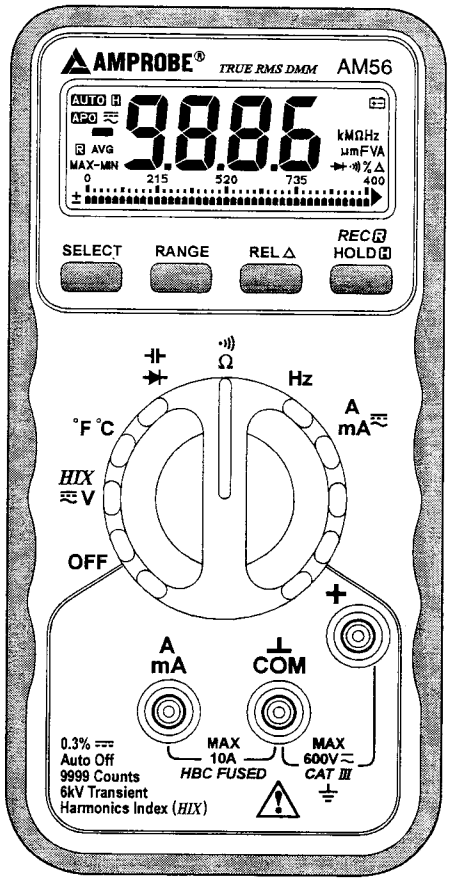
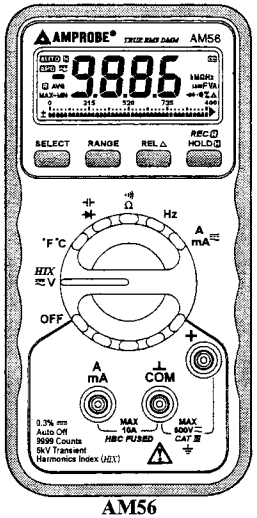


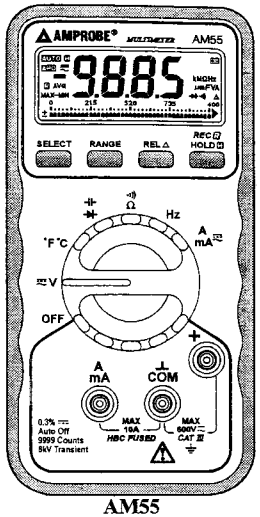
USER'S MANUAL

AM50
AM53
AM55
AM56

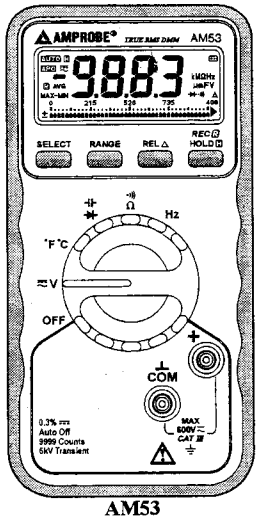
AMPROBE®



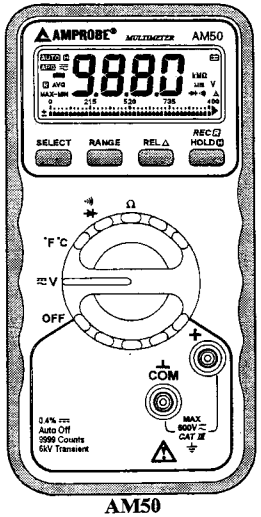
AM56



AM55



AM53



AM50

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PRECAUTIONS FOR PERSONAL AND INSTRUMENT PROTECTION

1) Read these instructions thoroughly and follow them carefully.
2) In many instances, you will be working with dangerous levels of voltage and/or current. Therefore, it is important that you avoid direct contact with any uninsulated, current-carrying surfaces. Appropriate insulating gloves, clothing and eye protection should be worn.
3) To avoid electrical shock to the user and/or damage to the instrument, do not apply more than 1000V between any terminal and ground.
4) Before applying test leads to circuit under test, make certain that leads are plugged into proper jacks and switches are set to proper range and function.
5) Before using any electrical instruments or tester for actual testing, the unit should be checked on a low energy high impedance source. **Do not use power distribution lines or any other high energy sources.**
6) When measuring current using the mA or 10A input: Before connecting or disconnecting the meter to or from the circuit to be tested, turn off all power to the circuit.
7) Do not attempt to measure a voltage unless you are already certain that the voltage is below 600V (AC or DC).
8) If the instrument should indicate that voltage is not present in circuit, do not touch circuit until you have checked to see that all instrument switches are in proper position and instrument has been checked on a known live line.
9) Make certain no voltage is present in circuit before connecting ohmmeter to circuit.

IMPORTANT: Plug in only one accessory probe or set of test leads at any one time, except as directed.
IMPORTANT: Failure to follow these instructions and/or observe the above precautions may result in personal injury and/or damage to the instrument and/or accessories.

I) SAFETY

This indoor use instrument has met the following safety standards, IEC 1010-1 UL3111-1, CSA 22.2-1 and can be used in a Pollution Degree II, Installation Categorv III environment.
This manual contains information and warnings that must be followed for safe and proper operation of the instrument.

TERMS IN THIS MANUAL

WARNING identifies conditions and actions that could result in serious injury or even death to the user.

CAUTION identifies conditions and actions that could cause damage or malfunction in the instrument.

INTERNATIONAL ELECTRICAL SYMBOLS

 Attention ! Refer to the explanation in Manual

 Dangerous Voltage

 Ground

 Double Insulation

 Fuse

 AC — Alternating Current

 DC — Direct Current

 Either DC or AC

Safety: The instruments meet the requirements for double insulation to IEC1010-1(1995), EN 61010-1(1995), UL3111-1(6.1994), CSA C22.2 NO. 1010-1-92 to:

terminal +: Installation category III, 600V ac and dc

terminal mA/A: (AM55 & AM56 ONLY)
Installation category III, 600 Volts ac.
Installation category II, 250 Volts dc.

E.M.C. : The instruments meet EN 55011(3.1991) and EN 50082-1(1992)

WARNING
To avoid electrical shock hazard or damage to the meter, do not exceed the overload level shown in **TABLE 1**

FUNCTION	TERMINALS	OVERLOAD LEVEL
DC VOLTAGE AC VOLTAGE Hz FREQUENCY Ω RESISTANCE •)) AUDIBLE CONTINUITY ⊣⊢ CAPACITANCE →| DIODE TEST	+ & COM	600 VDC or VAC rms
mA A CURRENT	mA A & COM	10A/600V*

* 10A CONTINUOUS; 20A FOR 30 SECONDS MAXIMUM, 5 MINUTES COOL DOWN INTERVAL

TABLE 1

WARNING

To avoid electrical shock hazard, observe the proper safety precautions when working with voltages above 60 VDC or 25 VAC rms. These voltage levels pose a potential shock hazard to the user.

