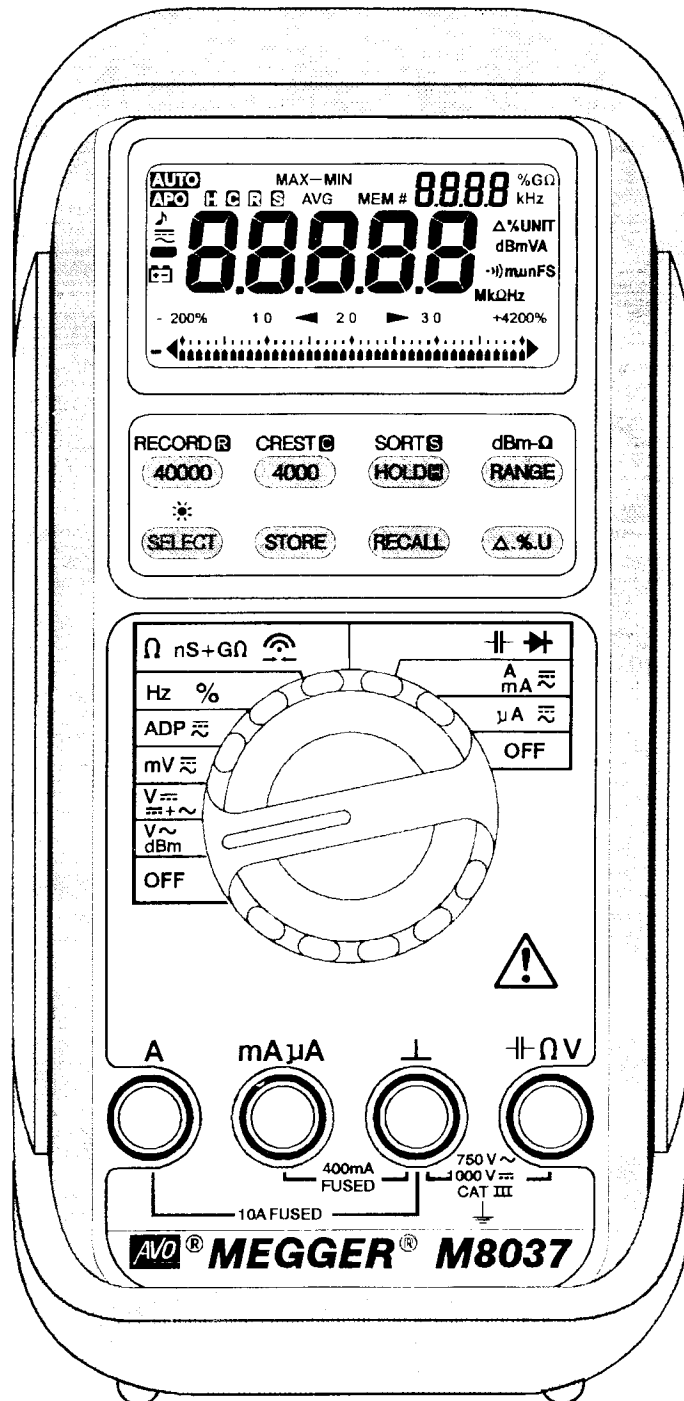







# Multimeter MEGGER® M8035 & M8037

## USER GUIDE



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## I) SAFETY

This instrument is designed and manufactured to meet double insulation requirements to International Safety Standard IEC1010-1.



### SAFETY WARNINGS






- \* Test leads, prods and crocodile clips **MUST BE** in good order; clean, and with no broken or cracked insulation.
- \* Test leads must be disconnected from circuit under test **before** changing switch positions.
- \* U.K. Safety Authorities recommend the use of fused test leads when measuring voltage on high energy systems.
- \* Voltage measurement **must not** be attempted with test leads inserted in the **A** or **mA/uA** terminals.
- \* If unsure of required range, start with the highest range and work downwards.
- \* Circuit and test lead tips **must not be** touched during testing.
- \* Replacement fuses **must be** of the correct size, type and rating.

**SAFETY WARNINGS AND PRECAUTIONS MUST BE READ  
AND UNDERSTOOD BEFORE THE INSTRUMENT IS USED.  
THEY MUST BE OBSERVED DURING USE.**

**NOTE:  
THE INSTRUMENTS MUST ONLY BE USED BY  
SUITABLY TRAINED AND COMPETENT PERSONS.**

**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	$\Omega$ V  & COM	1000 VDC or Vpeak
AC VOLTAGE		
DC+AC VOLTAGE		
mV MILLI-VOLT	$\Omega$ V  & COM	600 VDC or VAC rms
ADP ADAPTOR		
Hz FREQUENCY		
% DUTY CYCLE		
$\Omega$ RESISTANCE		
nS CONDUCTANCE		
 AUDIBLE CONTINUITY		
 CAPACITANCE		
 DIODE TEST		
A CURRENT	A & COM	10A/600V*
mA or uA CURRENT	mA uA & COM	630mA/500V

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

**TABLE 1**

## 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

## II ) GENERAL DESCRIPTION

The M8035 and M8037 are hand held, battery operated professional quality digital multimeters for today's complex electrical & electronic system diagnostic and troubleshooting. M8037 further offers DC+AC TRUE RMS responding with wide AC bandwidth for non-sinusoidal waveforms measurements, as well as BACK LIGHTED LCD display for all light condition applications.

The measuring functions include DC Voltage, AC Voltage, DC+AC Voltage (M8037 only), dBm (M8037 only), Adaptor input, Frequency, Duty Cycle, Resistance, Conductance, Continuity Test, Capacitance, Diode Test, DC Current as well as AC Current.

Pushbutton functions include 4000 Counts Fast Measuring mode, 40,000 Counts High Resolution Slow Measuring mode, Data Hold, Auto or Manual Ranging, Data Store & Recall, Relative Zero mode, Relative Percent Change mode, Relative Per Unit mode, 50ms Record MAX/MIN/MAX-MIN/AVG, 0.8ms Crest MAX/MIN/MAX-MIN, Sort™ MAX/MIN/MAX-MIN/AVG, dBm Reference Impedances Selection (M8037 only) as well as Secondary Functions Selection.

Power on options include Line Filter Frequency 50/60Hz Selection for best noise rejection ( normally only available in expensive bench top instruments ), Auto Power off Disable as well as Beeper Disable.

This series is housed inside a gasket sealed heavy duty 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 retarded material to maximize durability of the meter, and safety to the user. In addition, a sealed battery compartment design keeps battery leakage contaminants off the PC board, which largely reduces the potential risks of shortages and degrading of accuracy due to the contaminants.





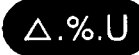


This environmental friendly series contains NO CFC Ozone Depleting Substances, and is NOT manufactured with such substances.



### III) PRODUCT FEATURES

#### (A) PANEL ILLUSTRATION, S1

ee **FIG 1**

1. **LCD display** 4-3/4 digit 40000 counts + 4 digit 9999 counts dual display LCD
2. ** ** Pushbutton. Press momentary to activate HOLD, or press and hold for 1 second to activate SORT™ function
3. ** ** Pushbutton to select Auto/Manual ranging, or to select different reference impedances in dBm function (M8037 only)
4. **** Pushbutton to select Relative Zero, Relative Percentage Change, or Relative Per Unit mode
5. **** Pushbutton to Recall stored data
6. **Selector** Turn the Power On or Off and Select a function
7. **COM** Common (Ground reference) Input Jack for all functions
8. **** Input Jack for all functions EXCEPT current functions, color coded
9. **A** Input Jack for 4A or 10A current functions, color coded

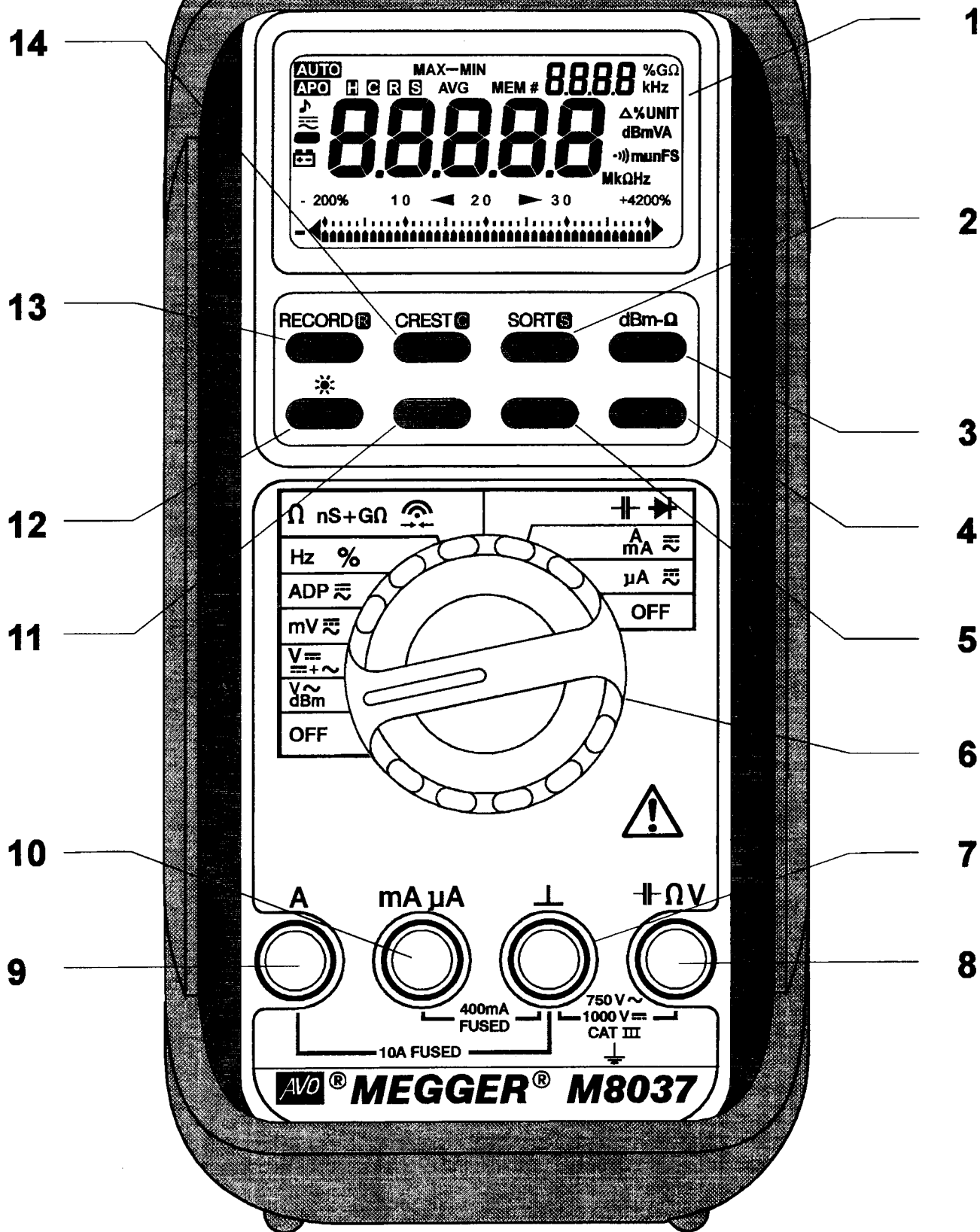





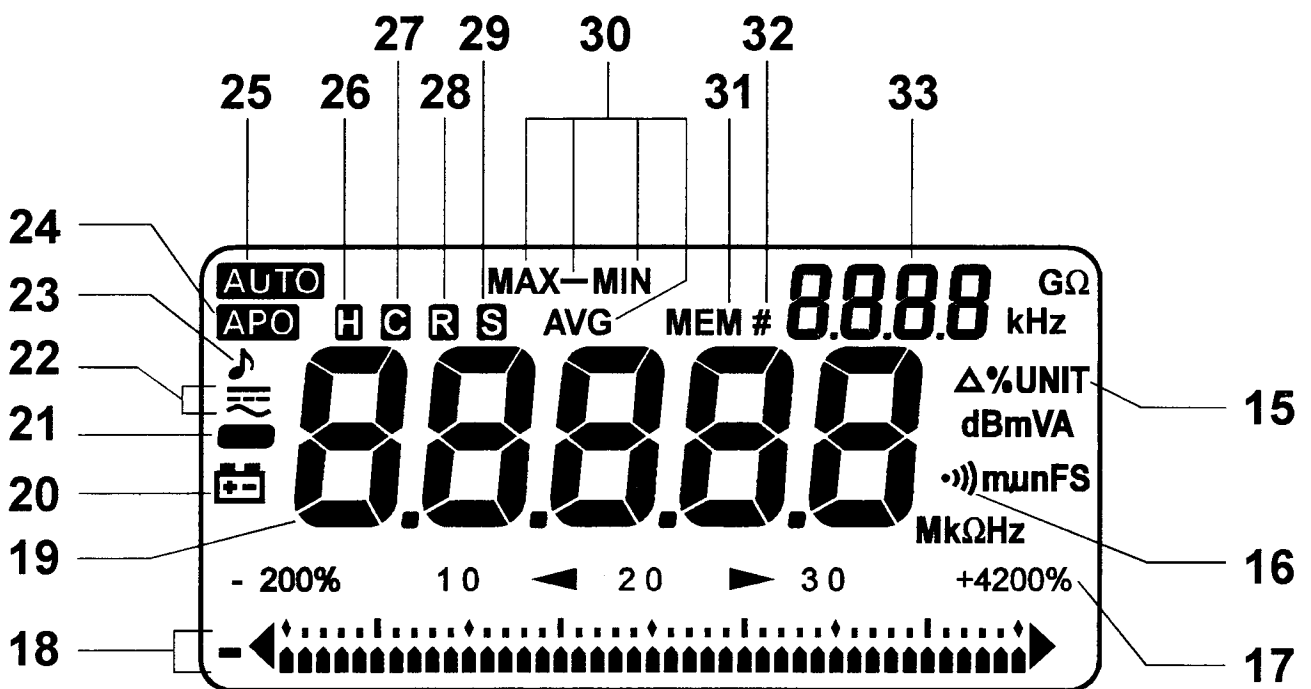


FIG 1. FRONT PANEL LAYOUT






10. mA uA Input Jack for 400mA, 40mA, 4000uA, or 400uA current functions, color coded
11.  Pushbutton to store displaying data for later recall
12.  Pushbutton. Press momentary to select secondary functions. Press and Hold for 1 second to turn on the LCD back light (M8037 only)
13.  Pushbutton. Press momentary to select 40,000 counts, or Press and Hold for 1 second to activate RECORD function
14.  Pushbutton. Press momentary to select 4,000 counts fast mode, or Press and Hold for 1 second to activate CREST function

**(B) LCD ILLUSTRATION, See FIG 2**

15.  $\Delta$  .% .UNIT  $\Delta$  annunciator indicates relative zero.  
 $\Delta$  % annunciators together indicate relative percentage change  
 $\Delta$  UNIT annunciators indicate relative per unit
16.  This annunciator indicates audible continuity function



**FIG 2. LCD DISPLAY ( SHOWN ACTUAL SIZE )**

- 17. **+4200%** Analog bar graph scale
- 18.  Analog bar graph with overload flag and polarity
- 19. **DATA** Main digital readings of data being measured
- 20.  Low Battery alert, replace the battery as soon as possible to ensure accuracy
- 21.  This symbol indicates Negative Polarity
- 22.  **≡** annunciator indicates direct current (DC) is selected. **~** annunciator indicates alternating current (AC) is selected. **≡** annunciator indicates DC + AC is selected
- 23.  This annunciator indicates beeper is on
- 24. **APO** This annunciator indicates Auto Power Off is enabled
- 25. **AUTO** This annunciator indicates Autoranging
- 26. **H** This annunciator indicates data HOLD function is activated
- 27. **C** This annunciator indicates the CREST function is activated

- 28. **R** This annunciator indicates the RECORD function is activated
- 29. **S** This annunciator indicates the SORT™ function is activated
- 30. **MAX—MIN  
AVG** This annunciators indicate MAX (Maximum), MIN (Minimum), MAX—MIN (Maximum minus Minimum), or AVG (Average) reading is being displayed
- 31. **MEM** This annunciator blinks 2 times to confirm data storage when the STORE pushbutton is pressed, and turns on with the recalled data when the RECALL pushbutton is pressed
- 32. **#** This annunciator together with the secondary display data indicate the number of event in the SORT™ function
- 33. **DATA** Secondary display for Dual Display data

### **(C) ANALOG BAR GRAPH**

The analog bar graph provides a visual indication of measurement like a traditional analog meter needle. The M8030 analog bar graph updates 128 times per second in DCV and RESISTANCE functions showing excellent signal pattern in detecting faulty contacts, identifying potentiometer clicks, and indicating signal spikes during adjustments.

#### **(D) CREST FACTOR**

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

$$\text{Crest Factor} = \frac{V_{\text{crest}}}{V_{\text{rms}}}$$

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. M8037 can accurately measure the True RMS value of voltage signal with a Crest Factor of at least 3.0 at full scale, and 6.0 at half scale.

#### **(E) AVERAGE RESPONDING RMS CALIBRATED (M8035)**

RMS (Root-Mean-Square) is the term used to describe the effective or equivalent DC value of an AC signal. Most digital multimeters use 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 waveform, 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.

**(F) DC + AC TRUE RMS (M8037)**

DC + AC True RMS is a term which identifies a DMM that responds accurately to the total effective RMS value regardless of the waveform, and is given by the expression :

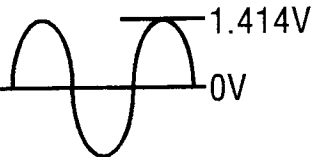

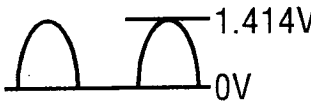
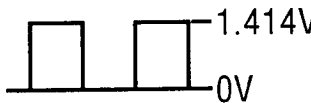
$$\sqrt{DC^2 + (AC \text{ rms})^2}$$

DC + AC True RMS voltage is the total effective voltage having the same heating value corresponding a DC voltage. With DC + AC 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 and DC components. Harmonics and DC components 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 (180Hz)
- 5) Bus bars and electrical panels to vibrate

AC only True RMS and Average responding meters can introduce significant errors in many applications. See **TABLE 2** for typical example.



INPUT WAVEFORM	DC+AC TRMS	AC TRMS	AVERAGE REPNSE
<p><b>Sine</b></p> 	<p>1.000V  <b>ERROR=</b>  <b>0%</b>                      CF=1.414</p>	<p>1.000V  <b>ERROR=</b>  <b>0%</b>                      CF=1.414</p>	<p>1.000V  <b>ERROR=</b>  <b>0%</b></p>
<p><b>Full wave rectified Sine</b></p> 	<p>1.000V  <b>ERROR=</b>  <b>0%</b>                      CF=1.414</p>	<p>0.436V  <b>ERROR=</b>  <b>56.4%</b>                      CF=3.247</p>	<p>0.421V  <b>ERROR=</b>  <b>57.9%</b></p>
<p><b>Half wave rectified Sine</b></p> 	<p>0.707V  <b>ERROR=</b>  <b>0%</b>                      CF=2.000</p>	<p>0.546V  <b>ERROR=</b>  <b>22.7%</b>                      CF=2.591</p>	<p>0.550V  <b>ERROR=</b>  <b>22.2%</b></p>
<p><b>50% duty pulse train</b></p> 	<p>1.000V  <b>ERROR=</b>  <b>0%</b>                      CF=1.414</p>	<p>0.707V  <b>ERROR=</b>  <b>29.3%</b>                      CF=2.000</p>	<p>0.785V  <b>ERROR=</b>  <b>21.5%</b></p>

**TABLE 2. WAVEFORMS AND CREST FACTORS**

### **(G) ACV BANDWIDTH**

ACV bandwidth of a DMM is the range of frequencies over which ACV measurements can be made within the specified accuracy. In other words, a DMM cannot accurately measure the ACV value with frequency spectrums beyond the frequency response of the DMM. In reality, complex waveforms, noise and distorted waveforms contain much higher frequency spectrum than its fundamentals. M8030 series has ACV bandwidth specifications up to 20kHz in most ranges, and extended bandwidth specification up to 50kHz on M8037 AC 400mV range.

### **(H) 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). M8030 series has a NMRR specification of  $>60\text{dB}$  at 50 and 60Hz, which means the effect of AC noise is reduced more than 1000 times in DC measurements.

### **( I ) 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.

M8030 series has a CMRR specifications of  $>60\text{dB}$  at DC to 60Hz in ACV function; and  $>120\text{dB}$  at DC, 50 and 60Hz in DCV function. If neither NMRR nor CMRR specification is specified, the DMM's performance will be uncertain.

