeter



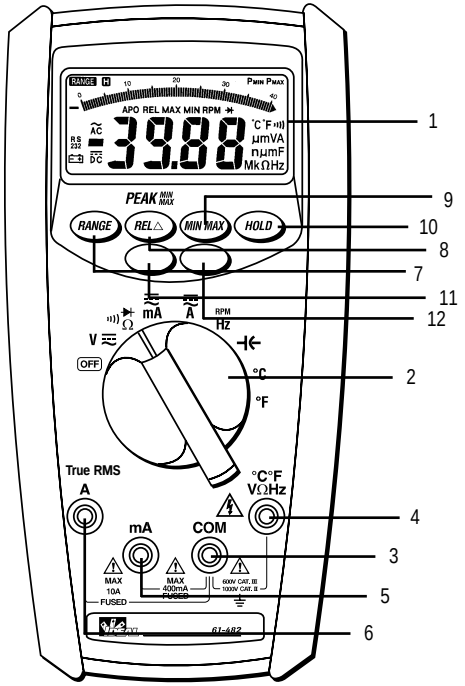
Symbols in this Manual

⚠ 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 •ıı) ⊣ RANGE, H APO and unit annunciators.
2. **Rotary Switch –** Select the Function and Range desired.
3. **COM Input Terminal –** Ground input connector.
4. **°C °F VΩHz Input Terminal –** Positive input connector for Volts, Ohms Frequency, and Temperature.
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 "Range" switch to select appropriate range to be used. Push "Range" switch and hold 2 seconds to return to Autoranging.
8. **REL △(PEAK MIN/MAX) Switch –** For resistance, frequency, capacitance and temperature measurements, this button enables the relative change function. When pressed the value is stored, and all new measurements are displayed as their relative difference from the stored value. In current and voltage measurements, this button performs a peak hold finction. The peak hold mode must be calibrated prior to use. To calibrate the peak hold, press the key until the meter displays "CAL". Short the test leads to calibrate.
9. **MIN/MAX Switch –** Press this switch to toggle between the minimum and maximum values. Pressing the button for 2 seconds to escape MIN/MAX mode.
10. **Hold Switch –** This switch is used to hold the measured value for all functions. The held value is displayed along with the H annunciator. Measurements are made ,but the display is not updated. This function can be used in MIN/MAX mode or PEAK MIN/MAX mode.
11. **Light Switch –** This switch turns the backlight on and off.
12. **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/ •ıı)/⊣ mode, or to measure frequency or RPM in Hz/RPM 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

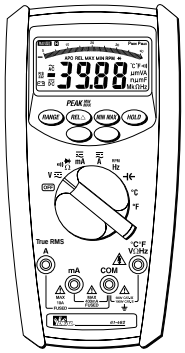
For your reference, the following symbols are often used to make measurement easier:

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

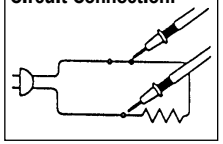
Auto Power Off (APO)

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 in 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, REL △ or min/max switch.

True RMS AC Volt



Circuit Connection:



Range	Resolution	Max Display	Accuracy
400mV	0.1mV	400.0	±(2.0% +8) 40Hz to 60Hz
4V	1mV	4.000	±(1.3% +5) 40Hz to 1kHz
40V	10mV	40.00	±(1.3% +5) 40Hz to 1kHz
400V	100mV	400.0	
750V	1V	750	

AC Conversion Type: AC conversions are AC-coupled, true RMS responding, calibrated to the RMS value sine wave input.

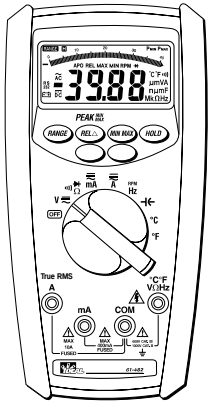
Input and Impedance: 10MΩ less than 100 PF.

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

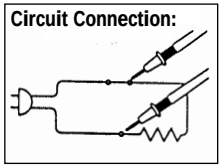
To Measure True RMS AC Voltage:

1. Plug the black test lead into the COM port and the red test lead into the °C°F VΩHz port.
2. Set the rotary switch to the V position.
3. Push the blue button until $\tilde{A}C$ is shown on the display.
4. Connect the meter in parallel with the load or circuit.
5. Measure AC Voltage.

DC Volts



Circuit Connection:



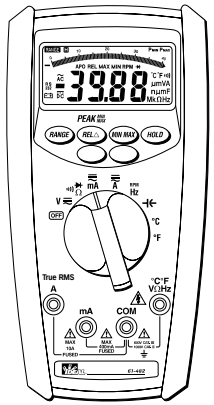
Range	Resolution	Max Display	Accuracy
400mV	100µV	400.0	±(0.25% +5)
4V	1mV	4.000	±(0.4% +1)
40V	10mV	40.00	±(0.25% +1)
400V	100mV	400.0	
1000V	1V	1000	

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

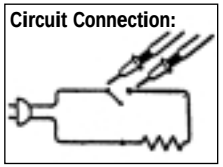
To Measure DC Voltage:

1. Plug the black test lead into the COM port and the red test lead into the °C°F VΩHz 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



Circuit Connection:



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

AC Conversion Type: AC conversions are AC-coupled, true RMS responding, calibrated to the RMS value sine wave input.