Inspect test leads, connectors, and probes for damaged insulation or exposed metal before using the instrument. If any defects are found, replace them immediately.

To avoid electrical shock hazard, do not touch test lead tips or the circuit being tested while power is applied to the circuit being measured.

Never attempt a voltage measurement with the test lead inserted into the mA A input jack. You might be injured or damage the meter.

CAUTION

Disconnect the test leads from the test points before changing functions. Always set the instrument to the highest range and work downward for an unknown value if you are using manual ranging mode. Always use the correct replacement fuse. Check the manual for proper part number.

II) INTRODUCTION

The Amprobe AM50 Series are hand held, battery operated professional quality digital multimeters designed for today's complex HVAC/R, Electrical and Electronic system diagnostics and troubleshooting.

The Series includes AM50, AM53, AM55 & AM56 to provide different function combinations of DC Voltage, AC Voltage, Harmonics Index™ (HIX), Temperature, Frequency, Resistance, Continuity Test, Capacitance, Diode Test, DC Current as well as AC Current.

The user's manual uses the top of the line model AM56 as a representative for illustration purposes. Please refer to your respective model for function availability for each model.

Pushbutton functions include Data Hold, Auto or Manual Ranging, Relative Zero Mode, Record MAX/MIN/MAX-MIN/AVG as well as Secondary Function selections.

The entire AM50 Series is housed inside a gasket sealed casing which keeps out grease, oil, dirt and moisture to maintain superb accuracy and reliability. Besides, the casing is made of high impact, thick wall fire retardant material to maximize durability of the meter, and safety to the user.

The AM50 Series is yet another breakthrough for handheld instrumentation and please read all Warnings and Safety information prior to use.

III) PRODUCT DESCRIPTION

(A) PANEL ILLUSTRATION, See FIG 1

1. **LCD display** 4 digit 9999 counts LCD display

2. **REC HOLD** Pushbutton. Push momentarily to activate HOLD, or Press and Hold for 1 second to activate RECORD function

3. **REL Δ** Pushbutton to select Relative Zero

4. **Selector** Turn the Power On or Off and Select a function

5. **+** Input Jack for all functions EXCEPT current functions

6. **COM** Common (Ground reference) Input Jack for all functions

7. **mA A** Input Jack for current function (AM55 & AM56 only)

8. **RANGE** Pushbutton to select Auto/Manual ranging

9. **SELECT** Pushbutton to select secondary functions

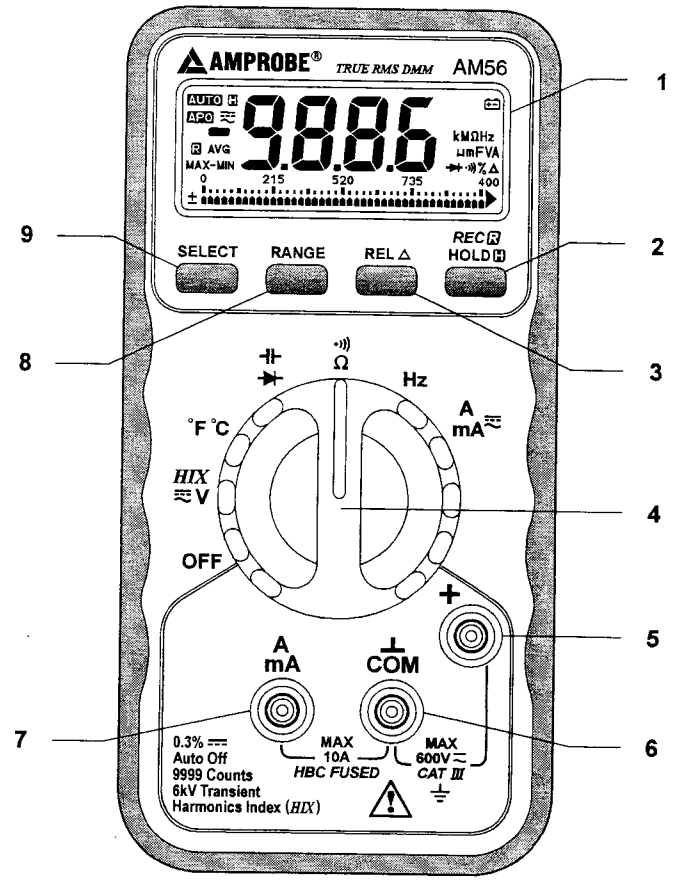


FIG 1. FRONT PANEL LAYOUT

(B) LCD ILLUSTRATION, See FIG 2

10. Low Battery alert, replace the battery as soon as possible to ensure accuracy
11. Δ annunciator indicates relative zero
12. Analog bar graph with overload flag and polarity
13. AVG MAX-MIN — These annunciators indicate MAX (Maximum), MIN (Minimum), MAX−MIN (Maximum minus Minimum), or AVG (Average) reading is being displayed
14. R — This annunciator indicates the RECORD function is activated
15. APO — This annunciator indicates Auto Power Off is enabled
16. AUTO — This annunciator indicates Autoranging
17. H — This annunciator indicates data HOLD function is activated
18. ⎓ annunciator indicates direct current (DC) is selected. ∼ annunciator indicates alternating current (AC) is selected

(C) ANALOG BAR GRAPH

The analog bar graph provides a visual indication of measurement like a traditional analog meter needle. It is excellent in detecting faulty contacts, identifying potentiometer clicks, and indicating signal spikes during adjustments.

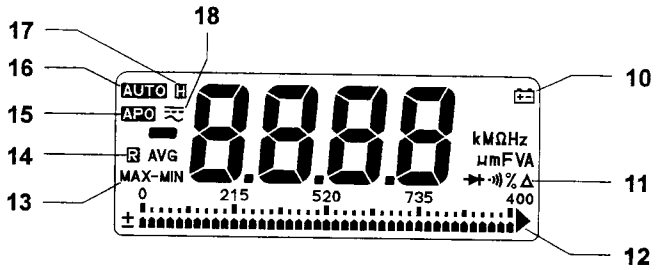


FIG 2. LCD DISPLAY (SHOWN ACTUAL SIZE)

(D) NMRR (Normal Mode Rejection Ratio)

NMRR is the DMM's ability to reject unwanted AC noise effect which can cause inaccurate DC measurements.

NMRR is typically specified in terms of dB (decibel). AM50 series has a NMRR specification of >50dB at 50 and 60Hz, which means a good ability to reject the effect of AC noise in DC measurements.