## IV) BASIC OPERATION

### (A) DC VOLTAGE function

- 1) Set rotary switch to  $\overline{V}$  position
- 2) Insert red (+) test lead into  $\Omega V \overline{H}$  jack and black (-) test lead into **COM** input jack
- 3) Connect test leads to voltage source and observe the digital display, see **FIG 3**

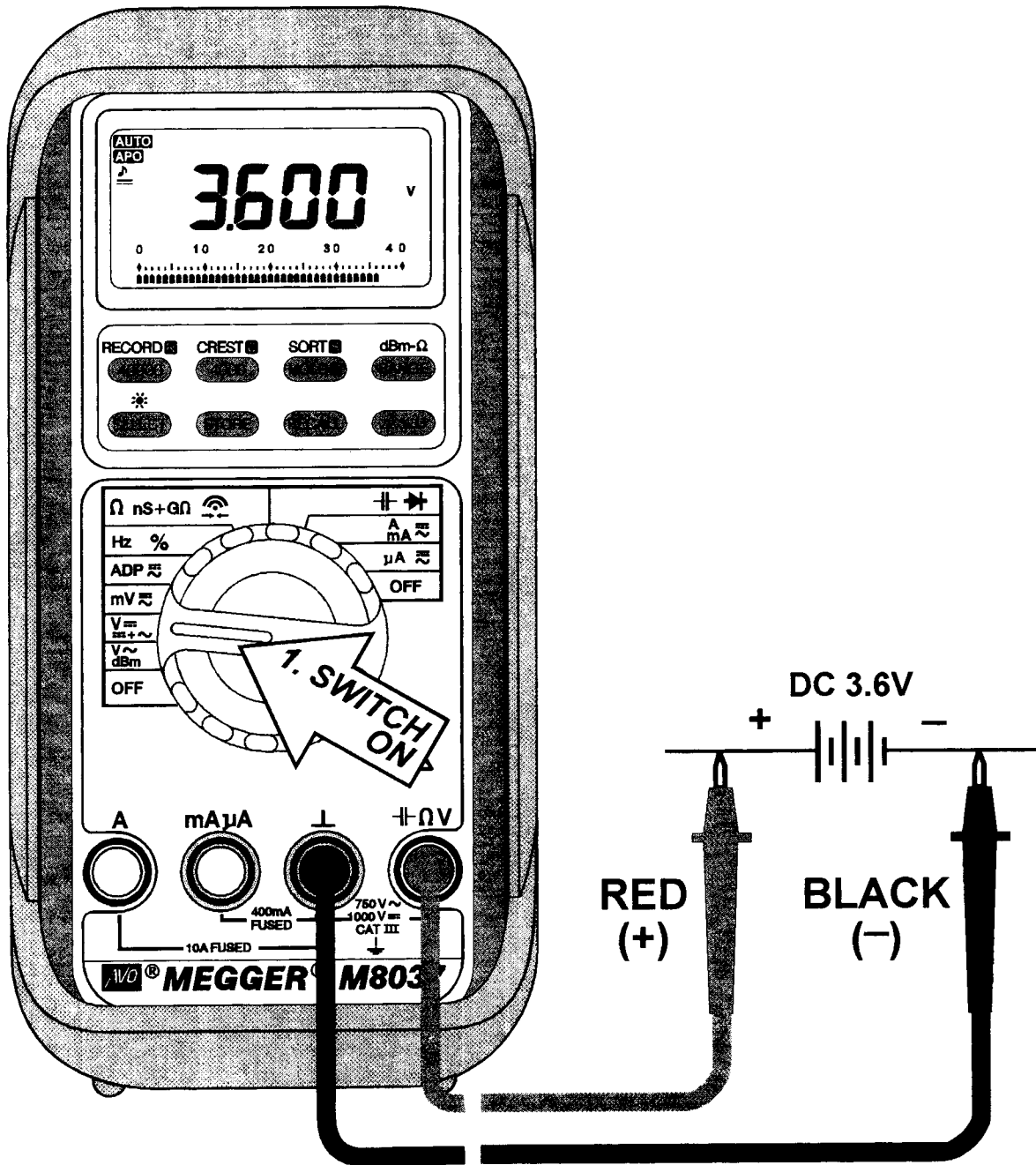
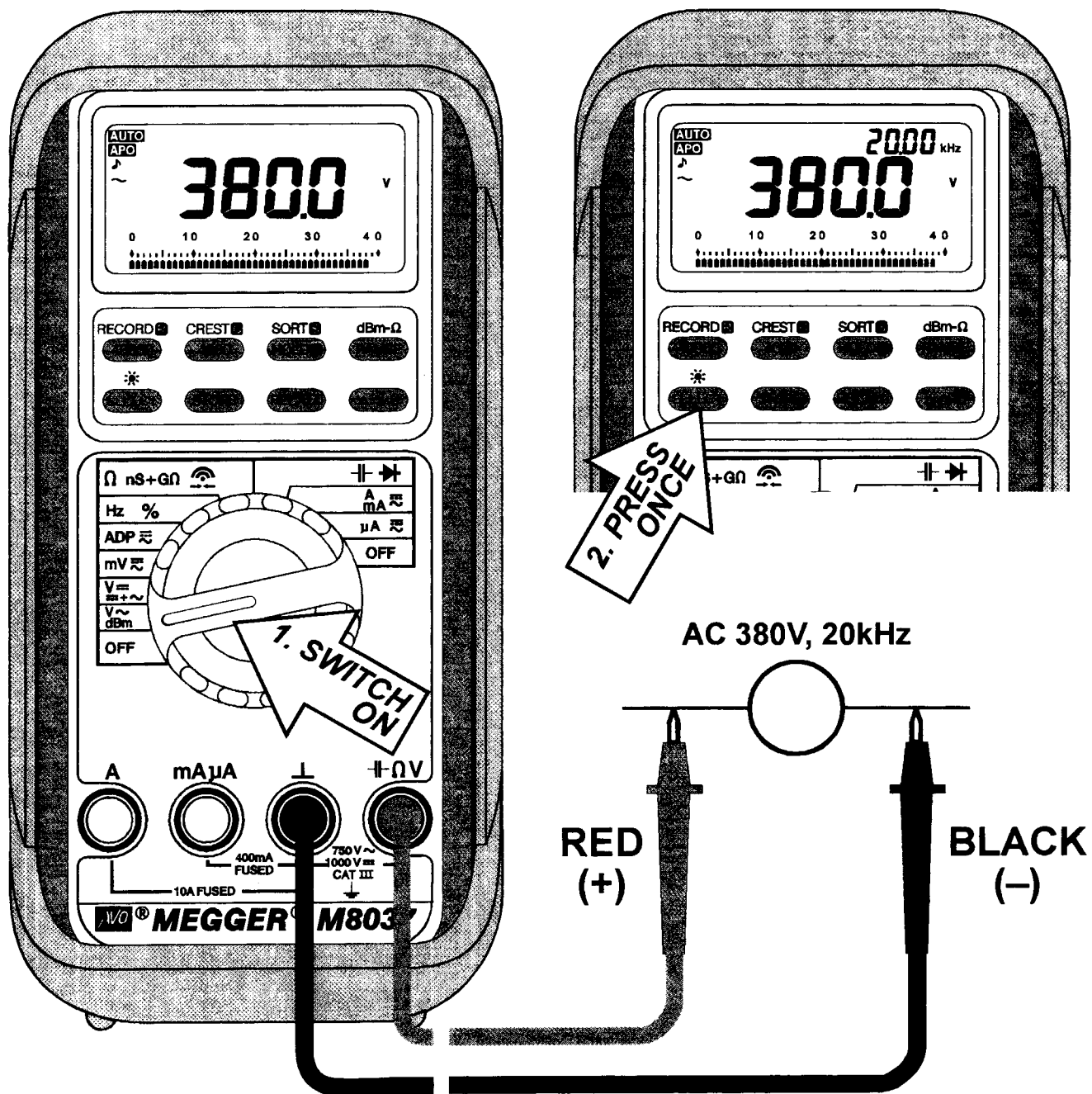


FIG 3. DC VOLTAGE FUNCTION

**(B) AC, AC + Hz VOLTAGE functions**

- 1) Set rotary switch to  $\tilde{V}$  position
- 2) Insert red (+) test lead into  $\Omega V \text{ Hz}$  jack and black (-) test lead into **COM** input jack
- 3) Connect test leads to voltage source and observe the digital display, see **FIG 4**
- 4) Default at **AC**. Press **SELECT** button momentary to select **ACV+Hz** in dual display if required



**FIG 4. AC, AC+Hz VOLTAGE FUNCTIONS**

**(C) DC, AC, AC+Hz mV functions**

- 1) Set rotary switch to  $\overline{\approx}$  mV position
- 2) Default at **DC**. Press **SELECT** button momentary to select **AC**, and press again to select **AC+Hz** in dual display if required
- 3) Insert red (+) test lead into  $\Omega$  V- $\overline{\approx}$  jack and black (–) test lead into **COM** input jack
- 4) Connect test leads to voltage source and observe the digital display, see **FIG 5**

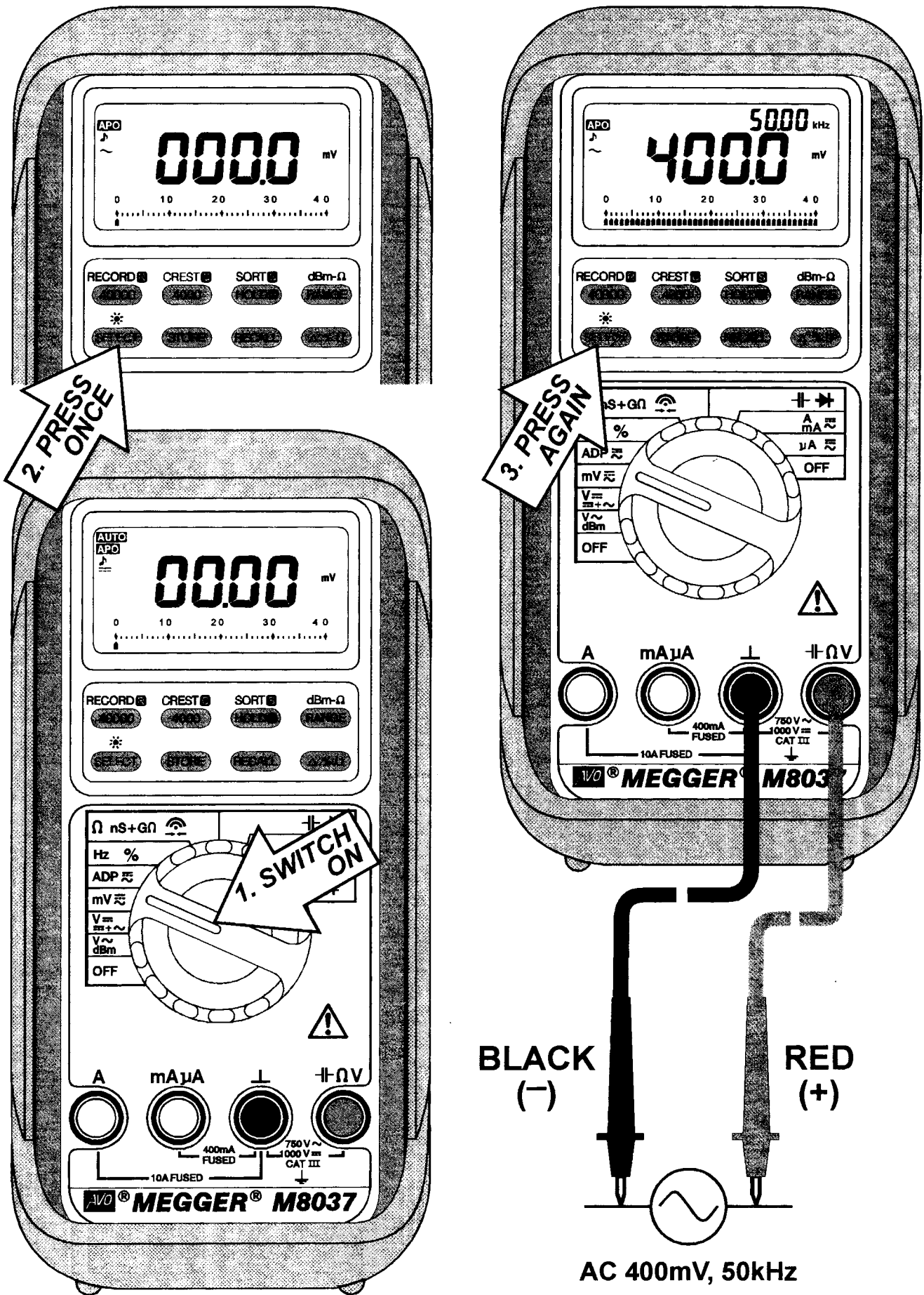


FIG 5. DC, AC, AC+Hz mV FUNCTIONS



**(D) DC+AC VOLTAGE function (M8037 only)**

- 1) Set rotary switch to  $\overline{\text{V}}$  position
- 2) Default at **DC**. Press **SELECT** button momentary to select to **DC+AC**
- 3) Insert red (+) test lead into  $\Omega V \text{---}$  jack and black (—) test lead into **COM** input jack
- 4) Connect test leads to voltage source and observe the digital display, see **FIG 6**

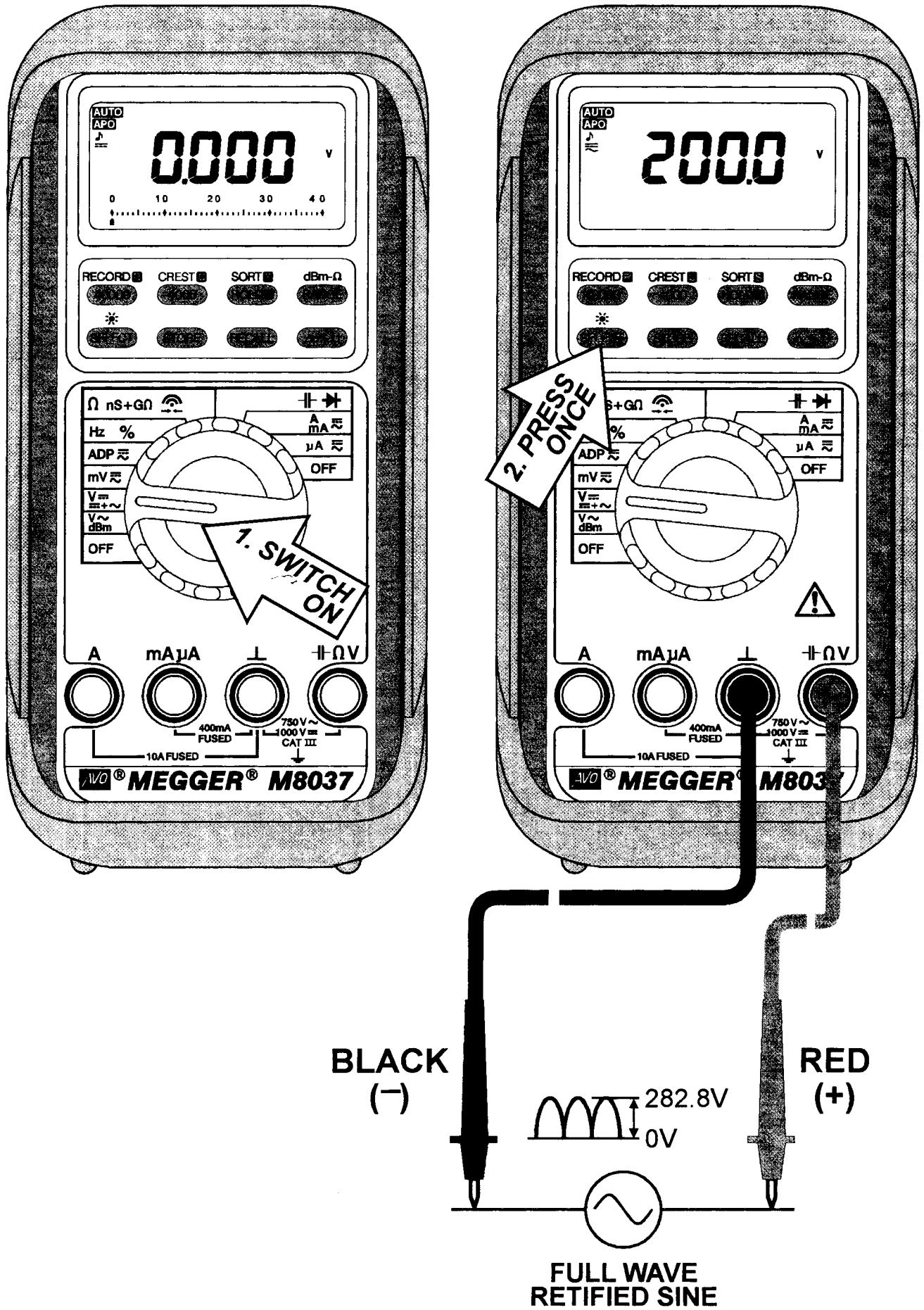


FIG 6. DC+AC VOLTAGE FUNCTION

**(E) dBm + Hz function (M8037 only)**

- 1) Set rotary switch to **dBm  $\tilde{V}$**  position
- 2) Default at **AC**. Press **SELECT** button momentary two times to select **dBm**. Default Reference impedance  $600\ \Omega$  will be displayed for 2 seconds before displaying the **dBm & Hz** readings
- 3) Press **dBm- $\Omega$  (RANGE)** button momentary to select different reference impedances from 4, 8, 16, 32, 50, 75, 93, 110, 125, 135, 150, 200, 250, 300, 500, 600, 800, 900, 1000, up to  $1200\ \Omega$ . Impedance values will again be displayed for 2 seconds before displaying the **dBm & Hz** readings
- 4) Insert red (+) test lead into  **$\Omega$  V- $\Omega$**  jack and black (—) test lead into **COM** input jack
- 5) Connect test leads to signal source and observe the digital display, see **FIG 7**

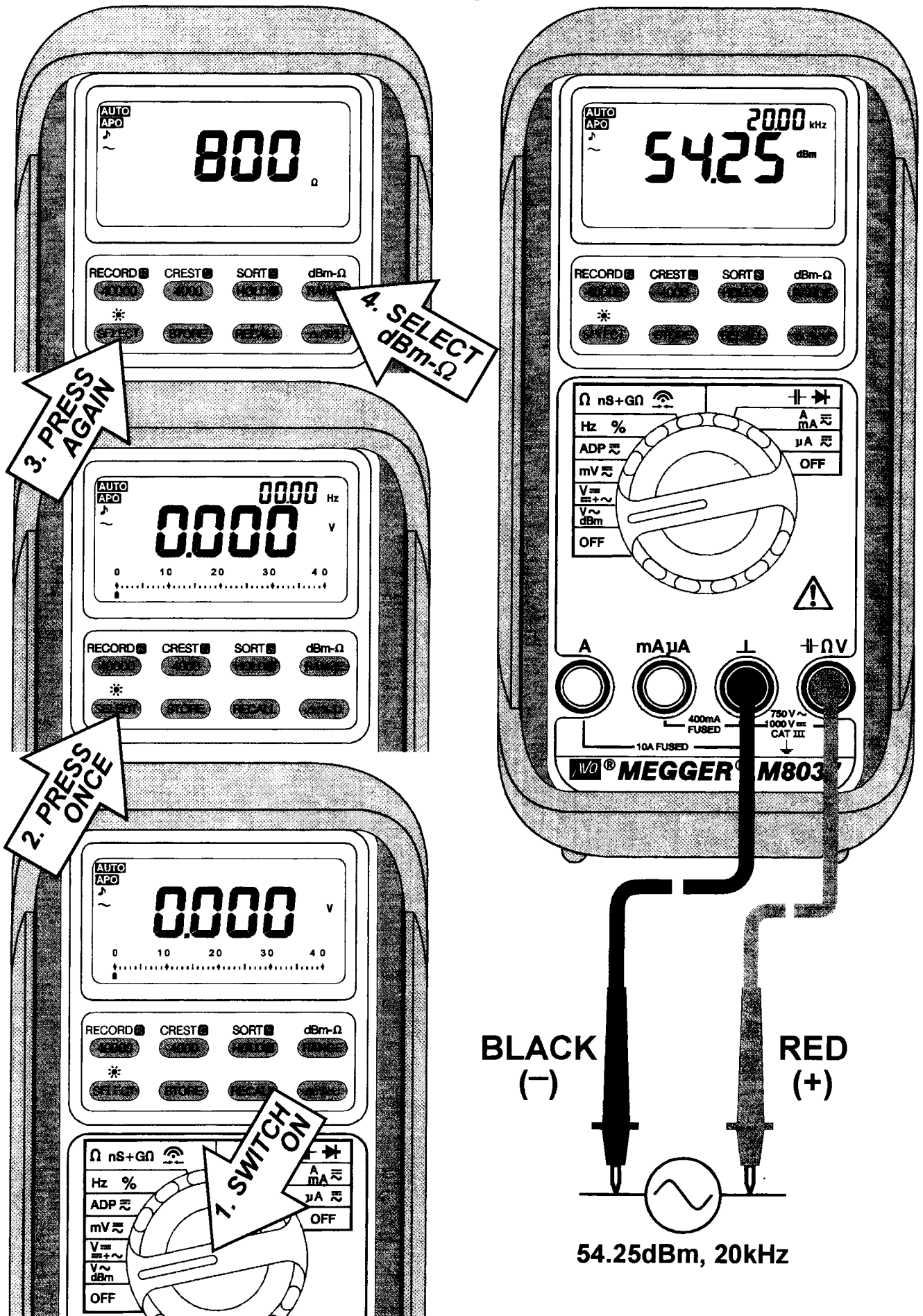



FIG 7. dBm+Hz FUNCTION

**(F) DC, AC, AC + Hz ADAPTOR functions**

- 1) Set rotary switch to  **ADP** position
- 2) Default at **DC**. Press **SELECT** button momentary to select **AC**, and press again to select **AC+Hz** in dual display if required
- 3) Insert output plug of the adaptor with positive (+) into  **$\Omega V \text{---}$**  jack and the negative (–) into **COM** input jack, see **FIG 8**
- 4) The digital display defaults at 10 counts per mV, and can be extended to 100 counts per mV in 40,000 counts mode
- 5) The extra high input impedance of 1000 M $\Omega$  makes the **ADP** function possible to cope with most voltage output adaptors available in stores. For current clamp adaptor with output 1mV per Ampere, 2000 counts on the digital display represents 200 Ampere. For temperature adaptor with output 1mV per degree, 2000 counts represents 200 degree