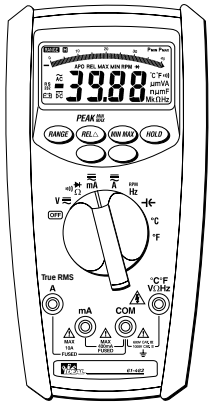
Overload Protection: 1A (500V) fast blow fuse for mA input
16A (500V) fast blow fuse for A input

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

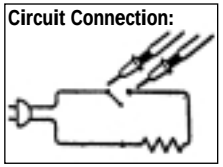
To Measure True RMS AC Current:

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



Circuit Connection:



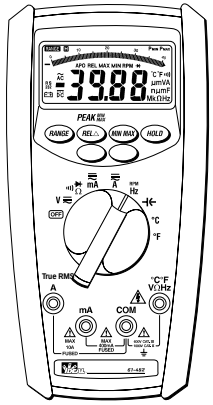
Range	Resolution	Max Display	Accuracy	Voltage Burden
40mA	10µA	40.00	±(0.6% +2)	200mVmax
400mA	0.1mA	400.0	±(0.7% +2)	2Vmax
10A	10mA	10.00	±(1.0% +3)	2V max

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

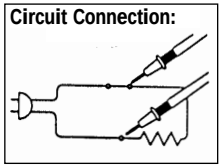
To Measure DC Current:

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 DC is shown on the display.
4. Connect the meter in series with the load or circuit.
5. Measure DC Current.

Frequency/RPM



Circuit Connection:



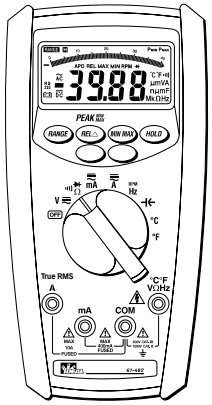
Range	Resolution	Sensitivity	Accuracy
4.0KHz/40KRPM	1Hz/30RPM	100mV rms*	Frequency:
40KHz/400KRPM	10Hz/300RPM		0.01% ±1 digit
400KHz/4MRPM	100Hz/3KRPM		
4MHz/40MRPM	1KHz/30KRPM	250mV rms	RPM:
40MHz/400MRPM	10KHz/300KRPM	IV rms	0.01% ±10 digits

Overload Protection: 600V rms
*Less than 20Hz the sensitivity is 1.5V

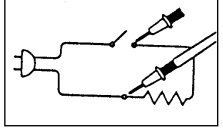
To Measure Frequency:

1. Plug the black test lead into the COM port and the red test lead into the °C°F VΩHz 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.

Resistance (Ohms)



Circuit Connection:



Range	Resolution	MaxDisplay	Accuracy
400Ω	0.1Ω	400.0	±(0.7% +3)
4kΩ	1Ω	4.000	±(0.4% +3)
40kΩ	10Ω	40.00	
400kΩ	100Ω	400.0	
4MΩ	1kΩ	4.000	±(0.6%+3)
40MΩ	10kΩ	40.00	±(1.5% +5)

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 °C°F VΩHz 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.

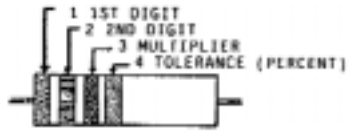
Range Guide for Ohms (Ω):

400 = Meter indicates actual resistance
4k = Multiply meter display reading by 1,000 to acquire actual resistance.
40k = Multiply meter display reading by 1,000 to acquire actual resistance.
400k = Multiply meter display reading by 1,000 to acquire actual resistance.
4M = Multiply meter display reading by 1,000,000 to acquire actual resistance
400M = 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:

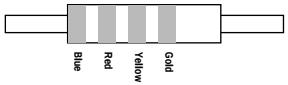
To determine the value of a resistor, use the color bands on the resistor and the table on the following page.



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%

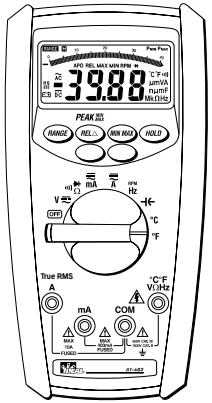
Example:



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 ±5%

Your Resistor value is 620,000 Ohms (620kΩ) with a tolerance of ±5%.