(E) CMRR (Common Mode Rejection Ratio)

Common mode voltage is voltage present on both the COM and VOLTAGE input terminals of a DMM, with respect to ground. CMRR is the DMM's ability to reject common mode voltage effect which can cause digit rattle or offset in voltage measurements.

AM50 series has a CMRR specifications of >60dB at DC to 60Hz in ACV function; and >100dB at DC, 50 and 60Hz in DCV function. If neither NMRR nor CMRR specification is specified, a DMM's performance will be uncertain.

(F) CREST FACTOR

Crest Factor is the ratio of the Crest (instantaneous peak) value to the True RMS value. That is :

$$\text{Crest Factor} = \frac{\text{Vcrest}}{\text{Vrms}}$$

A pure sinusoidal waveform has a Crest Factor of 1.414. A badly distorted sinusoidal waveform normally has a much higher Crest Factor. If you are measuring a signal above the DMM's specified Crest Factor, the DMM may not produce accurate measurements. AM53 and AM56 can accurately measure the True RMS value of voltage signal with a Crest Factor up to 3.0 at full scale, and 6.0 at half scale.

(G) AVERAGE RESPONDING RMS CALIBRATED

RMS (Root-Mean-Square) is the term used to describe the effective or equivalent DC value of an AC signal. Most digital multimeters use the Average responding RMS calibrated technique to measure RMS values of AC signals. This technique is to obtain the Average value by rectifying and filtering the AC signal. The Average value is then scaled upward (calibrated) to read the RMS value of a sine wave.

In measuring pure sinusoidal waveforms, this technique is cost effective and accurate. In measuring nonsinusoidal waveforms, however, significant errors can be introduced because of different scaling factors relating Average to RMS values.

(H) TRUE RMS

True RMS is a term which identifies a DMM that responds accurately to the effective RMS value regardless of the waveform.

True RMS voltage is the effective voltage having the same heating value corresponding a DC voltage. With True RMS voltage measurement, you can accurately measure the voltage values regardless of the waveforms such as: square, sawtooth, triangle, pulse trains, spikes, as well as distorted waveforms with the presence of harmonics. Harmonics may cause :

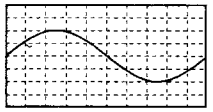
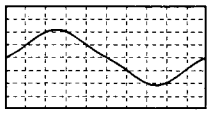
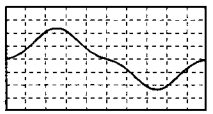
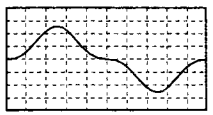
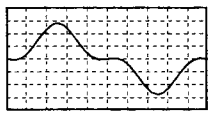
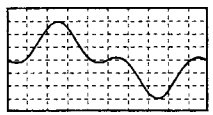
1) Overheated transformers, generators and motors to burn out faster than their shelf life
2) Circuit breakers to trip prematurely
3) Fuses to blow
4) Neutrals to overheat due to triplen harmonics present on the neutral (150Hz or 180Hz)
5) Bus bars and electrical panels to vibrate

(I)Harmonics Index™ (HIX)

Harmonics are unwanted AC voltages or currents with frequencies that are multiples of the fundamental frequency, which produce non-sinusoidal waveforms. Harmonic currents are typically caused by solid state lighting ballasts, solenoids, motor controllers, switching power supplies or any other nonlinear load. Consequently, the harmonic currents will cause voltage harmonics by distorting the system voltage sinusoidal waveform which, in turn, affects other loads within the system.

In the past, to identify the presence of harmonics which cause problems to your system, you may need an expensive instrument to see the complete harmonic spectrum with respect to the fundamental frequency. Now, harmonics index™ (HIX) function offers an alternative to indicate the presence of harmonics by a hand held digital multimeter in a cost effective way.

Harmonics Index™ (HIX) function generates a value between 0% to 100% to indicate the deviation of non-sinusoidal to a sinusoidal waveform, which is a good indication of the presence of harmonics. Pure sinusoidal waveforms without harmonics have a harmonics index™ value of 0%. The higher the harmonics index™ value, the more the harmonics are present. Harmonics index™ value examples are given in table 2 for your reference. Please note that in cases where the harmonics are mostly 3rd (triplen), the neutral current can be a nearly pure sine wave at the harmonic frequency of 150Hz or 180Hz (triplen) which can often be detected by measuring the frequency of the neutral current.

INPUT WAVEFORM	DESCRIPTION	HIX VALUE
	a) No distortion, pure Sinusoidal, $y=100\sin(\omega t)$	0%
	b) Fundamental with 10% 3rd harmonics, $y=100\sin(\omega t) + 10\sin(3\omega t+\pi)$	4%
	c) Fundamental with 20% 3rd harmonics, $y=100\sin(\omega t) + 20\sin(3\omega t+\pi)$	8%
	d) Fundamental with 30% 3rd harmonics, $y=100\sin(\omega t) + 30\sin(3\omega t+\pi)$	13%
	e) Fundamental with 40% 3rd harmonics, $y=100\sin(\omega t) + 40\sin(3\omega t+\pi)$	17%
	f) Fundamental with 50% 3rd harmonics, $y=100\sin(\omega t) + 50\sin(3\omega t+\pi)$	19%

Note: The AM56 will indicate Voltage Harmonics Index™ (HIX) if the input voltage level is between 0.5v and 600v. It is possible that the Voltage waveform is sinusoidal while the Current waveform is Non-Sinusoidal. The AM56 cannot indicate the HIX of a Current Waveform.