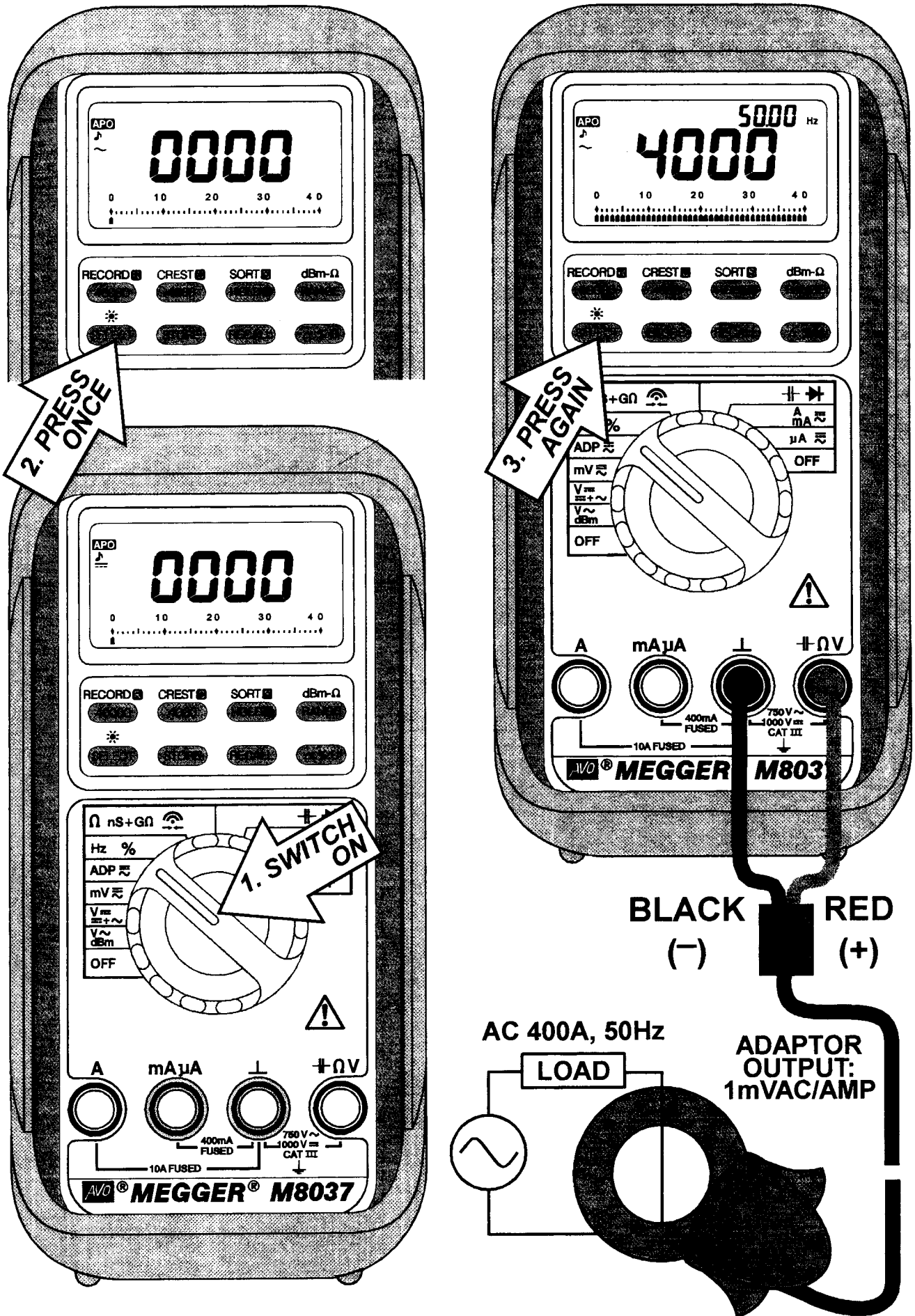
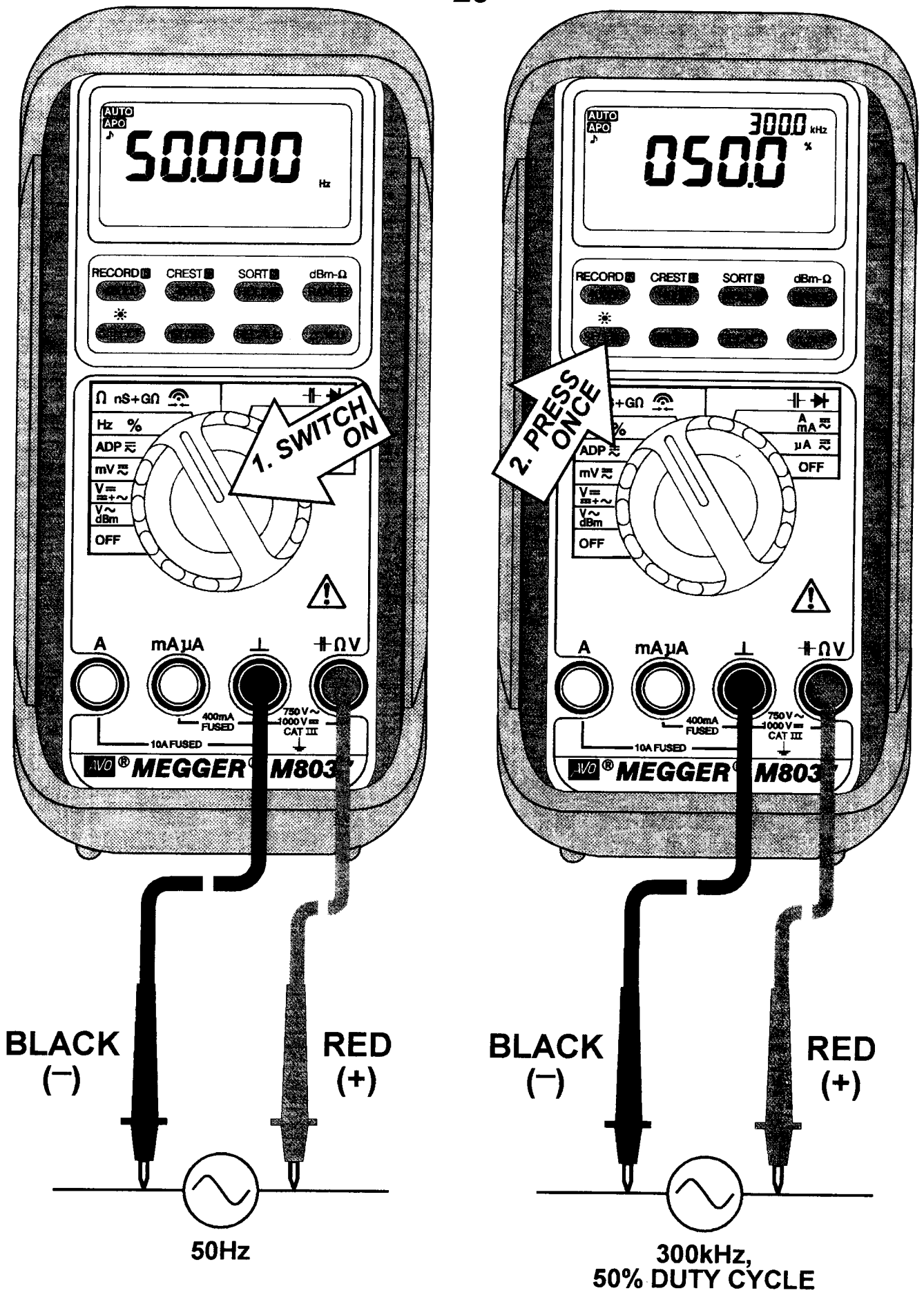


FIG 8. DC, AC, AC+Hz ADAPTOR FUNCTIONS

**(G) Hz, %+Hz (M8037 only) functions**

- 1) Set rotary switch to %Hz
- 2) Insert red (+) test lead into  $\Omega V \text{---}$  jack and black (—) test lead into **COM** input jack
- 3) Connect test leads to signal source and observe the digital display, see **FIG 9**
- 4) Default at Hz. Press **SELECT** button momentary to select %+Hz in dual display (M8037 only)



**FIG 9. Hz, %+Hz FUNCTIONS**



**(H)  $\Omega$  RESISTANCE, nS + G $\Omega$  CONDUCTANCE**

- 1) Set rotary switch to **nS+G $\Omega$   $\Omega$**
- 2) Insert red (+) test lead into  **$\Omega$ V-~~H~~** jack and black (-) test lead into **COM** input jack
- 3) Connect the test leads as shown in **FIG 10** and observe the digital display
- 4) Default at  **$\Omega$** . Press **SELECT** button momentary to select **nS+G $\Omega$**  in dual display for resistance measurements beyond 40M $\Omega$

**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

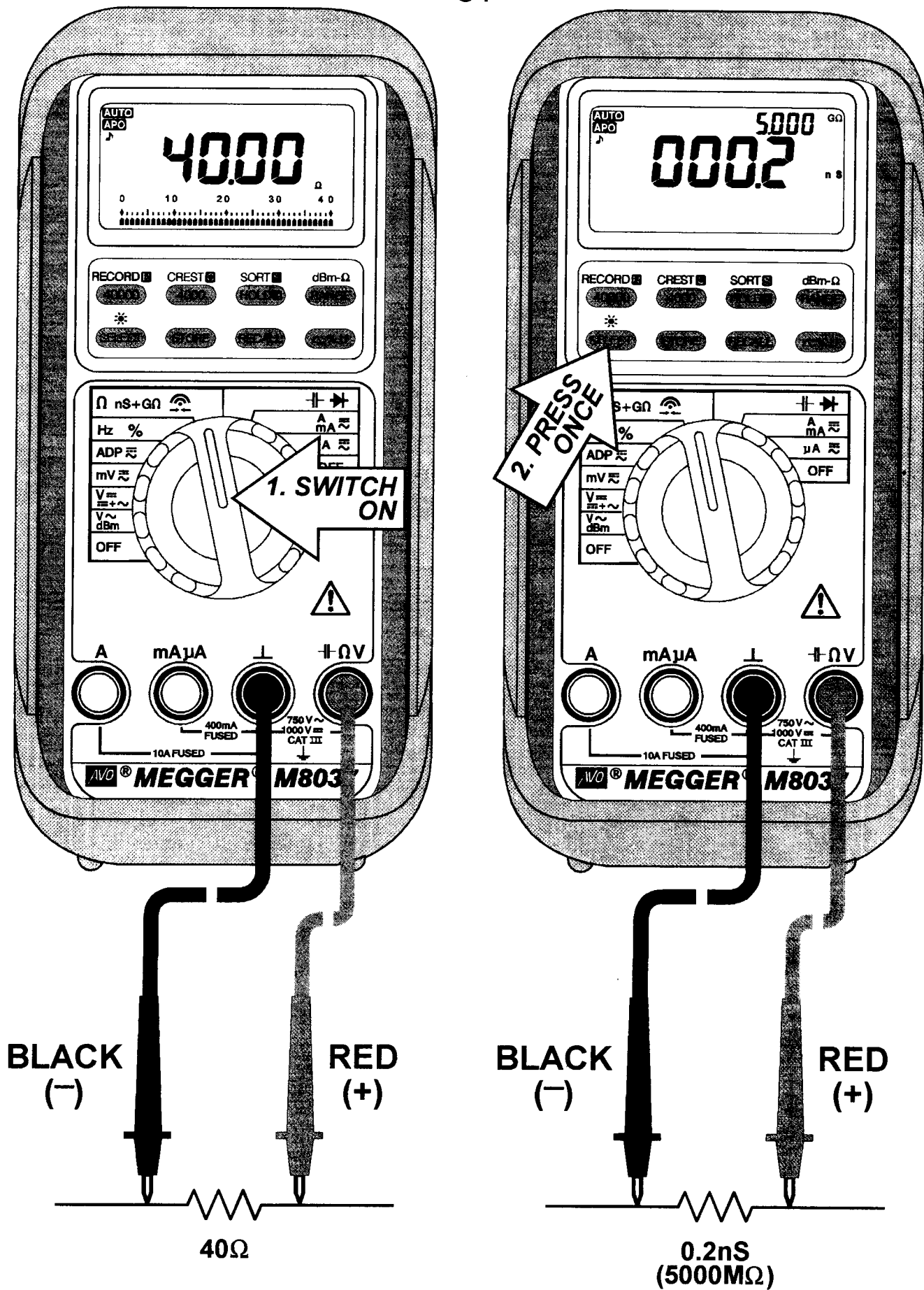


FIG 10. Ω, nS+GΩ FUNCTIONS

( I ) •))) **AUDIBLE CONTINUITY function**

- 1) Set rotary switch to •))) nS+GΩ Ω
- 2) Default at Ω . Press **SELECT** button momentary two times to select •))) audible continuity function
- 3) Insert red (+) test lead into ΩV-⊣ jack and black (—) test lead into **COM** input jack
- 4) Connect the test leads to the end points of wire as shown in **FIG 11**
- 5) A continuous beep tone indicates a complete wire. This is useful for checking wiring connections and operation of switches

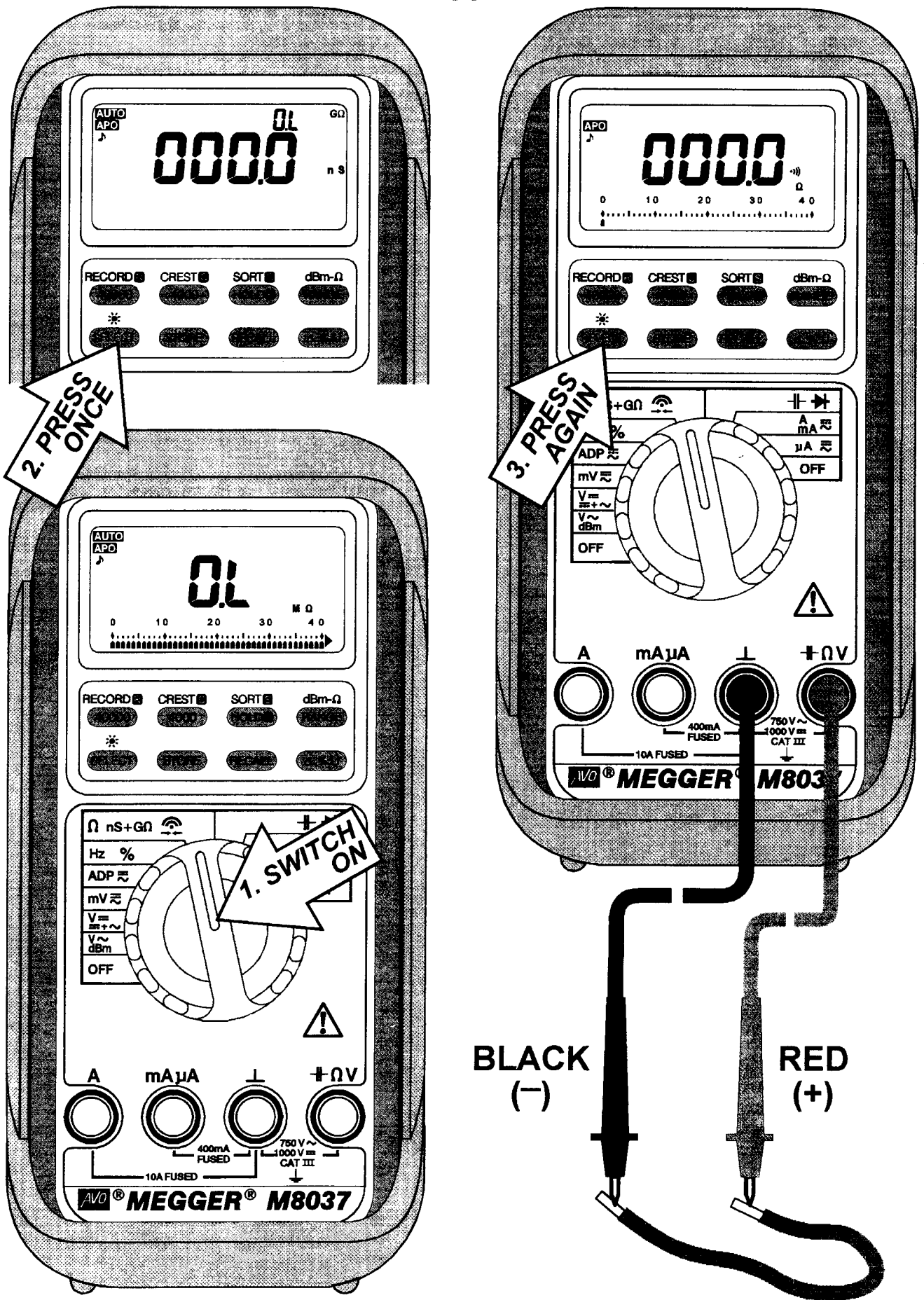


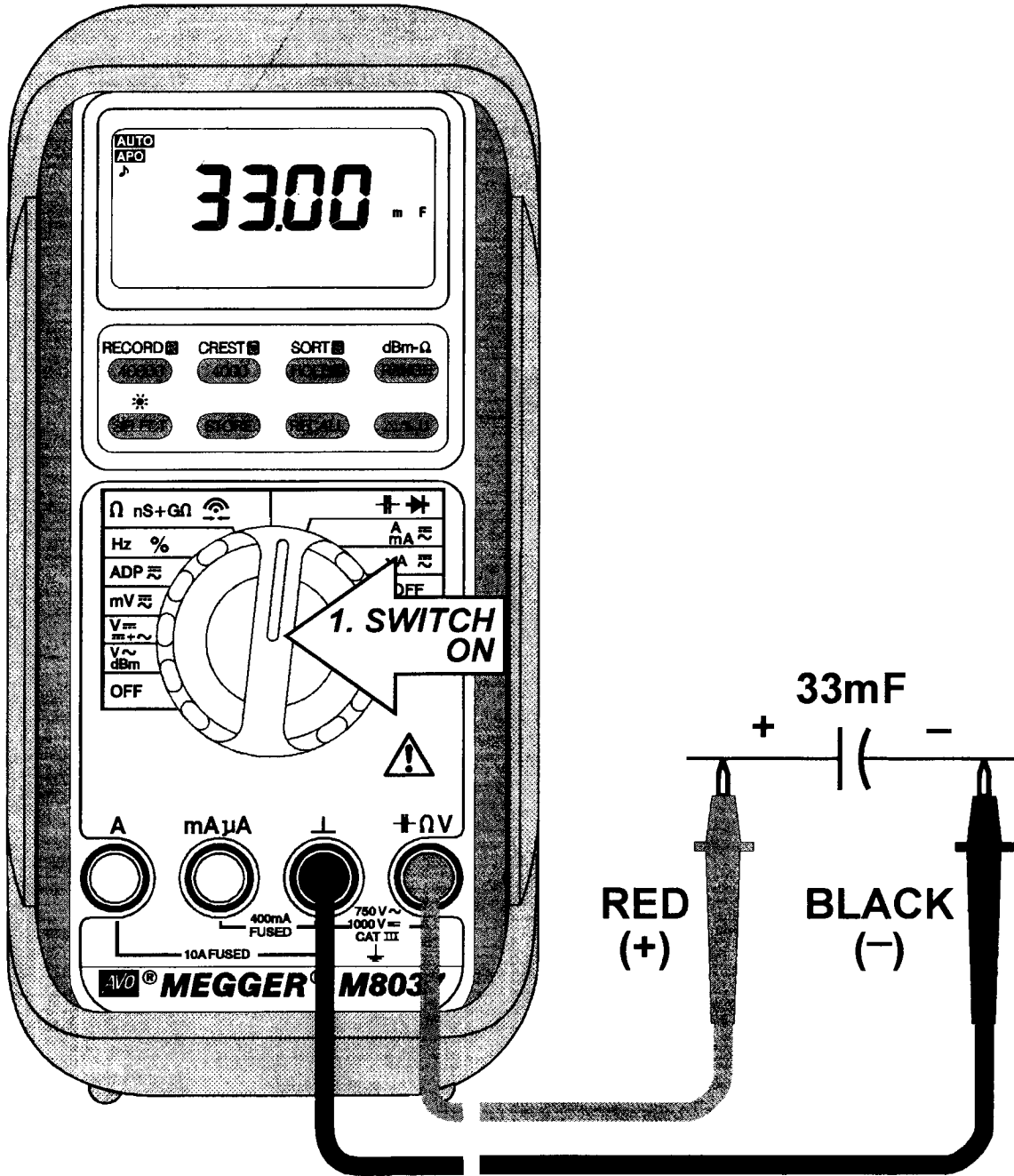
FIG 11.  $\text{⦿}$  AUDIBLE CONTINUITY FUNCTION