Temperature



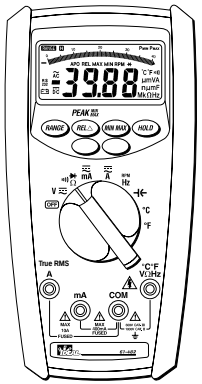
Temperature	Accuracy	Temperature	Accuracy
-4°F ~ 32°F	±(2% + 8°F)	-20°C ~ 0°C	±(2% + 4°C)
33°F ~ 212°F	±(1% + 6°F)	1°C ~ 100°C	±(1% + 3°C)
213°F ~ 932°F	±(2% + 6°F)	101°C ~ 500°C	±(2% + 3°C)
933°F ~ 1472°F	±(3% + 4°F)	501°C ~ 800°C	±(3% + 2°C)

Overload Protection: 600V rms

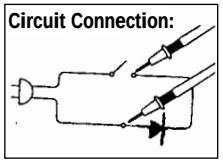
To Measure Temperature:

1. Connect the thermocouple to the temperature adapter with the “+” on the thermocouple lining up with the “+” on the adapter and the “K” on the thermocouple lining up with the “-” on the adapter.
2. Plug the temperature adapter into the 61-492 with the “+” inserted into the port and the “-” inserted into the COM port.
3. Set the rotary switch to either the °F or °C position.
4. Measure temperature.

Diode Testing



Circuit Connection:



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

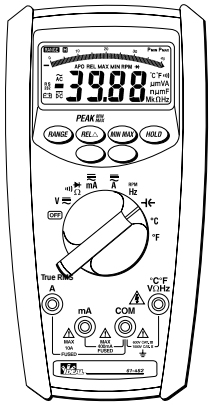
* For 0.4V to 0.8V.

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 °C°F VΩHz port.
3. Set the rotary switch to the Ω •))) ⊣◀ 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



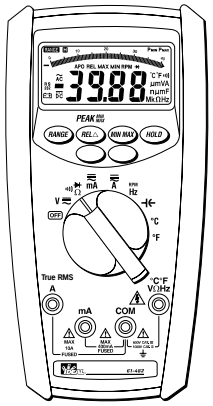
Range	Resolution	Accuracy
4nF	1pF	±(3% + 10 digits)
40nF	10pF	
400nF	100pF	±(2% + 6 digits)
4µF	1nF	
40µF	10nF	
400µF	100nF	
4mF	1µF	±(5% + 20 digits)
40mF	10µF	

Overload Protection: 600V rms

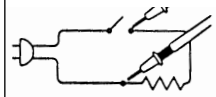
To Measure Capacitance:

1. Plug the black test lead into the COM port and the red test lead into the °C°F VΩHz port.
2. Set the rotary switch to the ⊣◀ position.
3. Connect the test leads to the circuit to be measured.
4. Measure capacitance.

Continuity Check



Circuit Connection:

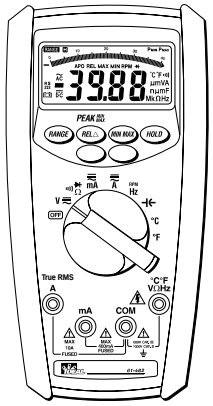


To Verify Continuity:

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 °C°F VΩHz port.
2. Set the rotary switch to the Ω •))) ➧position.
3. Press the blue button until •))) 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 30Ω.

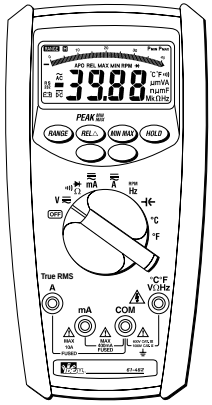
Peak Hold Measurements



Function	Range	Accuracy	Function	Range	Accuracy
DC Voltage	400mV	Unspecified	AC Voltage	400mV	Unspecified
	4V	±(1.5% +300)		4V	±(1.5% +300)
	40V	±(1.5% +60)		40V	±(1.5% +60)
	400V			400V	
	1000V			750V	
DC Current	40mA	±(3% +60)	AC Current	40mA	±(3% +60)
	400mA			400mA	
	10A	±(1.5% +60)		10A	±(1.5% +60)

In current and voltage measurements, the REL △button performs a peak hold function. The peak hold mode must be calibrated prior to use. To calibrate the peak hold, press the key until the meter displays “CAL”. Short the test leads to calibrate.

Accessories



For AC Current Clamp (61-450):

1. Plug the black test lead into the COM port and the red test lead into the VΩHz 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 ÃC 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

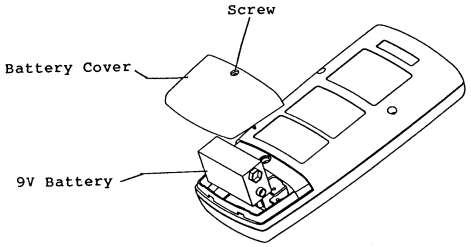
Warning

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:

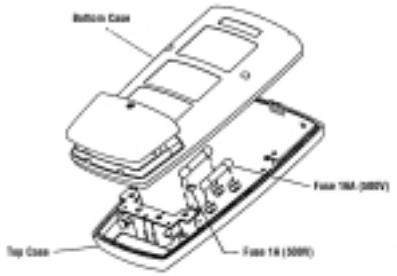
The #61-480 is powered by one 9V battery.

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. Replace battery.
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.

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