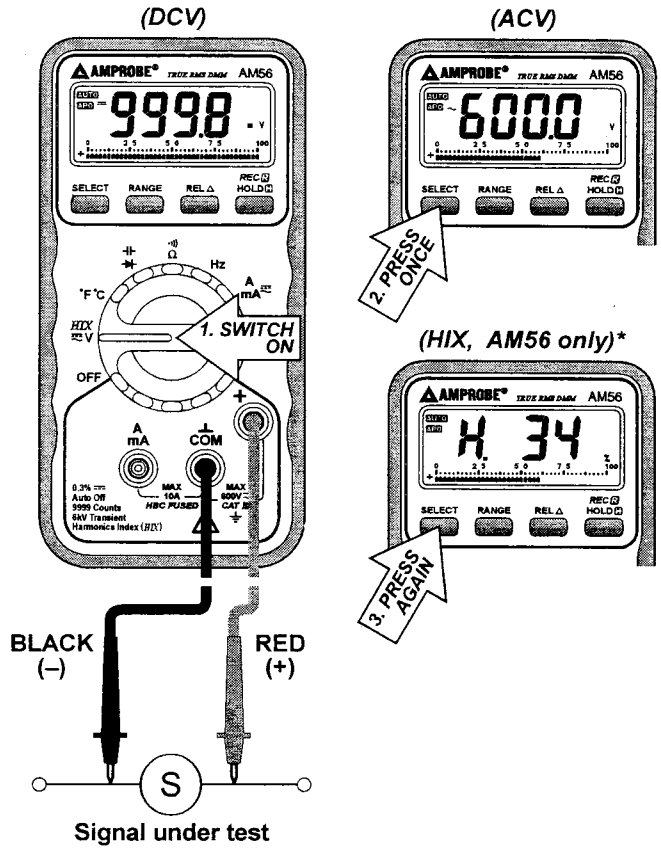
TABLE 2. HARMONICS INDEX™ VALUE EXAMPLE

Although HIX does not give you the whole harmonic spectrum like the other expensive harmonic analyzers do, HIX can effectively indicate the presence of Voltage Harmonics in most cases by a comparative percentage index. Harmonics normally appear in the Current waveforms, however, the current harmonics can distort the system voltage waveform and cause voltage harmonics. These voltage harmonics will then affect other devices within the same system.

IV) OPERATION

(A) DCV, ACV, HIX (AM56 only) functions

1) Set rotary switch to **V** position
2) Default at **DC**. Press **SELECT** button momentarily to select **AC**, and press again to select **HIX** if required
3) Insert red (+) test lead into + jack and black (−) test lead into **COM** input jack
4) Connect test leads to voltage source and observe the digital display, see FIG 3



*Note: In HIX function, the analog bargraph displays ACV levels.

FIG 3. DCV, ACV, HIX (AM56 only) FUNCTIONS

(B) Temperature function

1) Set rotary switch to **°C°F** position
2) Default at °C. Press **SELECT** button momentarily to select °F readings
3) Insert temperature adaptor with banana pins to K-type socket (optional accessory TAC-DMM) and K-type temperature probe (optional accessory) with positive (+) plug into + jack and negative (−) plug into **COM** input jack
4) Touch the end of the thermo probe to the measurement surface and observe the digital display, see FIG 4

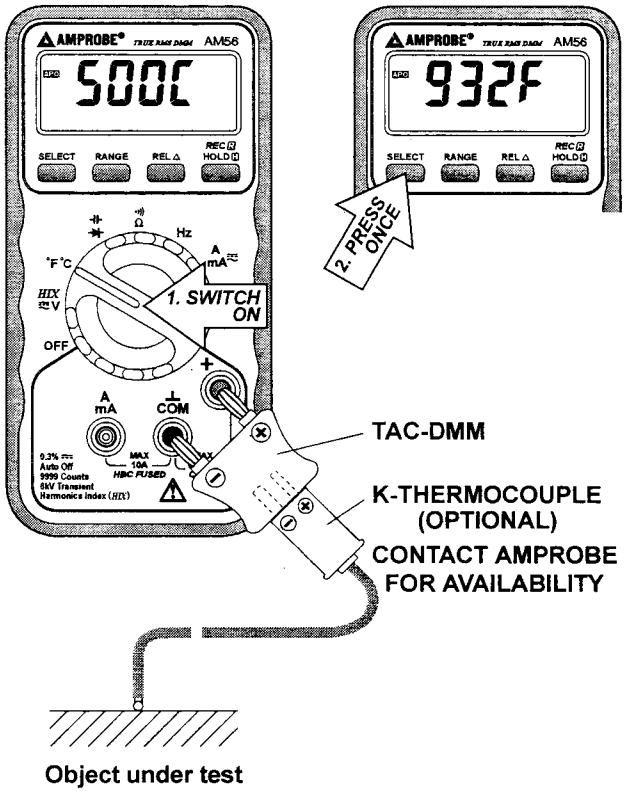


FIG 4. TEMPERATURE FUNCTION

(C) ⊣⊢ DIODE TEST function

1) Set rotary switch to ⊣⊢
2) Insert red (+) test lead into + jack and black (−) test lead into **COM** input jack
3) Connect the test leads as shown in FIG 5 and observe the digital display
4) Normal forward voltage drop (forward biased) for a good silicon diode is between 0.400V to 0.900V. A reading higher than that indicates a leaky diode (defective). A zero reading indicates a shorted diode (defective). An OL indicates an open diode (defective)
5) Reverse the test leads connections (reverse biased) across the diode
6) The digital display shows OL if the diode is good. Any other readings indicate the diode is resistive or shorted (defective)

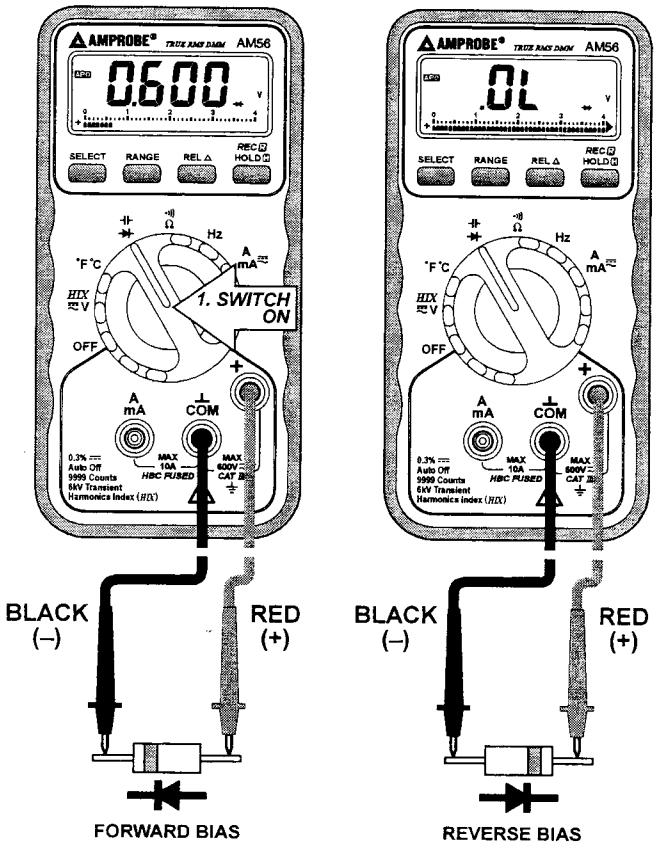


FIG 5. ⊣⊢ DIODE TEST FUNCTION

(D) ⊣⊢ CAPACITANCE function (not available in AM50)