**(J)  $\text{--}\text{||}\text{--}$  CAPACITANCE function**

- 1) Set rotary switch to  $\text{--}\text{||}\text{--}\text{--}\text{||}\text{--}$
- 2) Insert red (+) test lead into  $\Omega\text{V}\text{--}\text{||}\text{--}$  jack and black (–) test lead into **COM** input jack
- 3) Connect the test leads as shown in **FIG 12** and observe the digital display





**CAUTION**

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



**FIG 12.  $\mu$ F CAPACITANCE FUNCTION**

**(K)  DIODE TEST function**

- 1) Set rotary switch to 
- 2) Default at  Capacitance. Press **SELECT** button momentary to select  diode test
- 3) Insert red (+) test lead into  $\Omega V$  jack and black (—) test lead into **COM** input jack
- 4) Connect the test leads as shown in **FIG 13** and observe the digital display
- 5) 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)
- 6) Reverse the test leads connections (reverse biased) across the diode
- 7) The digital display shows OL if the diode is good. Any other readings indicate the diode is resistive or shorted (defective)

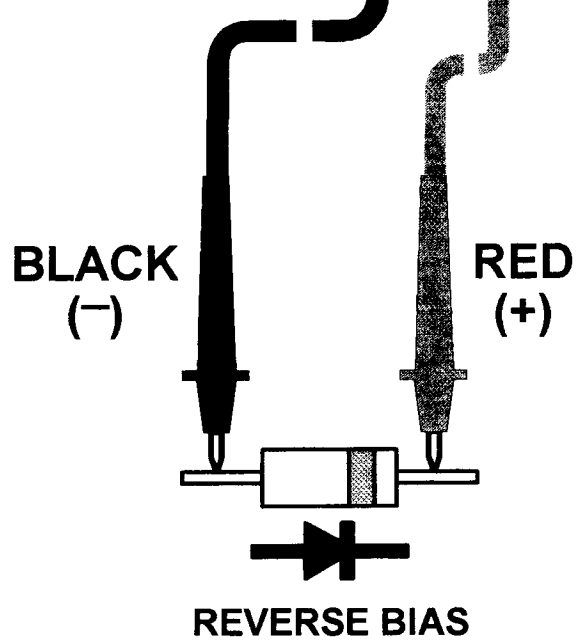
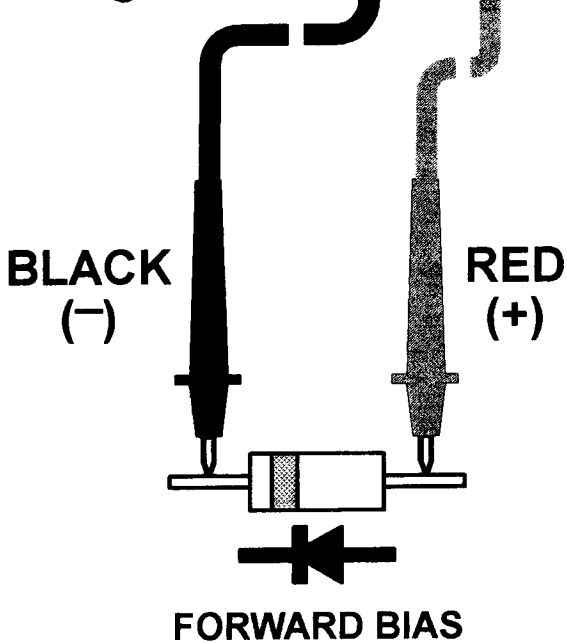
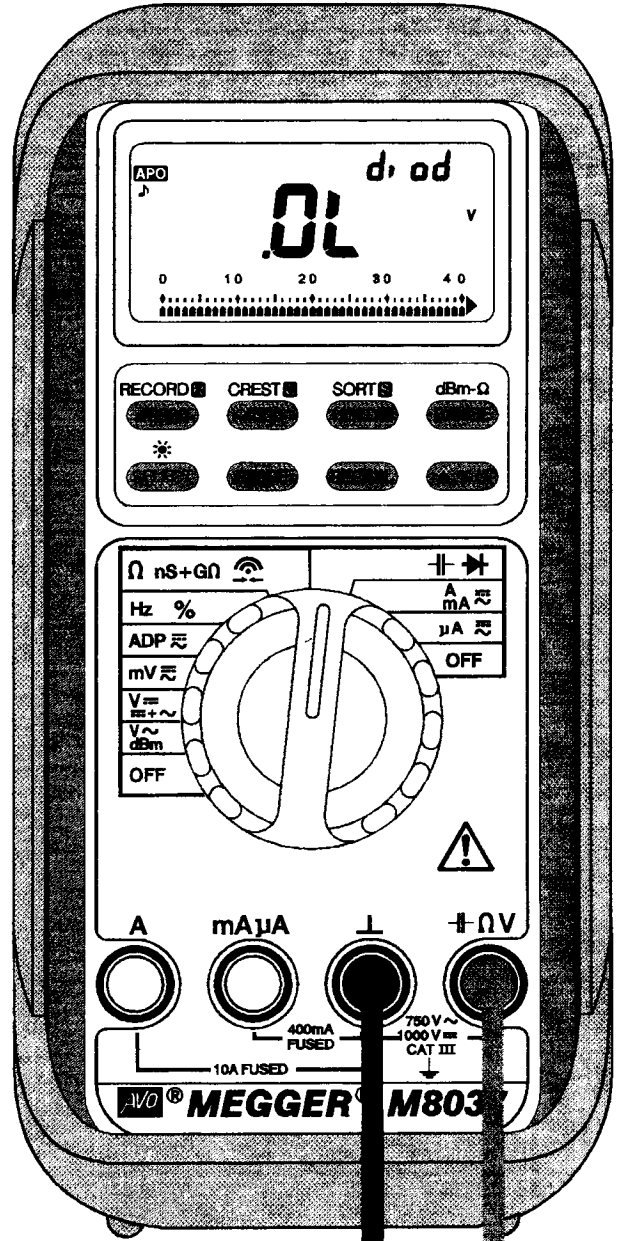
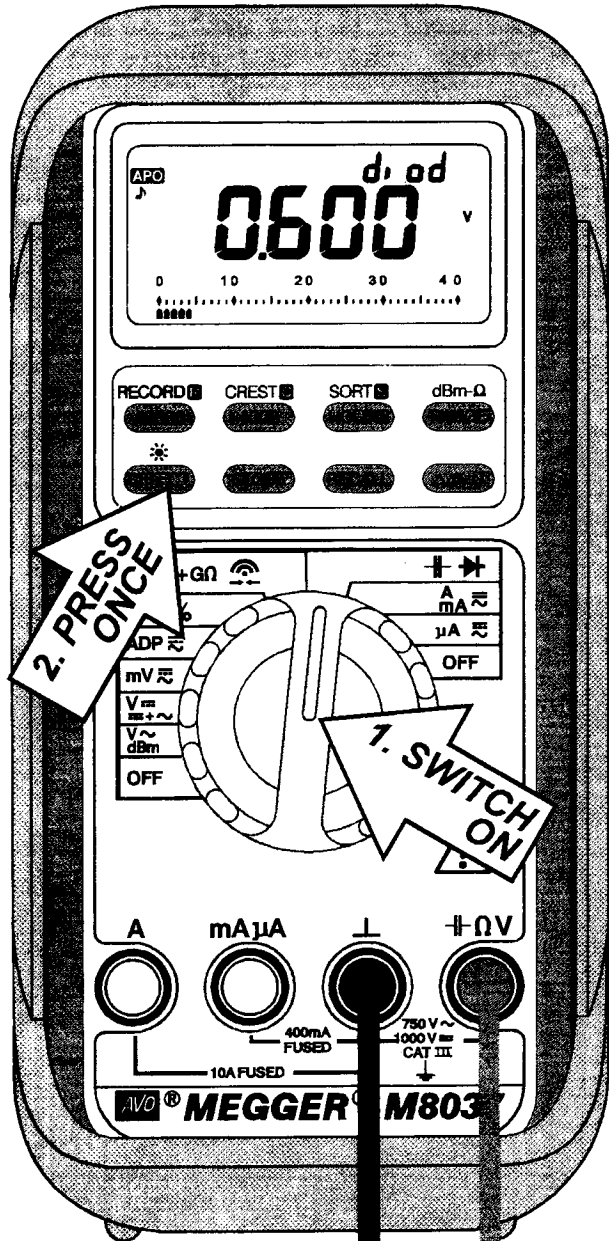


FIG 13. ➔ DIODE TEST FUNCTION



**(L) DC, AC, AC + Hz of  $\mu\text{A}$ , mA or A functions**

- 1) Set rotary switch to **A mA** or  **$\mu\text{A}$**
- 2) Insert red (+) test lead into **mA  $\mu\text{A}$**  jack and black (–) test lead into **COM** input jack for current measurements below 400mA, see **FIG 14**; and Insert red (+) test lead into **A** jack and black (–) test lead into **COM** input jack for currents measurements up to 10A, see **FIG 15**. mA or A ranges will be selected automatically after plug in
- 3) Default at **DC**. Press **SELECT** button momentary to select **AC**, and press again to select **AC+Hz** in dual display if required
- 4) Connect the test leads as shown in **FIG 14** or **FIG 15** and observe the digital display

**WARNING**

Do not measure any circuit that draws more than the current ratings of the protection fuses. If the fuse blows, you might be injured or damage the meter. Do not attempt a current measurement where the open circuit voltage is above 500V for mA  $\mu\text{A}$  jack; and 600v for A jack. Suspected open circuit voltage must be checked with voltage functions

Voltage output current clamp adaptors are recommended to use with the meter adaptor or voltage functions for making high current measurements

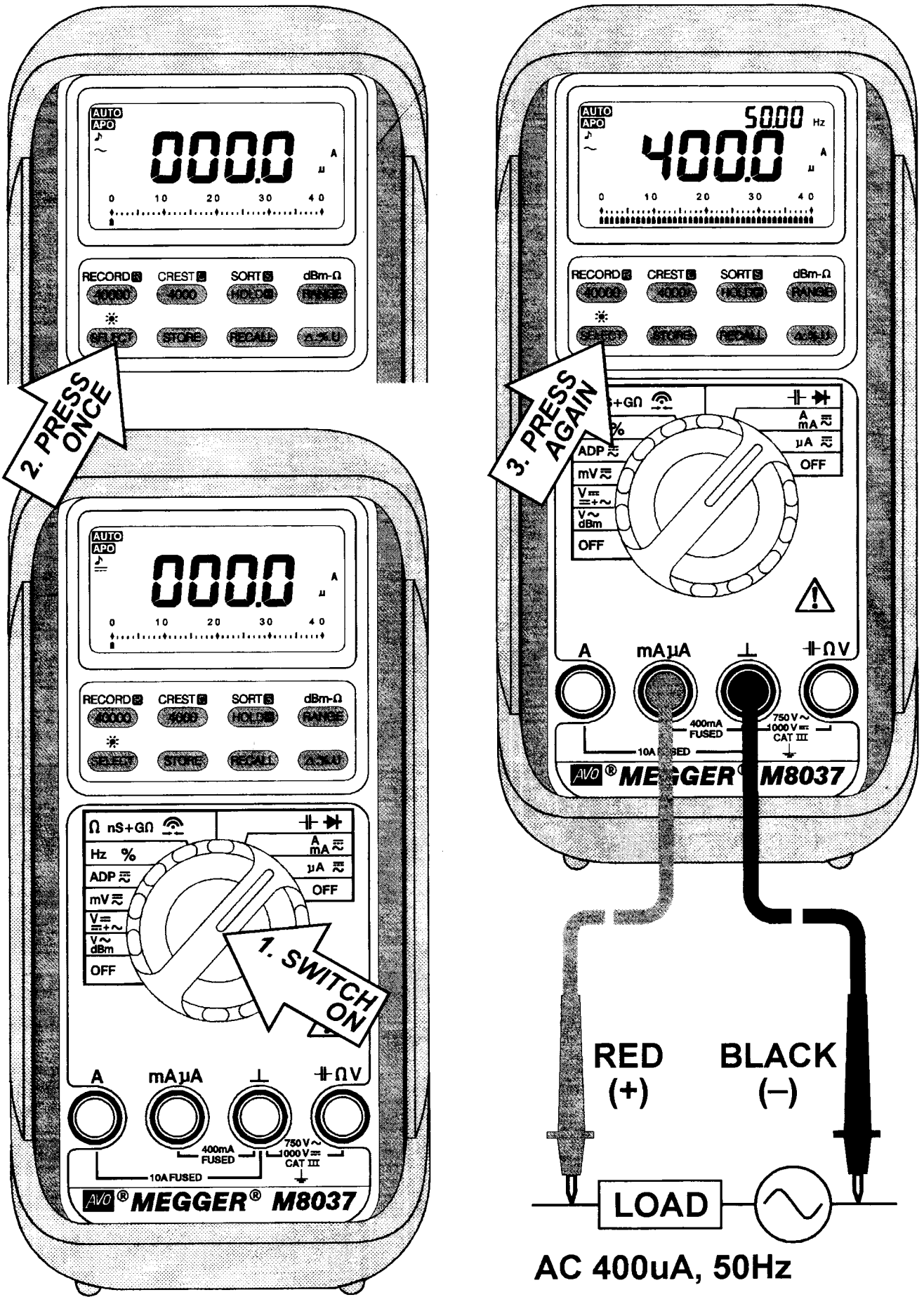


FIG 14.  $\mu$ A, mA FUNCTION

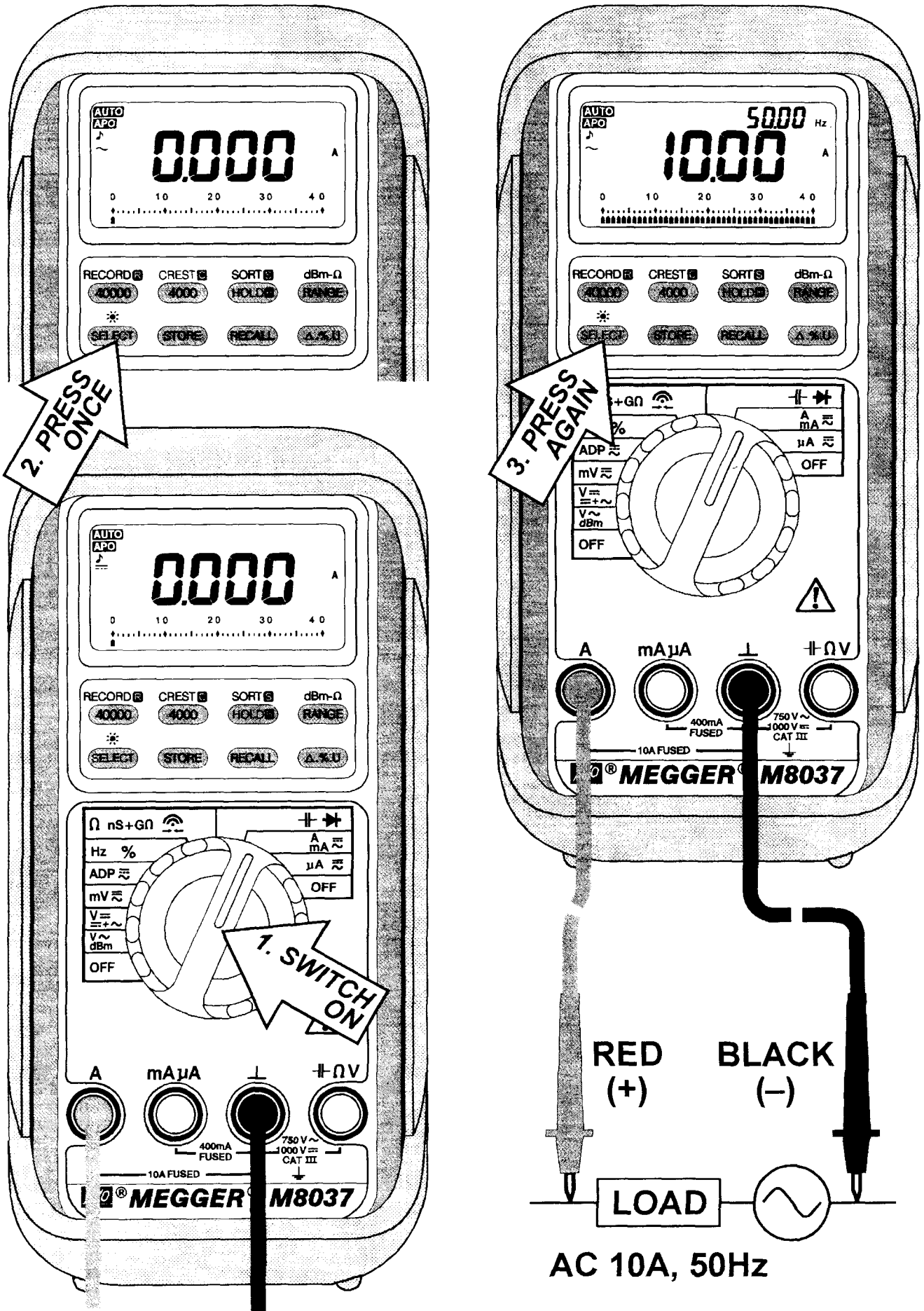


FIG 15. A FUNCTION

	DATA HOLD	RANGE LOCK	40,000 COUNTS	RELATIVE $\Delta$ .%.U	RECORD *	CREST *	SORT™ *	DUAL DISPLAY	STORE RECALL
DC VOLTAGE	•	•	•	•	•	•	•		•
AC VOLTAGE	•	•	•	•	•	•	•	•	•
DC+AC VOLTAGE	•	•	•	•	•	•	•		•
DC CURRENT	•	•	•	•	•	•	•		•
AC CURRENT	•	•	•	•	•	•	•	•	•
RESISTANCE	•	•	•	•	•	•	•		•
CONDUCTANCE	•		•					•	•
FREQUENCY	•								•
DUTY CYCLE	•							•	•
CAPACITANCE	•	•		•	•	•	•		•
ADAPTOR	•		•	•	•	•	•	•	•
dBm	•		•	•				•	•
CONTINUITY	•		•						•
DIODE	•								•

\*Note: RECORD, CREST & SORT™ features are NOT available in Dual Display mode

TABLE 3. FEATURE AVAILABILITY SUMMARY

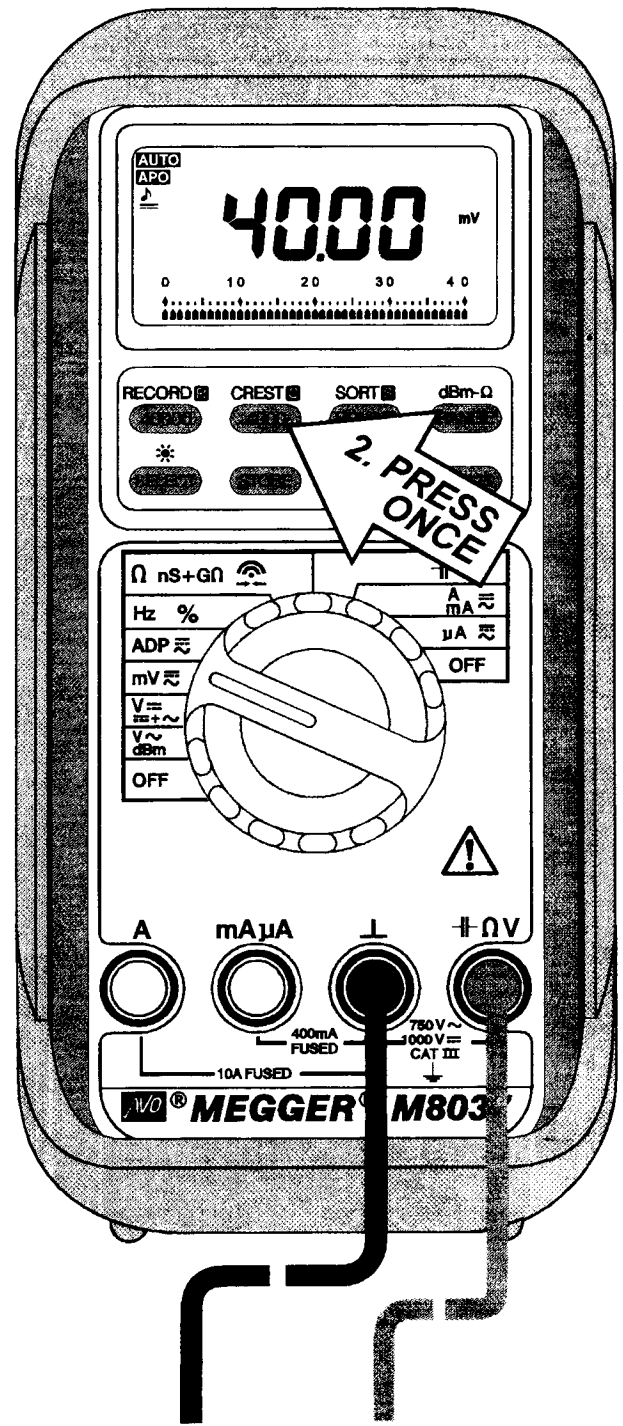
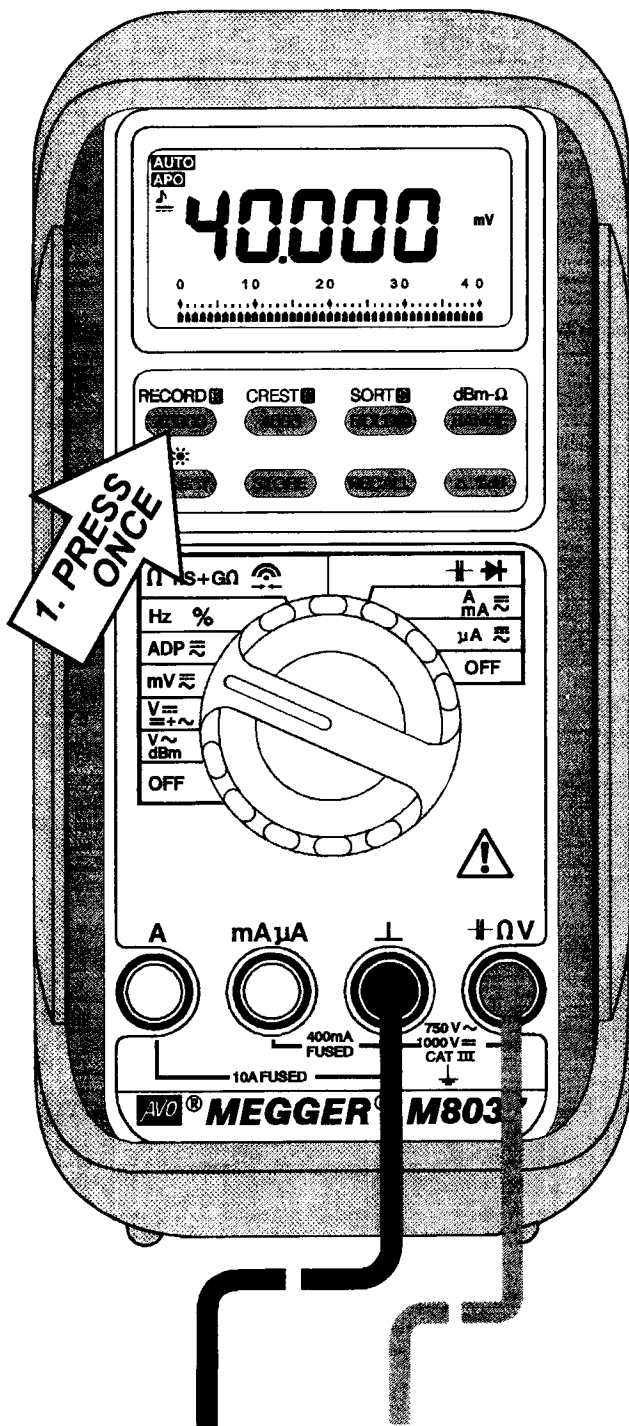
## V) ADVANCED OPERATION

Note : See TABLE 3 for features availability

### (A) 40,000 COUNTS HIGH RESOLUTION SLOW MODE

Press the <sup>RECORD</sup><sub>40000</sub> button momentary to enter the 4-3/4 digit high resolution slow mode with a maximum display at 40,000 counts. Press the <sup>CREST</sup><sub>4000</sub> button momentary to return to 3-3/4 digit fast mode. See **FIG 16**. The 4-3/4 digit mode is available in all functions except Frequency, Duty Cycle, Capacitance and Diode Test

In 3-3/4 digit fast mode, the digital display updates 5 times per second nominal to give you the maximum measuring speed. In 4-3/4 digit slow mode, the digit display updates 1.25 times per second nominal to give you smooth readings as well as the full accuracy of the meter






**PRESS MOMENTARY  
TO SELECT 4-3/4 DIGITS  
40,000 COUNTS SLOW MODE**



**PRESS MOMENTARY  
TO SELECT 3-3/4 DIGITS  
4,000 COUNTS FAST MODE**

**FIG 16. 40,000 COUNTS HIGH RESOLUTION SLOW MODE**

## (B) HOLD




Press the   button momentary to activate the hold function with LCD annunciator  turns on. Press momentary again to release. See **FIG 17**. When in normal measuring modes, the hold feature freezes the display for later view

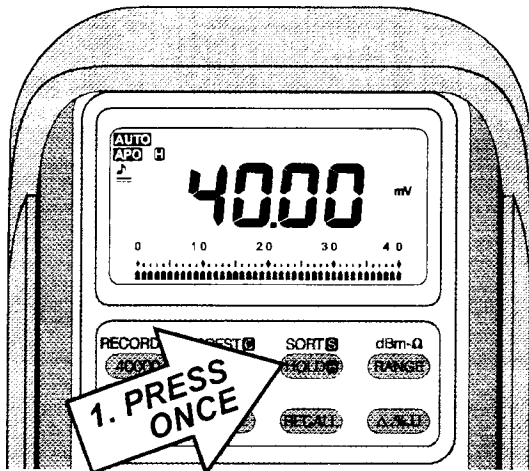
## (C) MANUAL OR AUTO RANGING

Press the  button momentary to select manual-ranging, and the meter will remain in the range it was in with LCD annunciator  turns off. Press the button momentary again to step through the ranges. Press and hold the button for 1 second or more to resume auto-ranging. See **FIG 18**

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

## (D) DATA STORE & RECALL

Press the  button momentary to store the displaying information. The LCD annunciator **MEM** blinks two times to confirm storage. Press the  button momentary to recall the stored data with LCD annunciator **MEM** turns on. See **FIG 19**. Press any other buttons EXCEPT  to resume measurements. This feature stores the whole display data in memory for later recall. The memory will remain even in auto-power-off mode, and can also be recalled while you are in another meter function. The memory will be erased if the rotary switch is switched to the OFF position

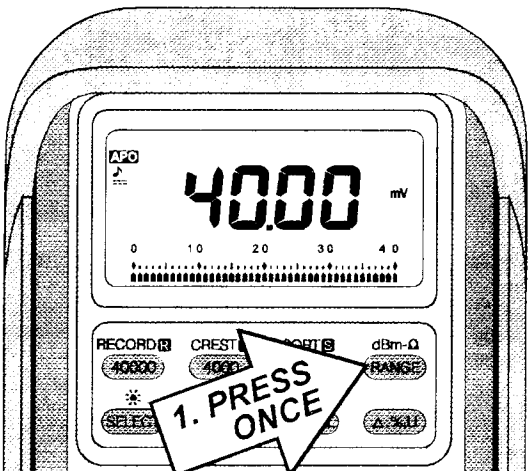


**PRESS MOMENTARY  
TO ACTIVATE HOLD**

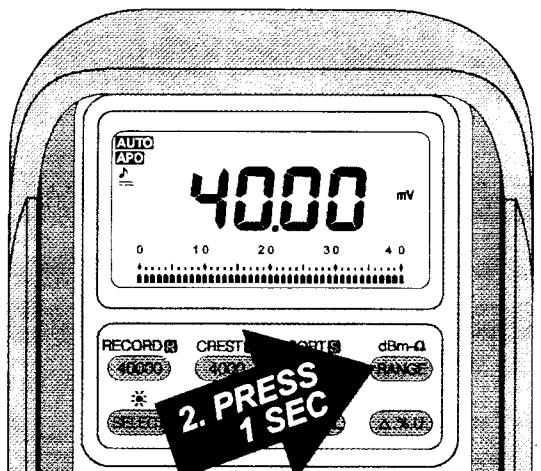


**PRESS MOMENTARY  
AGAIN TO EXIT HOLD**

**FIG 17. HOLD FUNCTION**

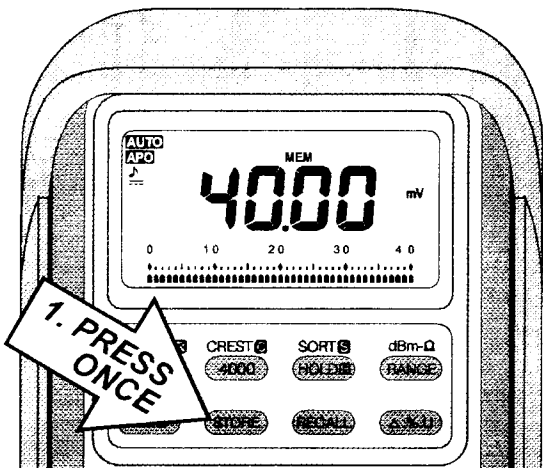


**PRESS MOMENTARY  
TO SELECT MANUAL RANGING**

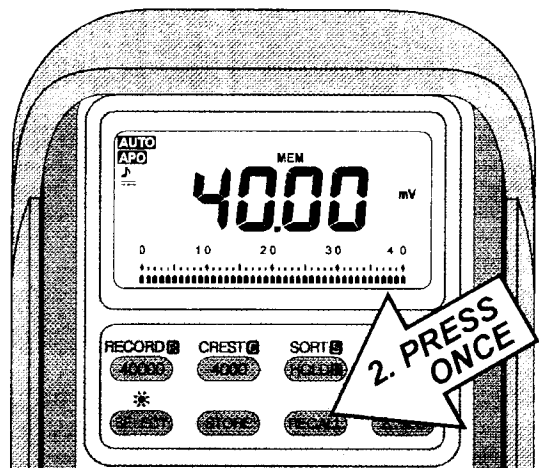


**PRESS 1 SECOND  
TO RESUME AUTO RANGING**

**FIG 18. MANUAL OR AUTO RANGING**



**PRESS MOMENTARY  
TO STORE DATA**



**PRESS MOMENTARY  
TO RECALL DATA**

**FIG 19. DATA STORE & RECALL**



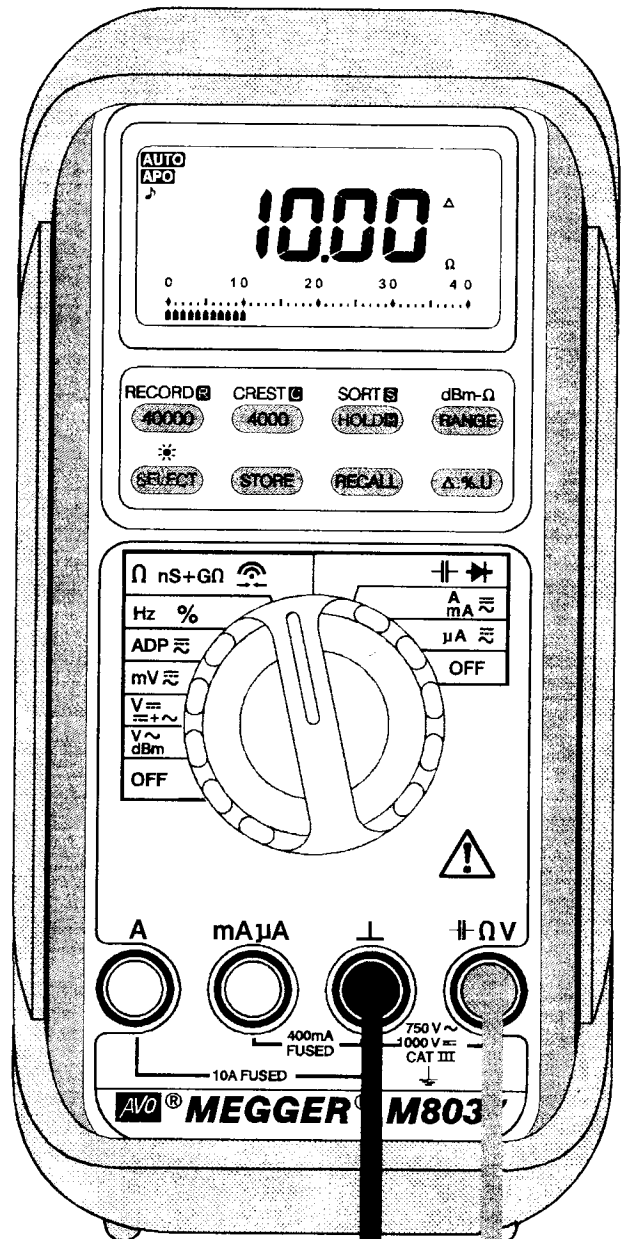
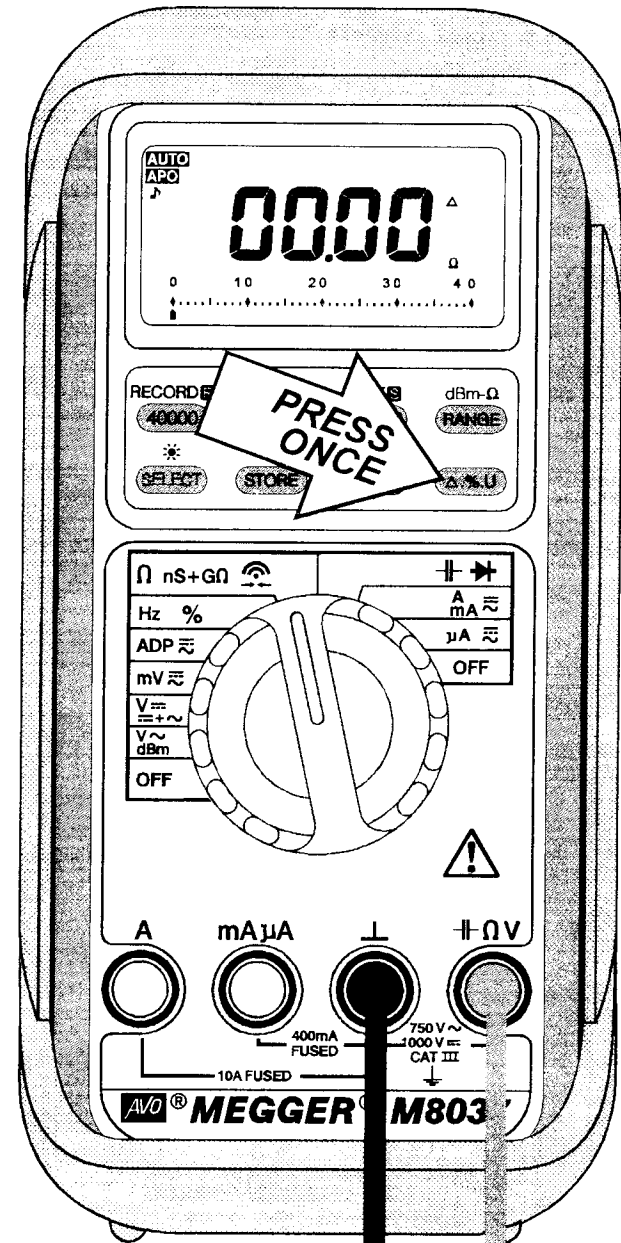
**(E) RELATIVE MODES  $\Delta$ .%.UNIT**

Press the  $\Delta$ .%.U button momentary to enter the Relative Zero ( $\Delta$ ) mode with LCD annunciator  $\Delta$  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 or SORT™ functions. See **FIG 20a**

Press the  $\Delta$ .%.U button momentary again to enter the Relative Percentage Change (%) mode with LCD annunciators  $\Delta$ % turn on. In this mode, the readings show relative percentage changes, and the bar graph automatically indicates  $+ / - 200\%$ , or  $+ / - 20\%$  full scale changes with respect to the relative reference value as center zero point. It simplifies zero, peaking, nulling measurements, and is excellent for fine adjustments. See **FIG 20b**

Press the  $\Delta$ .%.U button momentary again to enter the Relative Per Unit (U) mode with LCD annunciators  $\Delta$  **UNIT** turn on. This is a unique feature to show the ratio of measuring values to the relative base value. The relative base value is considered to be one unit, and the consecutive measurements will be displayed in terms of units. Measuring the parallel capacitance of co-axial cable or parallel wire in conjunction with the relative per unit mode, for example, helps estimating the total cable length or locating cable breakage locations. See **FIG 20c**

Press and hold the  $\Delta$ .%.U button for 1 second or more to exist relative modes and resume normal measurements



BLACK (-)

RED (+)

20Ω

BLACK (-)

RED (+)

30Ω

FIG 20a. RELATIVE ZERO ( $\Delta$ )