1) Set rotary switch to →| ⊣⊢
2) Default at →| diode. Press **SELECT** button momentarily to select ⊣⊢ capacitance
3) Insert red (+) test lead into ⊣⊢ jack and black (−) test lead into **COM** input jack
4) Connect the test leads as shown in **FIG 6** and observe the digital display

CAUTION

Discharge capacitors before making any measurement. Large value capacitors should be discharged through an appropriate resistance load

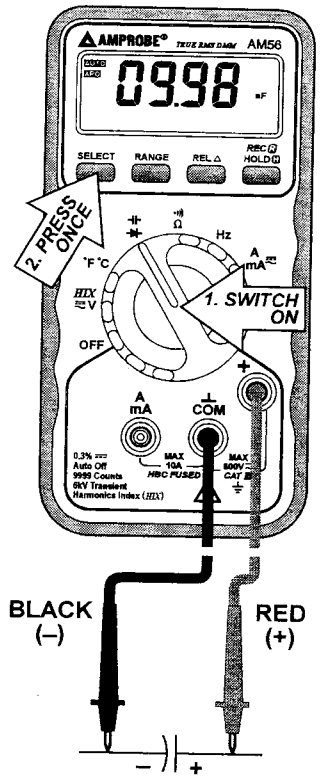


FIG 6. CAPACITANCE FUNCTION (not available in AM50)

(E) Ω RESISTANCE, •))) CONTINUITY functions

1) Set rotary switch to Ω •)))
2) Insert red (+) test lead into + jack and black (−) test lead into **COM** input jack
3) Connect the test leads as shown in FIG 7 and observe the digital display
4) Default at Ω. Press **SELECT** button momentarily to select •))) Continuity function (AM50 at ⊣⊢ •)))
5) A continuous beep tone indicates a complete wire. This is useful for checking wiring connections and operation of switches

CAUTION

Using resistance measurement function in a live circuit will produce false results and may damage the instrument. In many cases the suspect component must be disconnected from the circuit to obtain an accurate reading

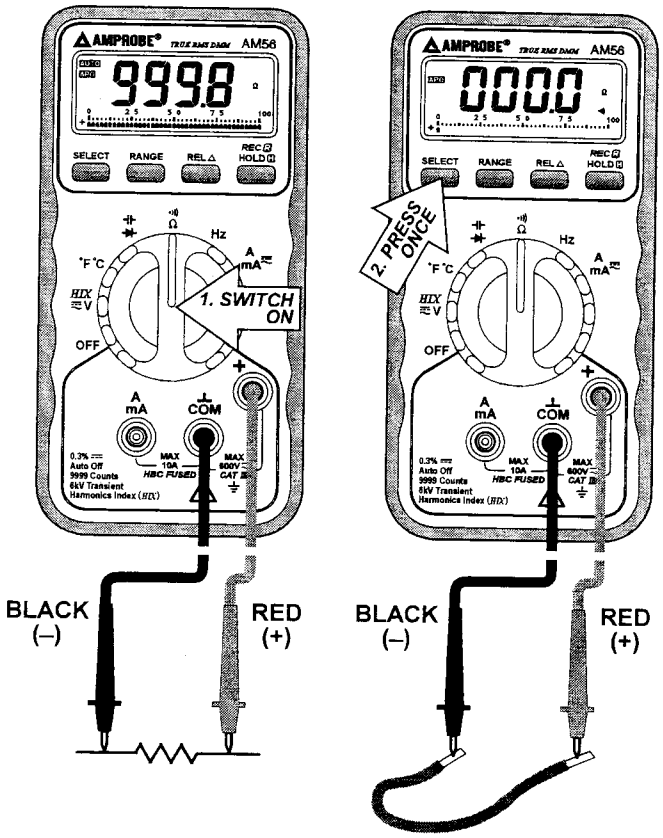


FIG 7. Ω RESISTANCE, •))) CONTINUITY FUNCTIONS

(F) Hz function (not available in AM50)

1) Set rotary switch to **Hz**
2) Insert red (+) test lead into + jack and black (−) test lead into **COM** input jack
3) Connect test leads to signal source and observe the digital display, see FIG 8
4) If the reading is unstable, select lower sensitivities (higher trigger level) 2V, 20V, or 200V by pressing the RANGE button. If the reading shows zero, select higher sensitivities. Power up default is at 1V for highest sensitivity

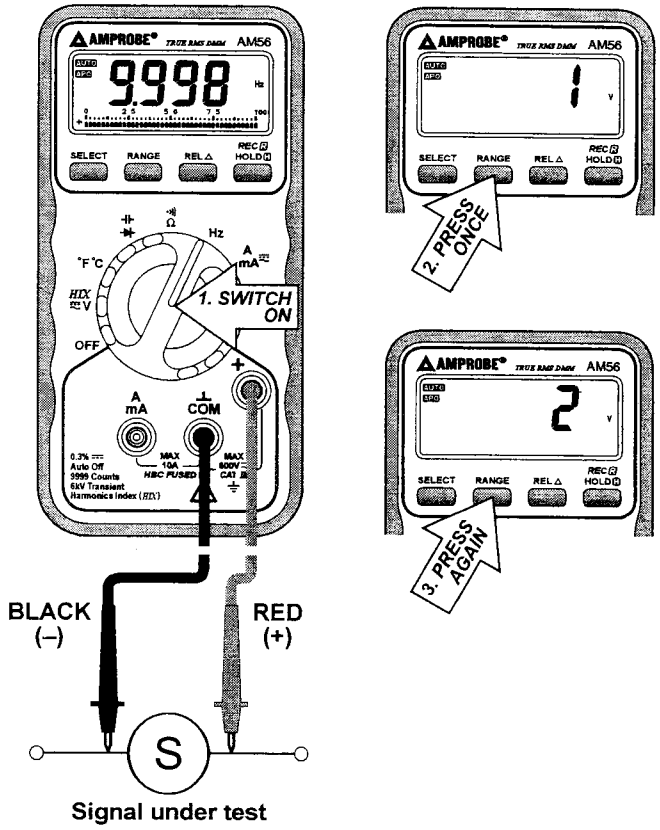


FIG 8. Hz FUNCTION (not available in AM50)

(G) mA, A functions (AM55 & AM56 only)

1) Set rotary switch to **mA A**
2) Insert red (+) test lead into **mA A** jack and black (−) test lead into **COM** input jack
3) Default at **DC**. Press **SELECT** button momentarily to select **AC**
4) Connect the test leads as shown in FIG 9 and observe the digital display