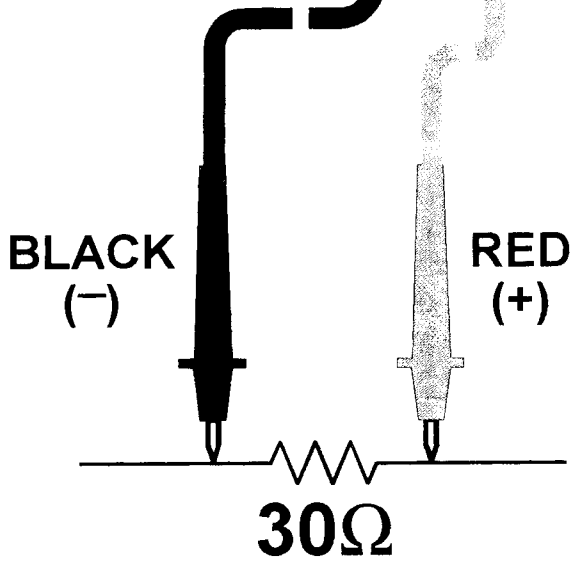
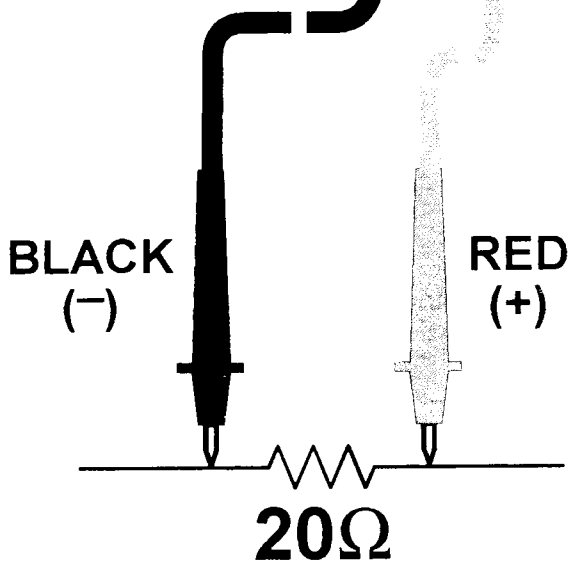
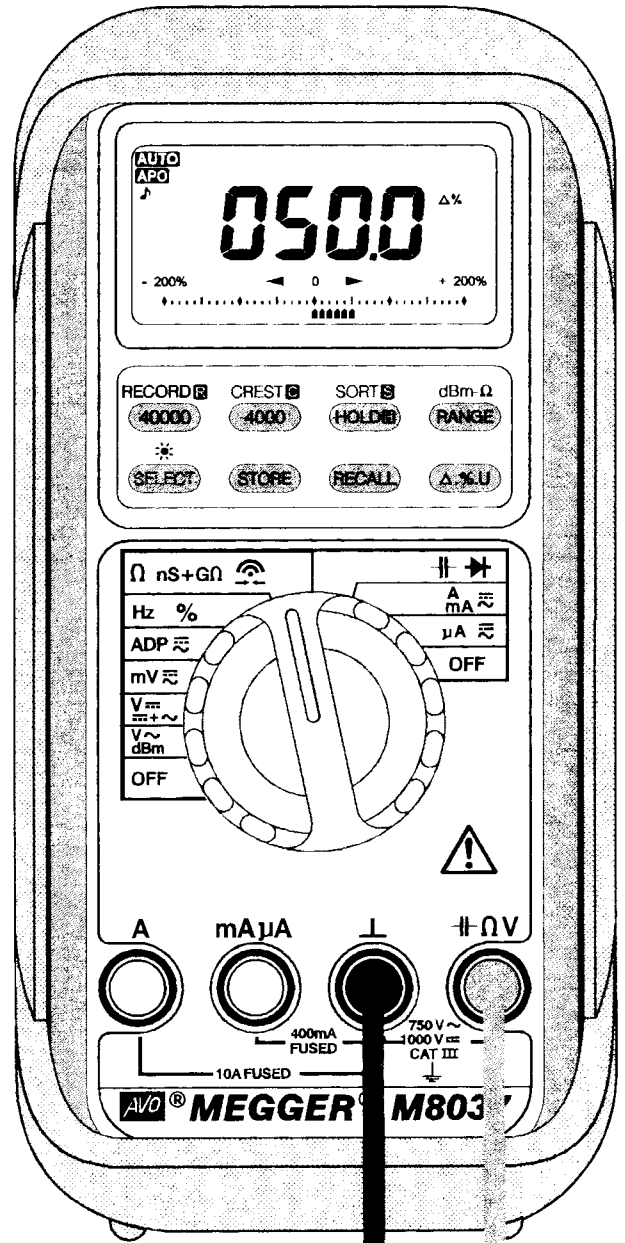
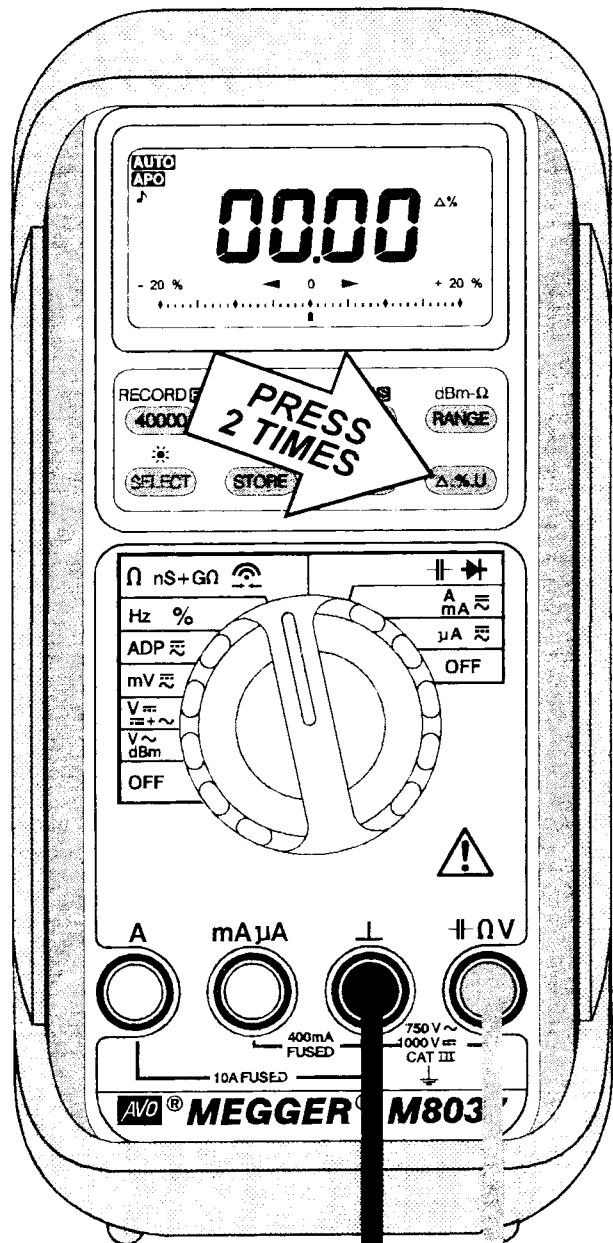
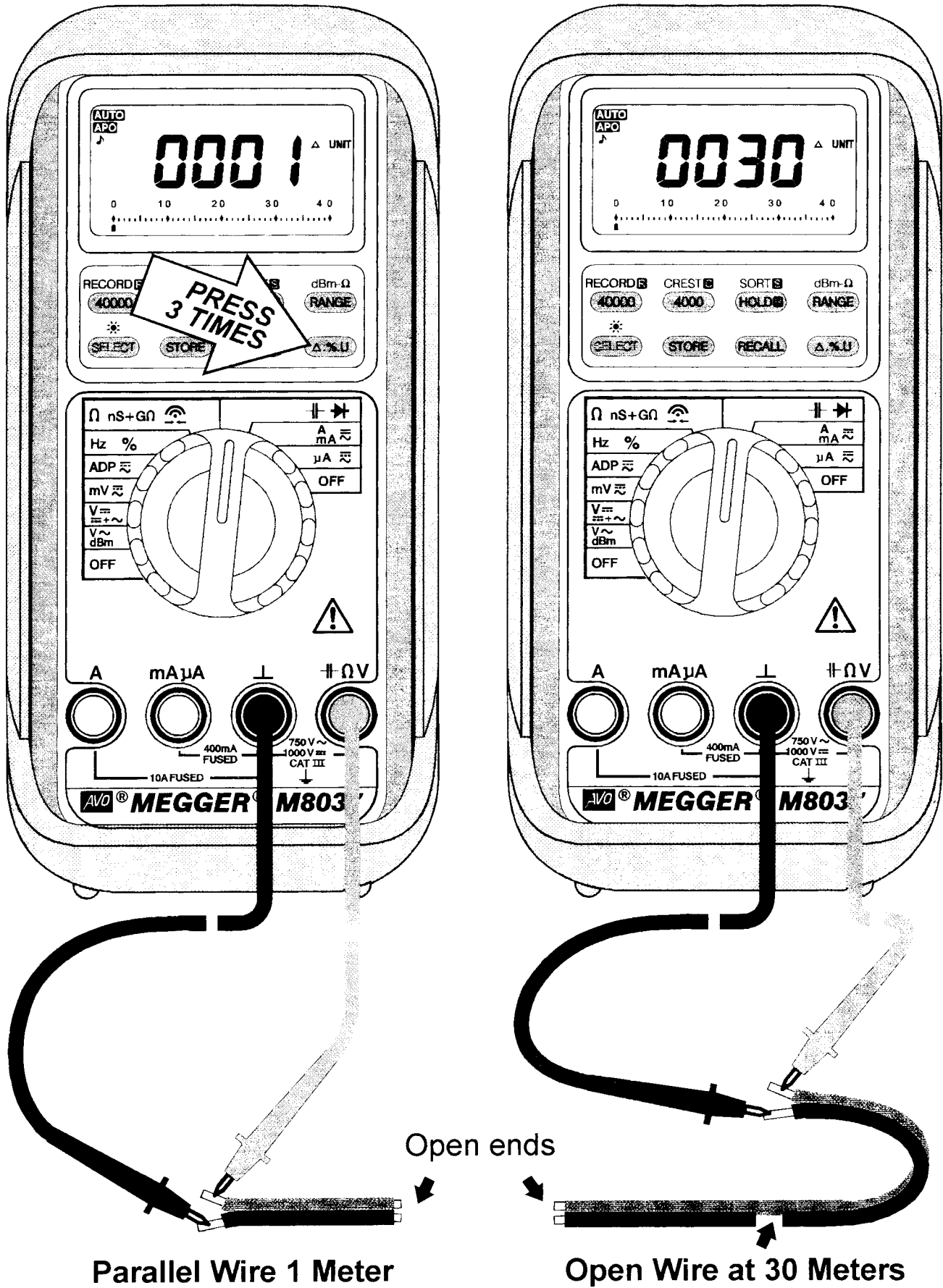





FIG 20b. RELATIVE PERCENTAGE CHANGE (%)




NOTE: Test lead capacitance may affect the accuracy of this application. Lead length should be as short as possible

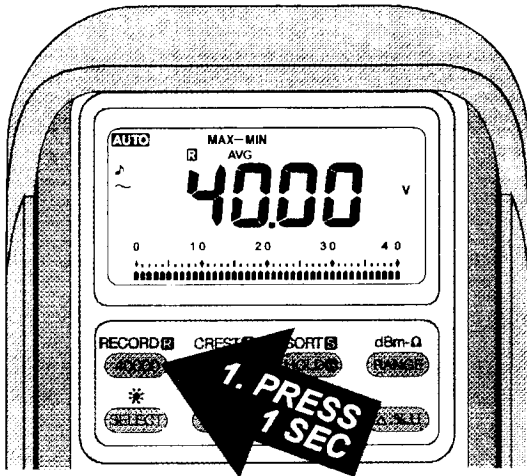
FIG 20c. RELATIVE PER UNIT ( U )

## (F) RECORD MODE

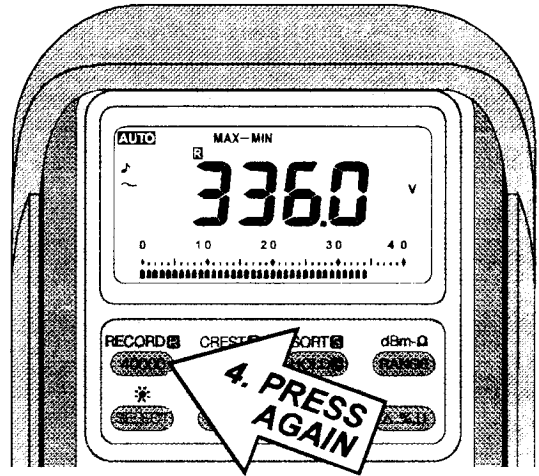
Perform measurements as described in BASIC OPERATION. Press and hold the  button for 1 second or more to activate RECORD mode with LCD annunciators  <sup>MAX-MIN</sup>  turn on. The meter beeps when new maximum or minimum reading is updated. Press the button momentarily to read throughout the Maximum (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 21**

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 surpasses single range recording which is easily overflowed, or with insufficient resolution. The M8030 series 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

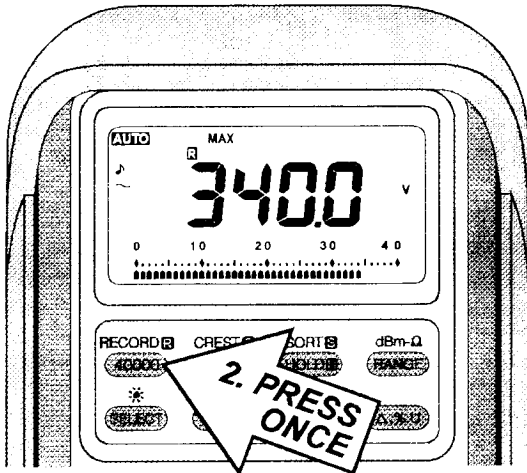
- Note :1. Auto Power Off feature will be disable automatically in this mode
2. To retain the readings after measurements, use **HOLD**  function to stop updating the measurements before disconnecting the test leads. Use similar pushbutton procedures described above to read throughout the locked readings



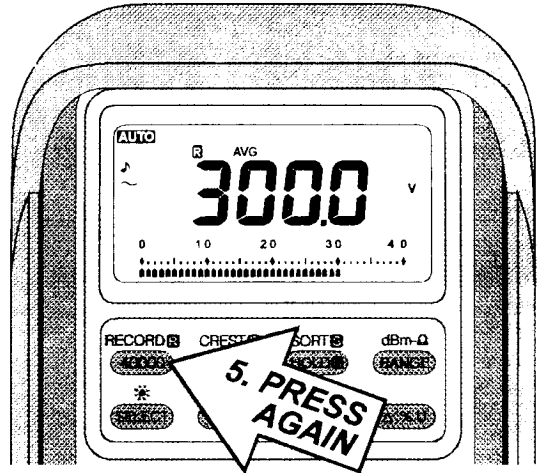
1. PRESS 1 SECOND TO ACTIVATE RECORD



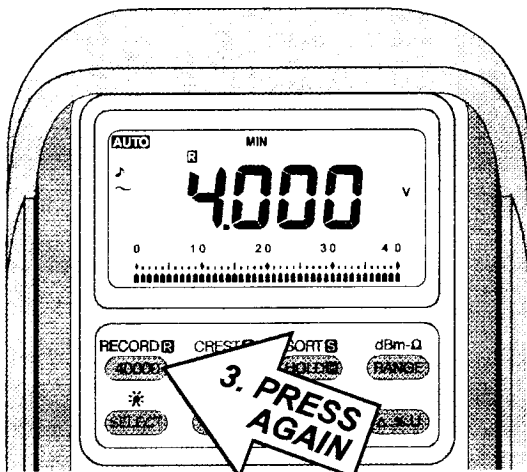
4. PRESS MOMENTARY AGAIN TO SEE MAX-MIN



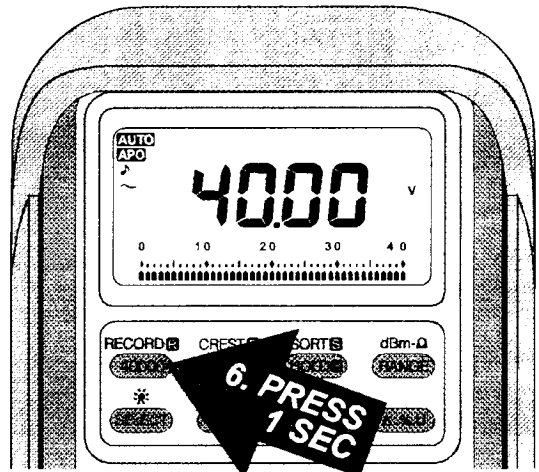
2. PRESS MOMENTARY TO SEE MAXIMUM



5. PRESS MOMENTARY AGAIN TO SEE AVERAGE






3. PRESS MOMENTARY AGAIN TO SEE MINIMUM




6. PRESS 1 SECOND TO EXIT RECORD

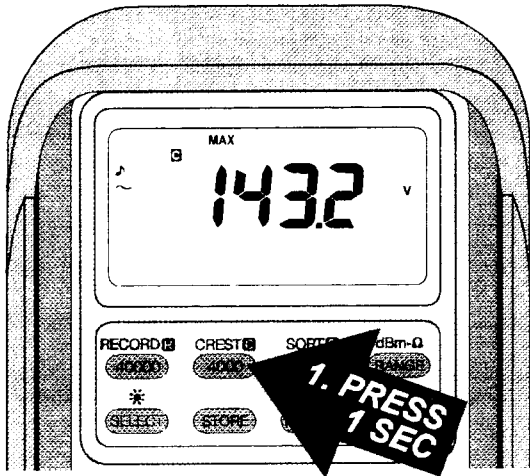
FIG 21. RECORD MODE

### (G) CREST (Instantaneous Peak Value) MODE

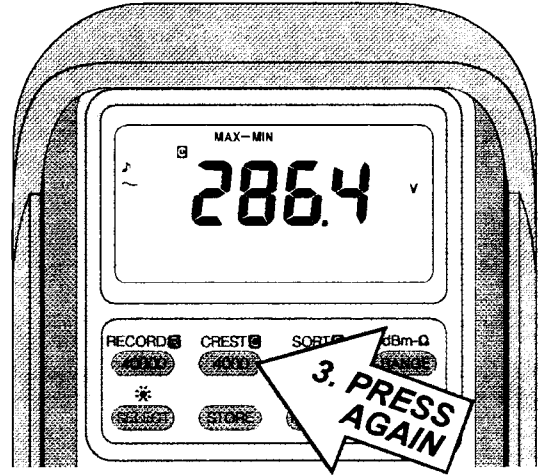
Perform measurements as described in BASIC OPERATION. Press and hold the  button for 1 second or more to activate CREST mode with LCD annunciators  **MAX** turn on. Press the button momentarily to read throughout the Maximum (MAX), Minimum (MIN), and Maximum minus Minimum (MAX – MIN) readings. Press the button for 1 second or more to exit CREST mode. See  **FIG 22**

With the CREST mode, you can capture transient signal crest voltage (instantaneous peak value) as short as 0.8ms. This function can be used to determine crest factor which can indicate the presence of harmonics. Crest factor is the ratio of crest value to the true rms value. A pure sinusoidal waveform has a crest factor of 1.414

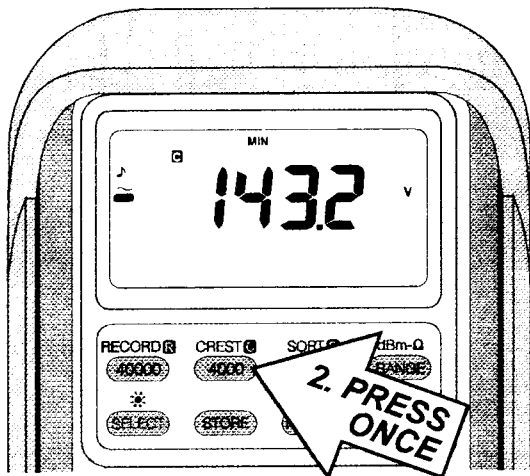
- Note :
1. Auto Power Off feature will be disabled automatically in this mode
  2. To retain the readings after measurements, use HOLD  function to stop updating the measurements before disconnecting the test leads. Use similar pushbutton procedures described above to read throughout the locked readings



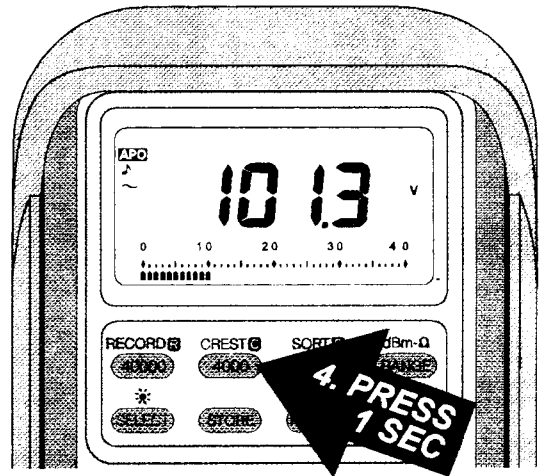
**1. PRESS 1 SECOND  
TO ACTIVATE CREST (MAXIMUM)**



**3. PRESS MOMENTARY  
AGAIN TO SEE CREST  
MAX-MIN ( V<sub>p-p</sub>)**



**2. PRESS MOMENTARY  
TO SEE CREST MINIMUM**






**4. PRESS 1 SECOND  
TO EXIT CREST**

**FIG 22. CREST MODE**



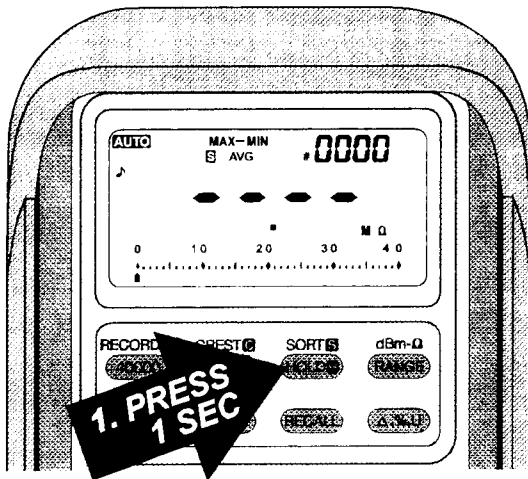
## (H) SORT ™ MODE

Perform measurements as described in BASIC OPERATION. Press and hold the  button for 1 second or more to activate SORT™ mode with LCD

annunciators   turn on. The meter beeps when a stable reading is captured, and the last captured reading together with the number of capture will be automatically hold & displayed. 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 SORT™ mode. See **FIG 23**

SORT™ is one of the most useful innovations. The function senses a stable measurement, beeps, captures it for comparison & display, then stores the maximum and minimum readings together with the event numbers in memory for later display. The average feature calculates all the readings taken and displays the true average value together with number of events counted. This simplifies MAX & MIN values sorting, MAX-MIN & AVG values calculation, and quantity counting in component inspection. When used with relative % change function, readings will be displayed in terms of percentage deviation

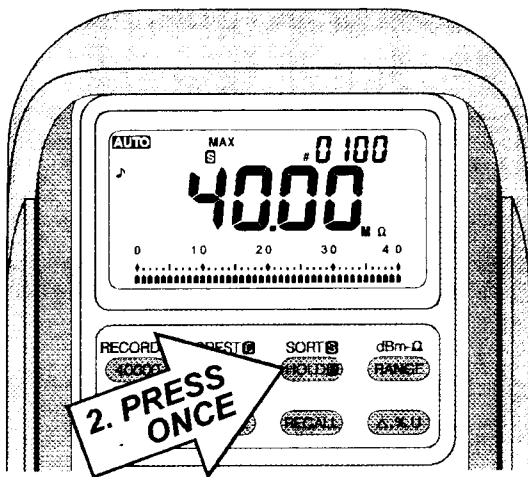
Note : 1. Auto Power Off feature will be disable automatically in this mode



1. PRESS 1 SECOND TO ACTIVATE SORT™



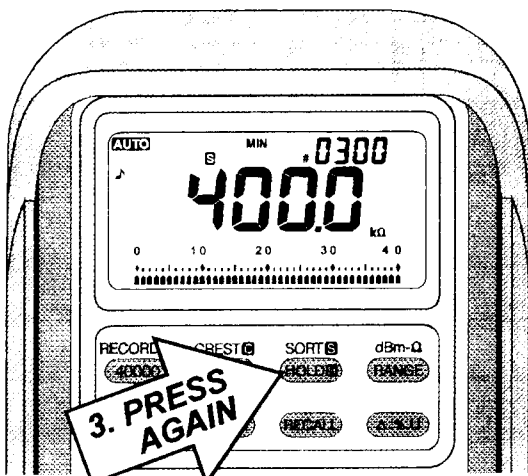
4. PRESS MOMENTARY AGAIN TO SEE MAX-MIN



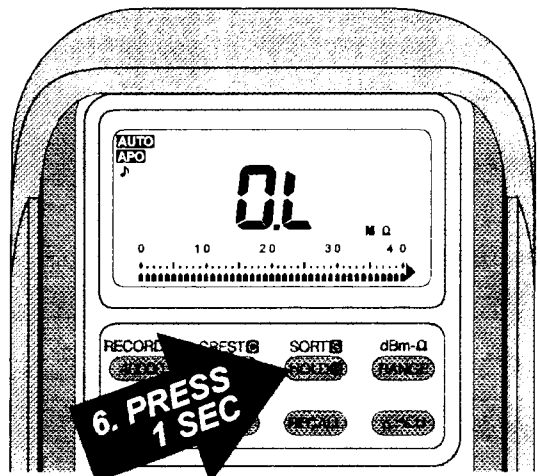
2. PRESS MOMENTARY TO SEE MAXIMUM



5. PRESS MOMENTARY AGAIN TO SEE AVERAGE




3. PRESS MOMENTARY AGAIN TO SEE MINIMUM







6. PRESS 1 SECOND TO EXIT SORT™

FIG 23. SORT™ MODE

### (I) BACK LIGHT FEATURE (M8037 ONLY)



Press and hold the  button for 1 second or more to activate backlight. The backlight will be off 42 seconds after each activation automatically to extend battery life. When the backlight is already on, press and hold the button again will reset the automatic off timing

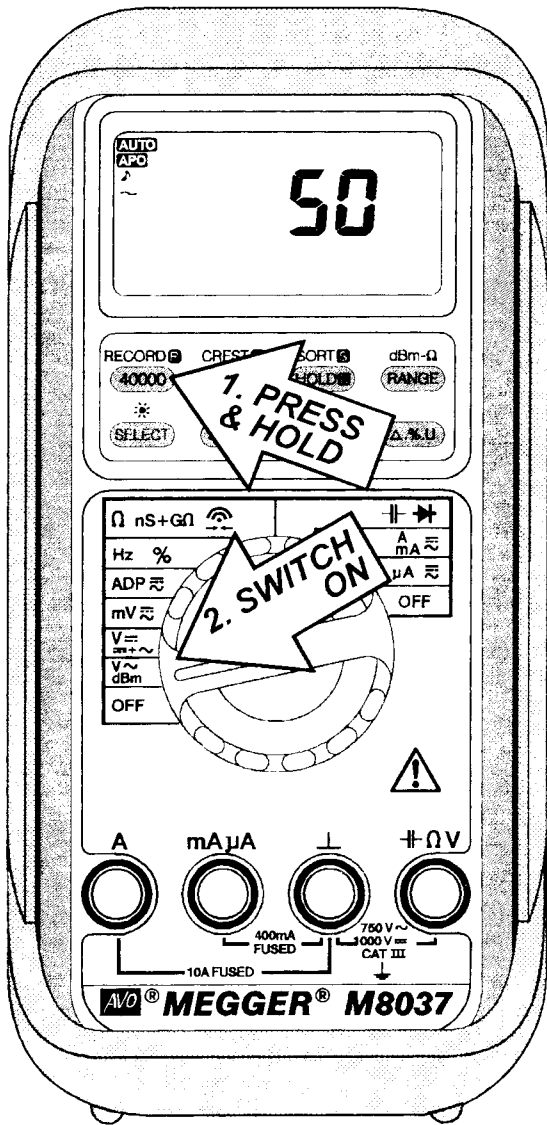
### (J) LINE FILTER FREQUENCY 50 Hz OR 60 Hz SELECT

The line filter frequency can be selected as a power-on option. Press the  button while turning the meter on to display the set frequency. Press the  button for 50 Hz or press the  button for 60 Hz selection. Then press the  button to store the selected frequency. See **FIG 24**

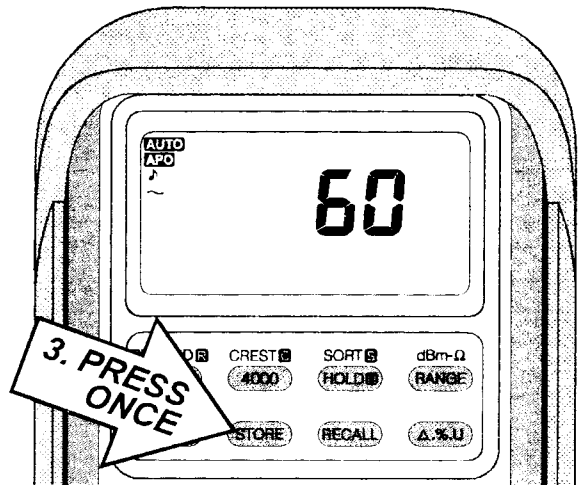
Selecting the appropriate line filter frequency to cope with your line frequency can maximize the meter's noise rejection ability. This is normally only available in expensive bench top multimeter

### (K) SET BEEPER OFF

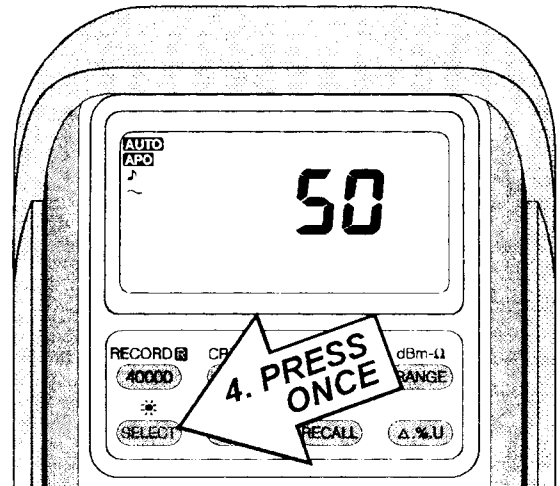
The beeper feature can be disabled manually as a power-on option by pressing the  button while turning the meter on. The LCD annunciator  will be off during operation. All beeper functions are turned off except input warning beeper



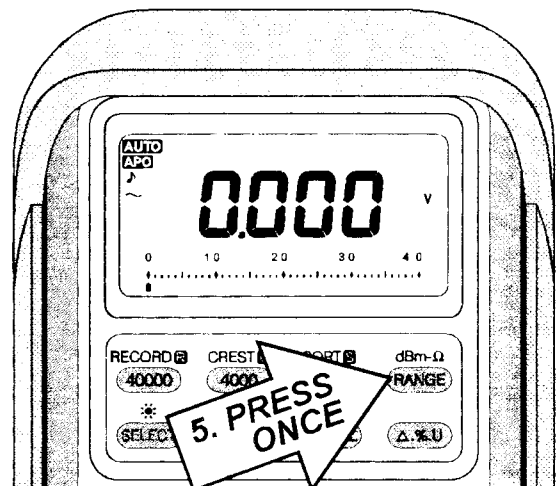
1. PRESS THE BUTTON WHILE  
2. TURNING ON THE METER



3. PRESS MOMENTARY  
TO SELECT 60Hz



4. PRESS MOMENTARY  
TO SELECT 50Hz



5. PRESS MOMENTARY  
TO ENTER (SET)

FIG 24. LINE FILTER FREQUENCY 50Hz OR 60Hz SELECT

## ( L ) AUTO POWER OFF (APO)

The Auto Power Off (APO) mode turns the meter off automatically to extend battery life after 4.5 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 enters the RECORD, CREST or SORT mode, the Auto Power Off will be disabled automatically, and the LCD annunciator **APO** will be off

The Auto Power Off feature can be disabled manually as a power-on option by pressing the <sup>CREST</sup>**4000** button while turning the meter on. The LCD annunciator **APO** will be off during operation

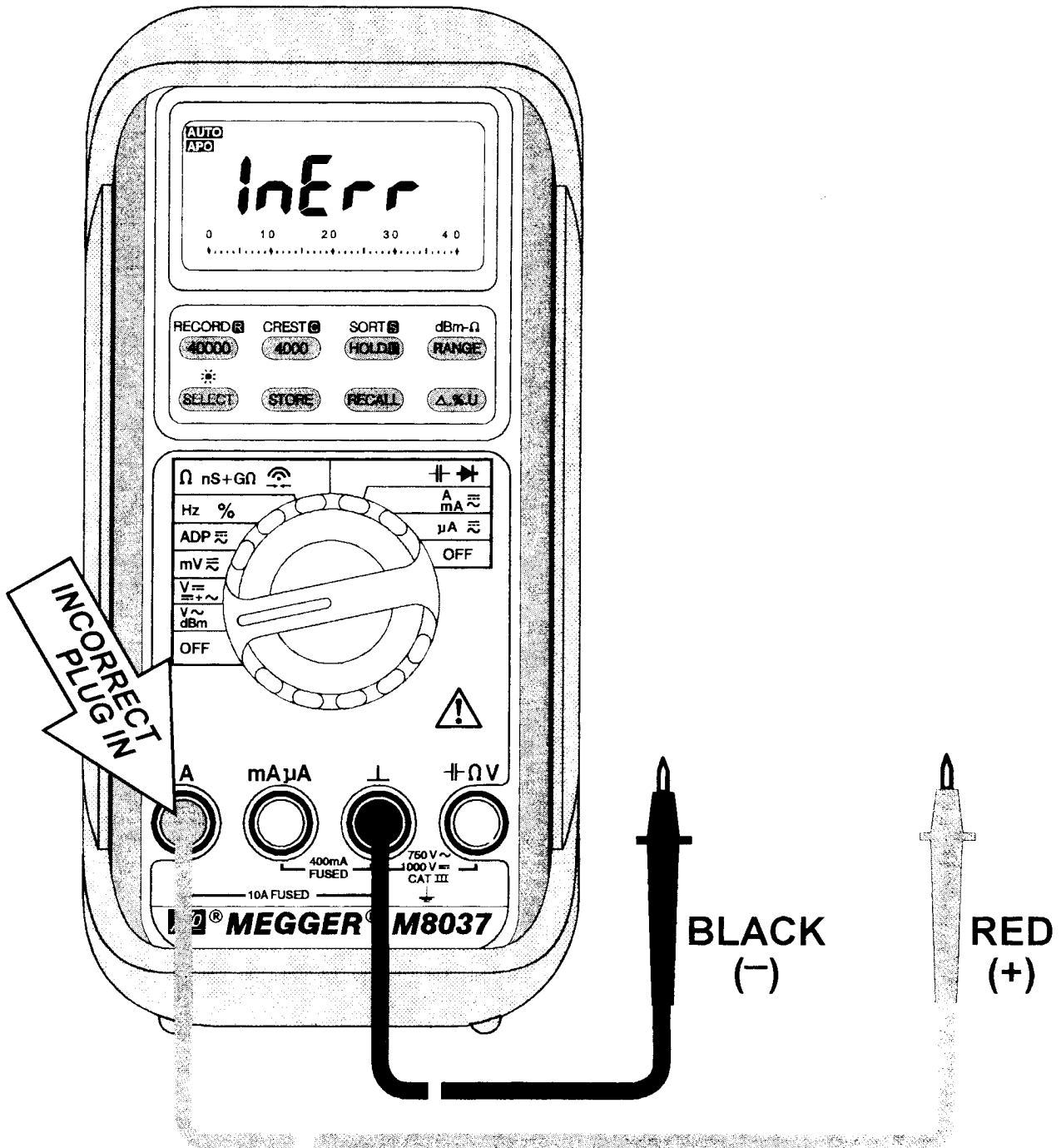
For maintenance purpose, the Auto Power Off timing can be shortened to 5 seconds by pressing the **RANGE** button while turning the meter on

- Note :
1. Stored data (MEM) remains after Auto Power Off, BUT will be erased if the rotary switch is switched to the OFF position
  2. 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

### (M) INPUT WARNING

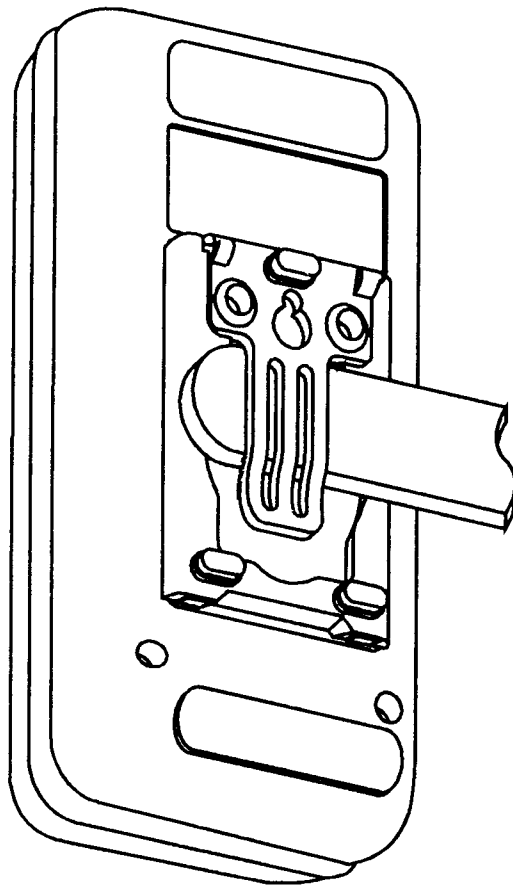
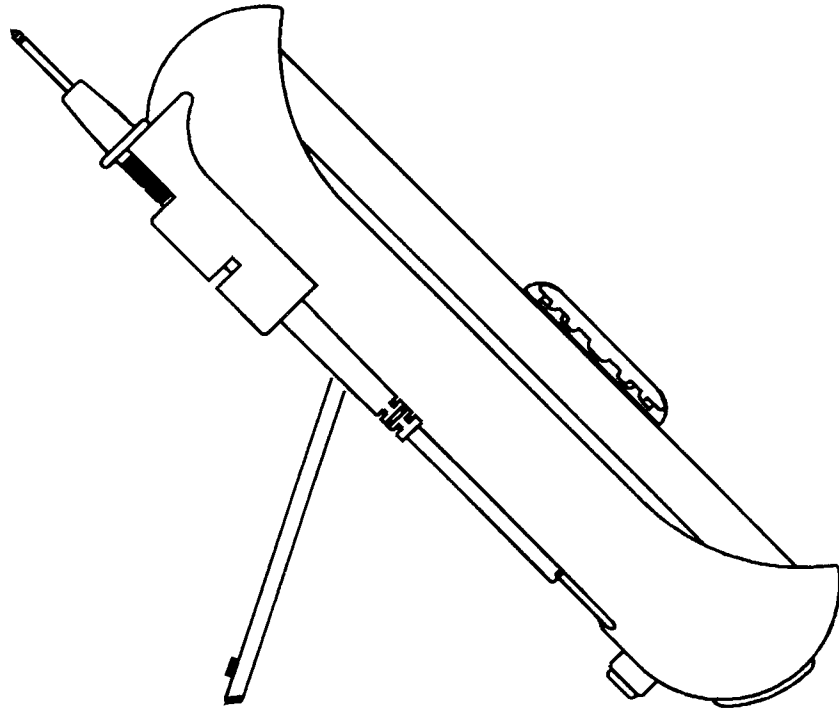
This meter produces a beep tone as well as a 'InErr' display to warn the user against possible damage to the meter due to improper connections to the mA  $\mu$ A or A input jacks. See

**FIG 25**



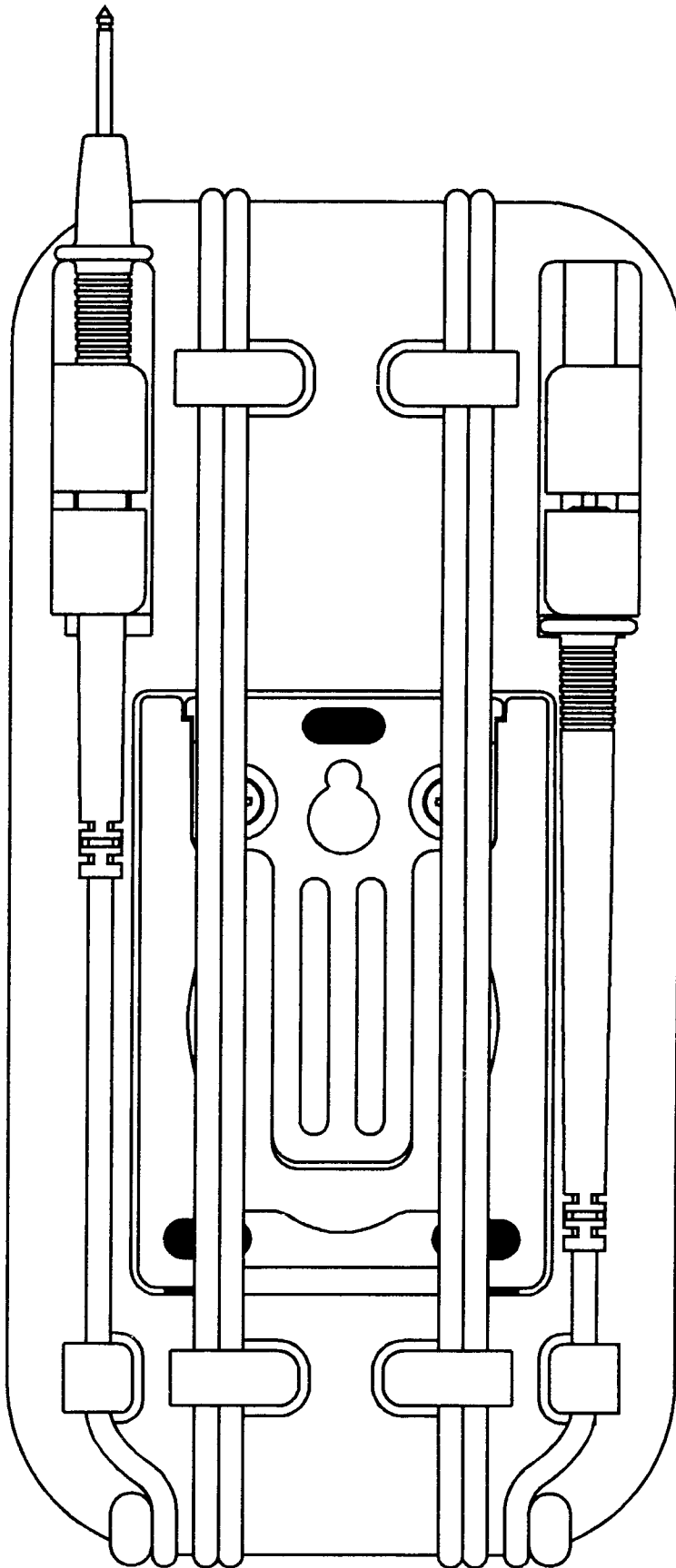
**FIG 25. INPUT WARNING**

**(N) USING TILT STAND & BELT CLIP**



**FIG 26. USING TILT STAND & BELT CLIP**

**(O) USING PROBE HOLDERS & WIRE CLIPPERS**



**FIG 27. USING PROBE HOLDERS & WIRE CLIPPERS**



## (VI) SPECIFICATIONS

### GENERAL SPECIFICATIONS

**Display:** 3-3/4 digits 4000 counts or 4-3/4 digits 40000 counts selectable (5 digits 99999 counts for Hz), and 4 digits 9999 counts dual display LCD

**Polarity:** Automatic

**Update Rate:**

3-3/4D Data: 5 per second nominal;

4-3/4D Data: 1.25 per second nominal;

43 Segments Bar graph: 128 per second max

**Low Battery:** The indicator appears when the battery voltage drops below approx. 5.8V

**Operating Temperature:** 0°C to 35°C, 0-80% R.H.; 35°C to 50°C, 0-70% R.H.

**Storage Temperature:** -20°C to 60°C, 80% R.H. (with battery removed)

**Temperature Coefficient:** Nominal 0.15 x (specified accuracy)/°C @ (0°C—18°C or 28°C—50°C), or otherwise specified

**Power Supply:** Single Alkaline 9V battery NEDA1604A, JIS6AM6 or IEC6LF22

**APO Timing:** Idle for 4.5 minutes

**APO Consumption:** 20  $\mu$  A typical

**Sensing:** True RMS conversion for M8037; Average responding for M8035

**Power Consumption:** 12 mA typical

**Weight:** 390 gm; 500 gm with holster

**Dimension:** L186mm X W87mm X H35.5mm; L198mm X W97mm X H55mm with holster

**Safety:** The instruments meet the requirements for double insulation to IEC 1010-1 (1992), EN 61010-1 (1993) to :

terminal V/R: Installation category III, 1000V dc and 750 Volts ac

terminal mA/uA: Installation category III, 500 Volts ac.