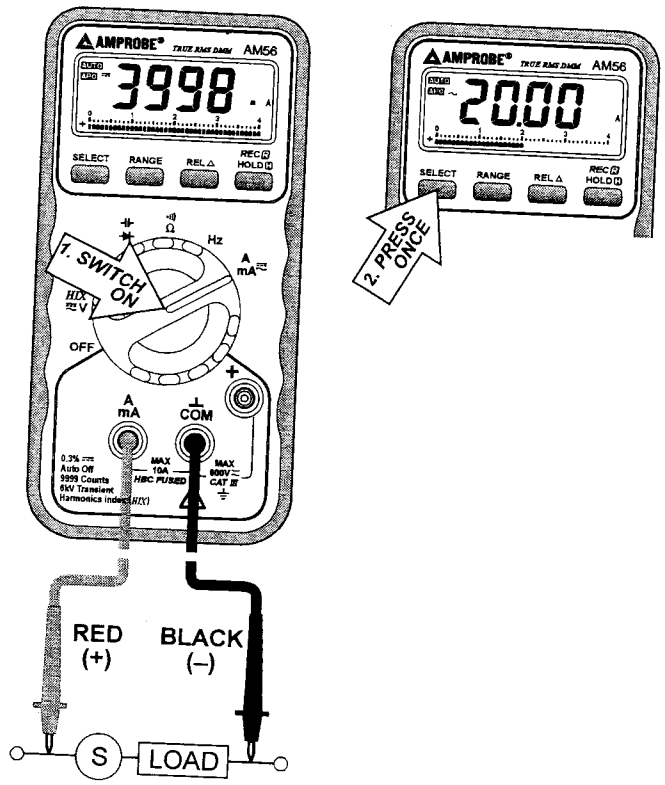
WARNING

Do not measure any circuit that draws more than the current rating of the protection fuse. If the fuse blows, replace it with the proper fuse. Failure to do this may result in injury or damage to the meter. Do not attempt a current measurement where the open circuit voltage is above 600V. Suspected open circuit voltage must be checked with voltage functions

(H) MANUAL OR AUTO RANGING

Press the **RANGE** button momentarily to select manual-ranging, and the meter will remain in the range it was in, the LCD annunciator AUTO turns off. Press the button momentarily again to step through the ranges. Press and hold the button for 1 second or more to resume auto-ranging

Note : When the meter is in Record, Hold, or Relative mode, changing the measuring range manually will cause the meter to exit those features



Signal under test

FIG 9. mA, A FUNCTION (AM55 & AM56 only)

(I) ΔRELATIVE MODE

Press the Δ button momentarily to enter the Relative Zero (Δ) mode, the LCD annunciator Δ turns on. Relative zero allows the user to offset the meter measurements with a relative reference value. Practically all displaying readings can be set as relative reference value including MAX, MIN, MAX-MIN, and AVG readings of RECORD function

Press the Δ button again to exit relative mode and resume normal measurements

(J) HOLD

The hold function freezes the display for later view. Press the **HOLD** button momentarily to activate the hold function, the LCD annunciator turns on. Press momentarily again to release

(K) RECORD MODE

Press and hold the **REC** button for 1 second or more to activate RECORD mode, the LCD annunciators AVG MAX-MIN turn on. The meter beeps when new maximum or minimum reading is updated. Press the button momentarily to read throughout the Maximum (MAX), Minimum (MIN), Maximum minus Minimum (MAX−MIN), and Average (AVG) readings. Press the button for 1 second or more to exit RECORD mode. See FIG 10

With the Auto-Ranging RECORD mode, you can easily track intermittent signals, capture turn-on/turn-off surges, and monitor line voltage changes over a much wider dynamic range with the best resolution. It largely

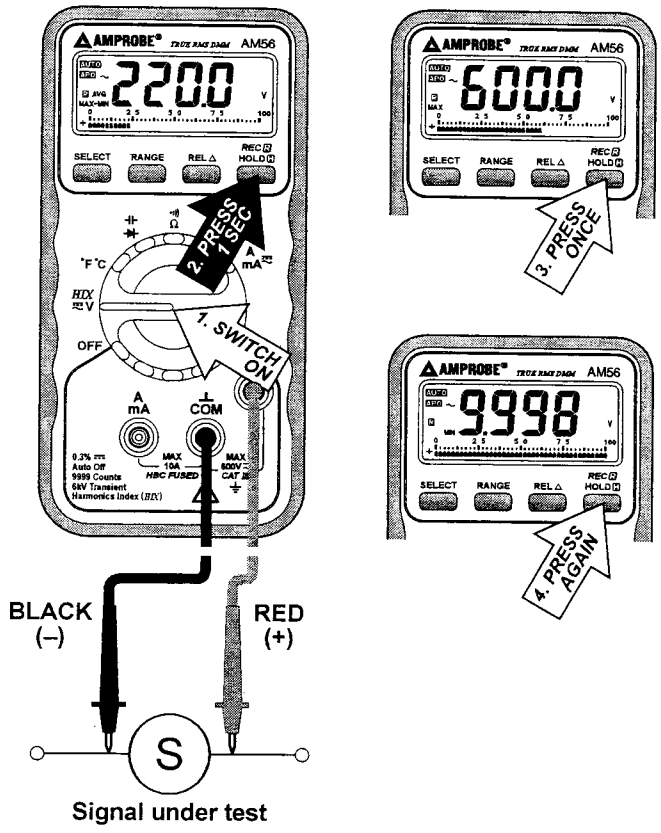


FIG 10. RECORD FUNCTION

surpasses single range recording which is easily over-flowed, or with insufficient resolution. The meter features a fast single range sampling speed of 50ms for MAX, MIN, MAX-MIN and AVG readings. The faster the sampling speed, the more accurate the measurement of surges, spikes and sags will be. The true average AVG feature calculates all readings taken over time continually

Note:1. Auto Power Off feature will be disable automatically in this mode

(L) LINE FILTER FREQUENCY 50 Hz OR 60 Hz SELECTION

The line filter frequency can be selected as a power-on option. Press the **SELECT** button while turning the meter on to display the set frequency. Press the **RANGE** button for 50 Hz or press the **REL Δ** button for 60 Hz selection. Then press the **HOLD** button to store the selected frequency. See FIG 11

Selecting the appropriate line filter frequency to cope with your line frequency can maximize the meter's noise rejection ability. This is normally only available in expensive bench top multimeter

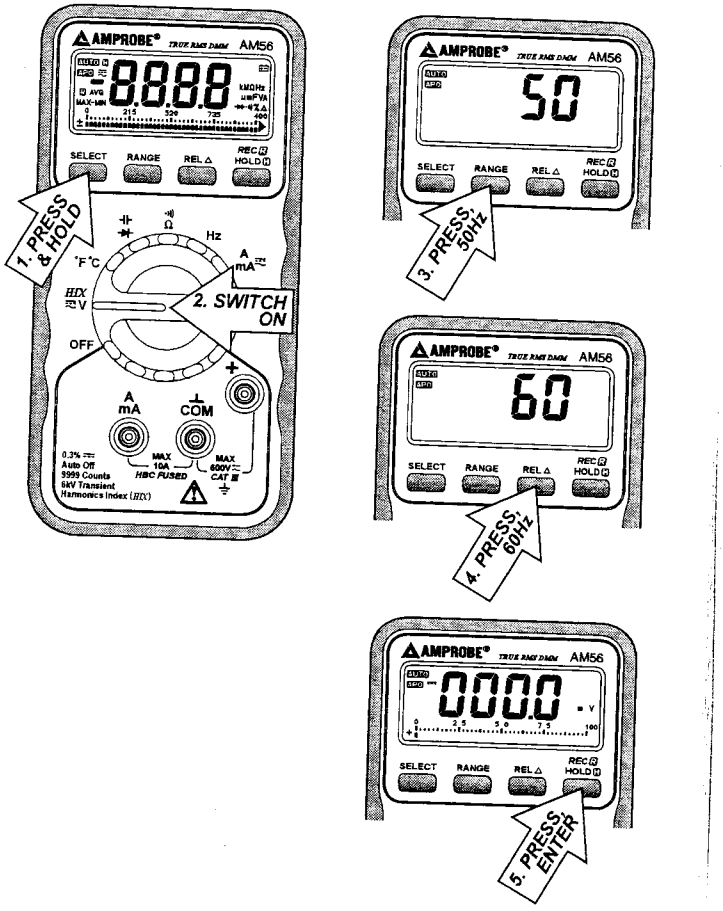


FIG 11. LINE FREQUENCY SELECTION

(M) AUTO POWER OFF (APO)

The Auto Power Off (APO) mode turns the meter off automatically to extend battery life after 4 minutes of inactivities. The meter turns back on if the rotary switch is turned. Activities are specified as :

1)Rotary switch or push button operations

2)Significant measuring data readings

When the meter enters the RECORD mode, the Auto Power Off will be disabled automatically, and the LCD annunciator APO will be off

Note : Always turn the rotary switch to the OFF position when the meter is not in use. The meter will produce a beep sound to alert the user while turn off

(V) SPECIFICATIONS

GENERAL SPECIFICATIONS

Display : 4 digits 9999 counts LCD

Polarity : Automatic

Update Rate :

Data: 4 per second nominal;

42 Segments Bar graph: 20 per second max

Low Battery: Low battery indicator appears when the battery voltage drops below approx. 7.2VDC

Operating Temperature : 0℃ to 35℃, 0-80% R.H.; 35℃ to 40℃, 0-70% R.H.

Storage Temperature : -20℃ to 55℃, 0-80% R.H. (with battery removed)

Temperature Coefficient : nominal 0.15 x (specified accuracy)/℃ @ 0℃-18℃ or 28℃-40℃

Power Supply : Single 9V battery; NEDA1604, JIS006P or IEC6F22

APO Timing : Idle for 4 minutes

APO Consumption : 30 μ A Typical

Overload Protections :

mA & A : 15A/600V HBC Fuse, IR 100kA;

Others : 600VDC/VAC rms

Safety: The instruments meet the requirements for double insulation, pollution degree 1, to IEC1010-1(1995), EN 61010-1(1995), UL3111-1(6.1994), CSA C22.2 NO. 1010-1-92 to:

terminal V/R: Installation category III, 600V ac and dc

terminal mA/A: (AM55 & AM56 only)
Installation category III, 600 Volts ac.
Installation category II, 250 Volts dc.

E.M.C. : Meets EN55011(3.1991) and EN50082-1(1992)

Sensing : True RMS for AM53 & AM56; Average responding for AM50 & AM55

Dimension : L150mm X W75mm X H34mm (without holster); L160mm X W82mm X H48mm (with holster)

Weight : approx. 252 gm (without holster); approx. 345 gm (with holster)

Power Consumption : 3.5 mA Typical

Accessories : Test leads (pair), battery installed and user's manual

Special Features : Autoranging Record (Max, Min, Max-Min, Avg), Autoranging Relative (Zero), and Data Hold

ELECTRICAL SPECIFICATIONS

ACCURACY IS ±(% READING DIGITS + NUMBER OF DIGITS) OR OTHERWISE SPECIFIED, AT 23℃ ±5℃ & LESS THAN 75% R.H.

DC Voltage

Range	AM50	AM53	AM55	AM56
	Accuracy			
999.9 mV, 9.999 V, 99.99 V	0.4%+4d	0.3%+3d		
600.0 V	0.4%+5d	0.3%+5d		

NMRR : >50dB @ 50/60Hz
CMRR : >100dB @ DC, 50/60Hz, Rs=1kΩ
Input Impedance : 10MΩ, 30pF nominal (16MΩ nominal for 999.9mV range)

AC Voltage

Range	AM50	AM53*	AM55	AM56*
	Accuracy			
50Hz — 200Hz				
999.9mV	2.5% + 5d			
50Hz — 500Hz				
9.999V, 99.99V, 600.0V	1.5% + 4d	1.2% + 4d	1.5% + 4d	1.2% + 4d
500Hz — 2kHz				
9.999V, 99.99V, 600.0V	Unspec'd	2.0% + 5d**	Unspec'd	2.0% + 5d**

CMRR : >60dB @ DC to 60Hz, Rs=1kΩ
Input Impedance : 10MΩ, 30pF nominal (16MΩ nominal for 999.9mV range)
Trms Crest factor : <3:1 at full scale, and < 6:1 at half scale
*True RMS Specified from 5% to 100% of range
**True RMS Specified from 10% to 100% of range

DC Current

Range	AM50	AM53	AM55	AM56
	Accuracy			
4000mA	N/A	N/A	0.9% + 4d	0.9% + 4d
10.00A*	N/A	N/A	0.7% + 3d	0.7% + 3d

Burden Voltage : 0.03V/A
*10A Continuous; 20A for 30 Second Max with 5 minutes cool down interval

AC Current

Range	AM50	AM53	AM55	AM56*
	Accuracy			
50Hz — 500Hz				
4000mA	N/A	N/A	±2.0% + 6d	±2.0% + 6d**
10.00A***	N/A	N/A	±1.2% + 5d	±1.2% + 4d
500Hz — 2kHz				
10.00A***	N/A	N/A	Unspec'd	±3% + 5d

Burden Voltage : 0.03V/A

*True RMS Specified from 10% to 100% of range

**True RMS Specified from 25% to 100% of range

***10A Continuous; 20A for 30 Second Max with 5 minutes cool down interval

Harmonics Index™ HIX (AM56 only)

Range	0.0% to 99.9%
Input Voltage	500mVAC to 600VAC

Ohms

Range	AM50	AM53	AM55	AM56
	Accuracy			
999.9Ω	1.2%+6d	0.5%+6d		
9.999kΩ, 99.99kΩ	1.2%+3d	0.5%+2d		
999.9kΩ, 4.000MΩ	1.5%+3d	0.8%+2d		
40.00MΩ	4%+3d	1.5%+2d		

Open Circuit Voltage : Typical 1.3VDC (2.7VDC @ 999.9Ω Range)

Capacitance

Range	AM50	AM53	AM55	AM56
	Accuracy*			
1.000uF	N/A	1.0% + 4d		
10.00uF, 100.0uF	N/A	1.0% + 3d		
1.000mF	N/A	2.0% + 4d		
10.00mF	N/A	4.0% + 5d		

* Accuracies with film capacitors, or capacitors that have negligible dielectric absorption

Frequency

Range	AM50	AM53	AM55	AM56
	Accuracy			
9.999Hz,	N/A	0.04% + 4d		
99.99Hz, 999.9Hz, 9.999kHz, 50.00kHz	N/A	0.02%+4d		

Selectable Sensitivities : 1Vrms, 2Vrms, 20Vrms, & 200Vrms
(by RANGE button)

Input Signal : Sine wave, or Square wave with duty cycle $>40\%$ & $<70\%$

Temperature

Range	Accuracy
-20℃ to 300℃ / 0°F to 572°F	±(3℃+1d) / ±(6°F+2d)
301℃ to 500℃ / 573°F to 932°F	±(2%+1d) / ±(2%+2d)

Sensor : "K" Type Thermocouple, sensor accuracy not included

Diode Tester

Range	Test Current (Typical)	Open Circuit Voltage
9.999V	0.5mA	< 3.5 VDC

•)) Audible Continuity Tester

AM53 AM55 AM56
Audible threshold : the beeper sounds if the measured resistance is lower than 10 Ω, and turns off when greater than 200 Ω. Response time $<150\,\mu s$
AM50
Audible threshold : the beeper sounds if the measured voltage is lower than 30 mV, and turns off when greater than 200 mV. Response time <500 ms

VI) MAINTENANCE

WARNING

To avoid electrical shock, remove test leads and any input signals before opening the case. Do not operate with open case. Install only the same type of fuse or equivalent
"Pour Votre Securite Debrancher Les Cables Avant D'Ouvir" and "Pile: 9v"

Battery replacement procedure

When the battery symbol [+-] on the display is on, replace the battery as soon as possible to ensure accuracy. The meter uses a single standard 9V battery (NEDA1604, JIS006P, IEC6F22)

1) Disconnect the meter from any circuit and remove the test leads from the input jacks
2) Turn the meter OFF
3) Loosen the three captive screws from the case bottom, see FIG 12
4) Lift the end of the case bottom nearest the input jacks until it unsnaps from the case top
5) Disconnect the battery from the battery connector
6) Snap the battery connector to the terminals of the replacement battery. Dress the battery leads so that they are properly seated and will not be pinched between the case top and case bottom
7) Replace the case bottom, ensuring that all the gaskets are properly seated and the two snaps on the case top (near the LCD side) are engaged
8) Re-fasten the 3 captive screws

Cleaning and Storage

Periodically wipe the case with a damp cloth and mild detergent; do not use abrasives or solvents. If the meter is not to be used for periods of longer than 60 days, remove the battery and store it separately

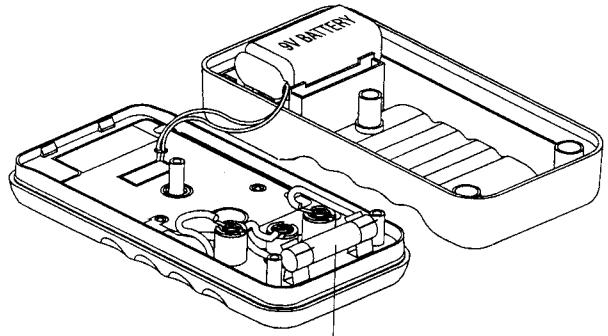


FIG 12. CHANGING BATTERY & FUSE

Fuse replacement procedure

The meter uses a 600V/15A IR 100kA fast acting fuse for current input

1) Perform steps 1) through 4) of the battery replacement procedure
2) Replace the blown fuse
3) Perform step 7) through 8) of the battery replacement procedure

Accessories and replacement parts

Amprobe P/N	Description
MTL-90A	AM50 Series Test Leads
H-50	AM50 Series Holster
KLK15	AM50 Series Fuse, 600V/15A
97758	AM50 Series Inst. Manual
MN1604	9 Volt Battery
TAC-DMM	Temperature Adaptor, Banana to K-type single thermocouple
TPK-56	K-Bead Probe, -50°C to +800°C, -58°F to +1472°F

Note: Contact Amprobe at 1-800-477-8658 for a complete offering on K-type thermocouples

LIMITED WARRANTY

Congratulations! You are now the owner of an AMPROBE instrument. It has been crafted according to the highest standards of quality and workmanship. This instrument has been inspected for proper operation of all of its functions. It has been tested by qualified factory technicians according to the long-established standards of AMPROBE INSTRUMENT.

Your AMPROBE instrument has a limited warranty against defective materials and/or workmanship for one year from the date of purchase provided the seal is unbroken or, in the opinion of the factory, the instrument has not been tampered with or taken apart aside from changing the battery.

Should your instrument fail due to defective materials and/or workmanship during the one-year warranty period, return it along with a copy of your dated bill-of-sale which must identify the instrument by model number and serial number.

IMPORTANT: For your protection, please use the instrument as soon as possible. If damaged, or should the need arise to return your instrument, place it in a shipping carton packed with sufficient cushioning material. It must be securely wrapped, Amprobe is not responsible for damage in transit. Be sure to include a packing slip (indicating model and serial number) along with a brief description of the problem. Make certain your name and address appears on the box as well as packing slip.

Ship prepaid via Air Parcel Post insured or U.P.S. (where available) to :

Service Division
AMPROBE INSTRUMENT
630 Merrick Road (use for U.P.S.)
P.O.Box 329 (use for Parcel Post)
Lynbrook, NY 11563-0329

Outside the U.S.A. the local Amprobe representative will assist you. Above limited warranty covers repair and replacement only and no other obligation is stated or implied.