Installation category II, 250 Volts dc.

terminal A: Installation category III, 600 Volts ac.

Installation category II, 250 Volts dc.

**E.M.C.:** The instruments meet EN 50081-1 and EN 50082-1 (1992)

## ELECTRICAL SPECIFICATIONS

ACCURACY IS  $\pm$  (% READING DIGITS + NUMBER OF DIGITS) OR OTHERWISE SPECIFIED, AT 23°C  $\pm$  5°C & LESS THAN 75% R.H.

### DC Voltage

RANGE	M8035	M8037
	Accuracy	
40.00 mV	0.5% + 6d	
400.0mV, 4.000V, 40.00V, 400.0V, 1000V	0.08% + 1d	

NMRR : >60dB @ 50/60Hz

CMRR : >120dB @ DC, 50/60Hz, Rs=1kΩ

Input Impedance : 10MΩ, 30pF nominal (100pF nominal for 40mV & 400mV ranges)

Temperature coefficient : 0.1 X (Specified accuracy)/°C @(0°C 18°C or 28°C 50°C)

Overload protection : 780 Vrms / 1000Vpeak (600 VDC/VAC rms for 40mV & 400mV ranges)

**AC Voltage**

<b>RANGE</b>	<b>M8035</b>	<b>M8037*</b>
	Accuracy	
<b>50Hz — 60Hz</b>		
400.0mV, 4.000V, 40.00V, 400.0V, 750V	0.5% + 3d	0.5% + 3d
<b>40Hz — 1kHz</b>		
400.0mV	0.8% + 3d	0.8% + 3d
4.000V, 40.00V, 400.0V	0.8% + 4d	0.8% + 4d
750V	1.0% + 4d	1.0% + 4d
<b>1kHz — 5kHz</b>		
400.0mV	1.0% + 3d	1.0% + 3d
4.000V, 40.00V, 400.0V	1.0% + 6d	1.0% + 4d
750V	3.0%+8d**	3.0%+6d**
<b>5kHz — 20kHz</b>		
400.0mV	2.0%+6d**	1.5%+6d***
4.000V, 40.00V, 400.0V,	1.8%+8d**	1.8%+6d***
750V	Unspec'd	Unspec'd
<b>20kHz — 50kHz</b>		
400.0mV	Unspec'd	2.5%+6d****

CMRR : >60dB @ DC to 60Hz, Rs=1kΩ

Input Impedance : 10MΩ, 30pF nominal (100pF nominal for 400mV range)

\* AC Coupled True RMS Specified from 5% to 100% of range or otherwise specified; Crest Factor: <3:1 at full scale, and <6:1 at half scale

\*\* Specified from 10% to 100% of range

\*\*\* Specified from 15% to 100% of range

\*\*\*\* Add (30000/reading) counts below 38% of range

Overload protection : 780 Vrms / 1000Vpeak (600 VDC/VAC rms for 400mV range)

**(AC + DC) Voltage**

<b>RANGE</b>	<b>M8037*</b>
	Accuracy
<b>50Hz — 60Hz</b>	
4.000V, 40.00V, 400.0V, 750V	0.8% + 8d
<b>40Hz — 1kHz</b>	
4.000V, 40.00V, 400.0V	1.0% + 8d
750V	1.2% + 8d
<b>1kHz — 5kHz</b>	
4.000V, 40.00V, 400.0V	1.2% + 8d
750V	3.2% + 8d**
<b>5kHz — 20kHz</b>	
4.000V, 40.00V, 400.0V	2.0%+8d***
750V	Unspec'd

CMRR : >60dB @ DC to 60Hz, Rs=1kΩ

Input Impedance : 10MΩ, 30pF nominal

\*DC Coupled True RMS Specified from 5% to 100% of range or otherwise specified; Crest Factor: <3:1 at full scale, and <6:1 at half scale

\*\*Specified from 10% to 100% of range

\*\*\* Specified from 15% to 100% of range

Update Rate : 1.6 per second nominal

Overload protection : 780 Vrms / 1000Vpeak

## AC Current

RANGE	M8035	M8037*	burden Voltage
Accuracy			
<b>50Hz 60Hz</b>			
400.0 $\mu$ A	1.0%+4d	1.0%+4d**	0.15mV/ $\mu$ A
4000 $\mu$ A	0.8%+3d	0.8%+3d	0.15mV/ $\mu$ A
40.00mA	1.0%+4d	1.0%+4d**	3.3mV/mA
400.0mA	0.8%+3d	0.8%+3d	3.3mV/mA
4.000A	1.0%+4d	1.0%+4d**	0.03V/A
10.00A***	0.8%+3d	0.8%+3d	0.03V/A
<b>40Hz 300Hz</b>			
400.0 $\mu$ A	1.5%+4d	1.5%+4d**	0.15mV/ $\mu$ A
4000 $\mu$ A	1.0%+3d	1.0%+3d	0.15mV/ $\mu$ A
40.00mA	1.5%+4d	1.5%+4d**	3.3mV/mA
400.0mA	1.0%+3d	1.0%+3d	3.3mV/mA
4A	1.5%+4d	1.5%+4d**	0.03V/A
10A***	1.0%+3d	1.0%+3d	0.03V/A
<b>300Hz 3kHz</b>			
400.0 $\mu$ A	Unspec'd	Unspec'd	0.15mV/ $\mu$ A
4000 $\mu$ A	1.2%+3d	1.2%+3d	0.15mV/ $\mu$ A
40.00mA	Unspec'd	Unspec'd	3.3mV/mA
400.0mA	1.2%+3d	1.2%+3d	3.3mV/mA
4A	Unspec'd	Unspec'd	0.03V/A
10A***	1.2%+3d	1.2%+3d	0.03V/A

\*AC Coupled True RMS Specified from 5% to 100% of range or otherwise specified

\*\* Specified from 10% to 100% of range

\*\*\*10A continuous; 20A for 30 seconds maximum, 5 minutes cool down interval

mA  $\mu$  A Overload Protection : 0.63A/500V Fuse, Interrupt Rating 200kA

A Overload Protection : 15A/600V Fuse, Interrupt Rating 100kA

## DC Current

RANGE	M8035	M8037	Burden Voltage
	Accuracy		
400.0 $\mu$ A	0.4% + 4d		0.15mV/ $\mu$ A
4000 $\mu$ A	0.2% + 2d		0.15mV/ $\mu$ A
40.00mA	0.4% + 4d		3.3mV/mA
400.0mA	0.2% + 3d		3.3mV/mA
4.000A	0.8% + 6d		0.03V/A
10.00A*	0.4% + 4d		0.03V/A

mA  $\mu$  A Overload Protection : 0.63A/500V Fuse, Interrupt Rating 200kA

A Overload Protection : 15A/600V Fuse, Interrupt Rating 100kA

\*10A continuous; 20A for 30 seconds maximum, 5 minutes cool down interval

## Frequency

RANGE	M8035	M8037
	Accuracy	
99.999Hz, 999.99Hz, 9.9999kHz, 99.999kHz, 999.99kHz, 4.0000MHz	0.002% + 3d	

Sensitivity : 5Hz -- 100kHz\*, > 200 mVrms, < 20 Vrms;

100kHz -- 500kHz, > 400 mVrms, < 20 Vrms;

500kHz -- 2MHz, > 850 mVrms, < 20 Vrms;

2MHz -- 4 MHz, > 1Vrms, < 20 Vrms

\*Pulse Width > 3  $\mu$  s in this frequency range

Update Rate : 1.2 per second nominal

Temperature coefficient : 0.05 X (Specified accuracy)/ $^{\circ}$ C @(0 $^{\circ}$ C--18 $^{\circ}$ C or 28 $^{\circ}$ C -- 50 $^{\circ}$ C)

Overload protection : 600VDC/VAC rms

**Frequency & ACV or AC ADP in Dual Display**

<b>RANGE</b>	<b>M8035</b>	<b>M8037</b>
	Accuracy	
99.99Hz, 999.9Hz, 9.999kHz, 20.00kHz	0.002% + 1d	

Sensitivity\* : 5Hz—100 Hz\*\*, > 15% F.S. of AC range;  
 100Hz—1kHz, > 20% F.S. of AC range;  
 1kHz—10kHz, > 35% F.S. of AC range;  
 10kHz—20kHz, > 50% F.S. of AC range

\*ACV 750V range : 5Hz—100Hz, > 420VAC;  
 100Hz—1kHz, > 550VAC

\*\*Pulse Width > 3  $\mu$ s in this frequency range

Update Rate : 1.3 per second nominal

**Duty Cycle**

<b>RANGE</b>	<b>M8037</b>
	Accuracy
0.1% — 99.9%	0.5d/kHz + 2d

Input Frequency : 50Hz — 300 kHz; 5V Logic Family  
 Pulse Width > 2us

Update Rate : 1.2 per second nominal

Overload protection: 600VDC/VAC rms

## Capacitance

RANGE	M8035	M8037
	Accuracy*	
4.000nF**	4.0% + 10d	
40.00nF	3.0% + 5d	
400.0nF	0.8% + 5d	
4.000 $\mu$ F	0.8% + 3d	
40.00 $\mu$ F	2.0% + 3d	
400.0 $\mu$ F	3.0% + 5d	
4.000mF	3.5% + 5d	
40.00mF	4.0% + 5d	

\* Accuracies with film capacitor or better

\*\* Specified from 10% to 100% of range

Overload protection : 600VDC/VAC rms

## Ohms

RANGE	M8035	M8037
	Accuracy	
40.00 $\Omega$	0.2% + 6d	
400.0 $\Omega$ , 4.000k $\Omega$ , 40.00k $\Omega$ , 400.0k $\Omega$	0.15% + 2d	
4.000M $\Omega$	0.3% + 2d	
40.00M $\Omega$	1.5% + 5d	
400.0nS	0.7% + 5d	

Open Circuit Voltage : <1.3VDC (<3VDC for 40  $\Omega$  & 400  $\Omega$  ranges)

Temperature coefficient : 0.1 X (Specified accuracy)/ $^{\circ}$ C @(0 $^{\circ}$ C 18 $^{\circ}$ C or 28 $^{\circ}$ C 50 $^{\circ}$ C)

Overload protection : 600VDC/VAC rms



## ➔ Diode Tester

Range	Accuracy	Test Current (Typical)	Open Circuit Voltage
4.000V	2%+1d	0.8mA	< 3.5 VDC

Overload Protection : 600VDC/VAC rms

## •))) Audible Continuity Tester

Audible threshold : the beeper sounds if the measured resistance is lower than  $10 \Omega$ , and turns off when greater than  $60 \Omega$ . Response time  $< 150 \mu s$

Overload protection: 600VDC/VAC rms

## DC Adaptor

10 counts per 1 mVDC

Accuracy : 0.08%+1d

Input Impedance :  $1000M\Omega$ , 70pF nominal

Temperature coefficient :  $0.05 X$  (Specified accuracy)/ $^{\circ}C$  @( $0^{\circ}C - 18^{\circ}C$  or  $28^{\circ}C - 50^{\circ}C$ )

Overload protection : 600VDC/VAC rms

## AC Adaptor

10 counts per 1 mVAC

Accuracy : Same as AC 400.0mV range

Input Impedance :  $1000M\Omega$ , 70pF nominal

Temperature coefficient :  $0.1 X$  (Specified accuracy)/ $^{\circ}C$  @( $0^{\circ}C - 18^{\circ}C$  or  $28^{\circ}C - 50^{\circ}C$ )

Overload protection : 600VDC/VAC rms

### **dBm (M8037 only)**

At  $600\ \Omega$ , -2.21dBm to 54.25dBm,

Accuracy :  $\pm 0.25\text{dB} + 2\text{d}$  (@40Hz—20kHz)

Selectable reference impedance of 4, 8, 16, 32, 50, 75, 93, 110, 125, 135, 150, 200, 250, 300, 500, 600, 800, 900, 1000, 1200  $\Omega$

Input Impedance :  $10\text{M}\Omega$ , 30pF nominal

Update Rate : 1.1 per second nominal

Overload protection: 780Vrms / 1000Vpeak

### **RECORD mode**

Nominal Response for DC : 50ms to 80%, 100ms to 99%

Nominal Response for AC : 50ms to 80%, 100ms to 95%

Accuracy : Specified accuracy  $\pm 10$  digits for changes  $> 200\text{ms}$  in duration ( $\pm 40$  digits in AC); 1.5s autoranging buffer (except Cx, AC + DCV)

### **CREST mode**

Accuracy : Specified accuracy  $\pm 220$  digits for changes  $> 0.8\text{ms}$  in duration

### **SORT mode**

Nominal sort rate : 0.2s (except Cx, AC + DCV)


Accuracy : Specified accuracy  $\pm 5$  digits

## VII) MAINTENANCE

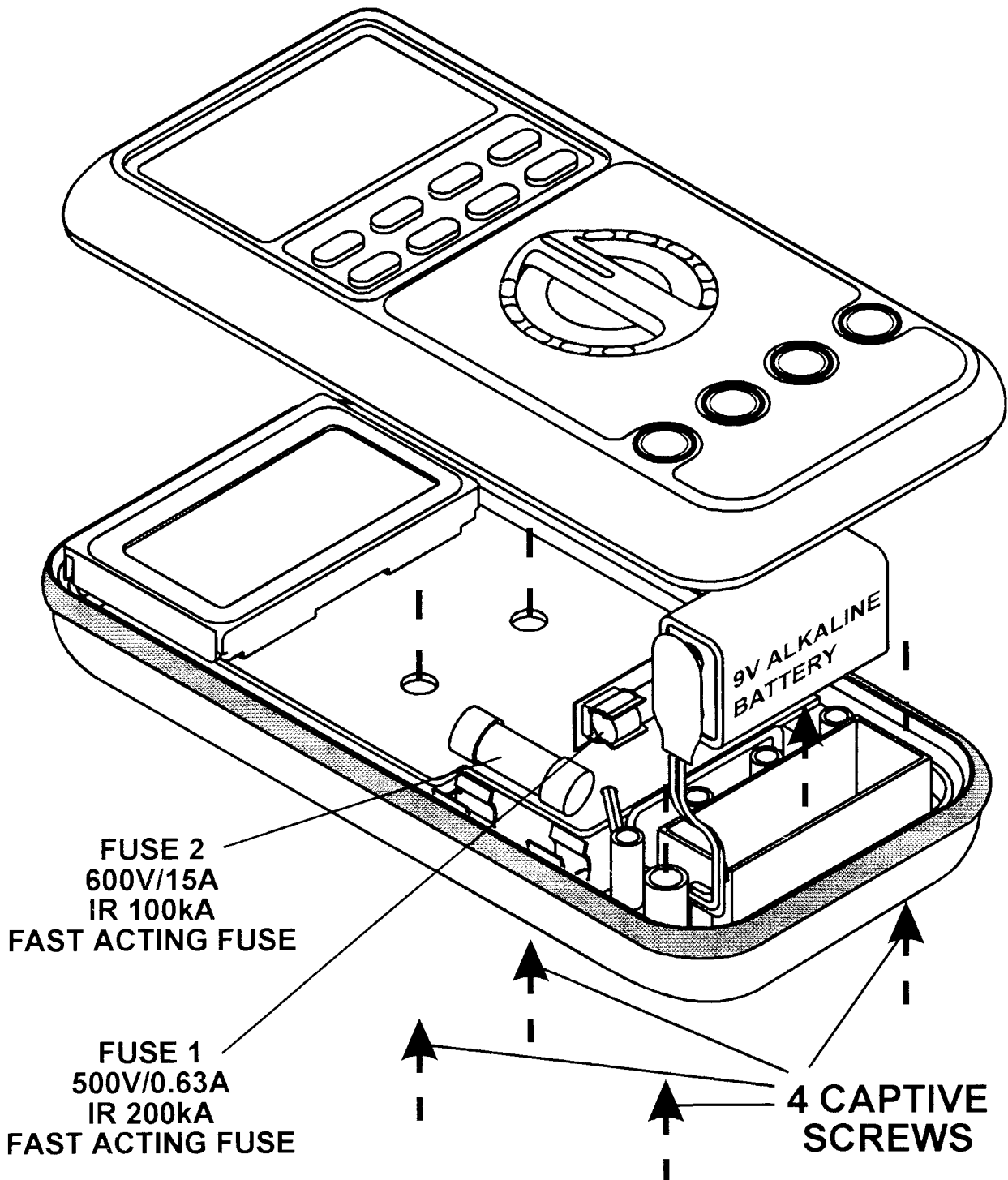
### **WARNING**

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

### **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 alkaline battery (NEDA1604A, JIS6AM6 or IEC6LF22)

- 1) Disconnect the meter from any circuit and remove the test leads from the input jacks
- 2) Turn the meter OFF
- 3) Loosen the four captive screws from the case bottom and turn the case over, see **FIG 28**
- 4) Lift the end of the case top nearest the input jacks until it unsnaps from the case bottom
- 5) Lift gently the battery from the battery compartment, and disconnect the battery from the battery connector
- 6) Snap the battery connector to the terminals of the replacement battery, and reinsert the battery into the battery compartment. Dress the battery leads so that they are properly seated in the compartment groove and will not be pinched between the case top and case bottom
- 7) Replace the case top, 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 4 captive screws



**FIG 28. CHANGING BATTERY & FUSES**

## **Fuse replacement procedure**

The meter uses a 500V/0.63A IR 200kA fast acting fuse (FUSE 1) for mA uA input, and a 600V/15A IR 100kA fast acting fuse (FUSE 2) for A input

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

## **Accessories and replacement parts**

<b><u>Item</u></b>	<b><u>Description</u></b>	<b><u>Part No.</u></b>
BH83Y	Protective Holster (Yellow)	8101-038
BG83	Case Gasket	8101-039
BTS83	Tilt Stand (Black)	8101-040
BBC83	Belt Clip	8101-042
BSU83	Long captive screw, case upper	8101-043
BSL83	Short captive screw, case lower	8101-044
BTL80	4mm Test Tip Industrial Test Lead Set	8101-045
BF80	Fast Acting Fuse 0,63A, 500V	8101-046
BF81	Fast Acting Fuse 15A, 600V	8101-047
-	User Guide M8035 Series	8101-048

## REPAIR AND WARRANTY

The instrument circuit contains static sensitive devices, and care must be taken in handling the printed circuit board. If the protection of an instrument has been impaired it should not be used, and be sent for repair by suitably trained and qualified personnel. The protection is likely to be impaired if, for example, the instrument shows visible damage, fails to perform the intended measurements, has been subjected to prolonged storage under unfavourable conditions, or has been exposed to severe transport stresses.

**New Instruments are Guaranteed for 1 year from the Date of Purchase by the User.**

**Note:** Any unauthorized prior repair or adjustment will automatically invalidate the Warranty.

### Instrument Repair and Spare Parts

For service requirements for **MEGGER**<sup>®</sup> Instruments contact : -

#### **AVO INTERNATIONAL**

Archcliffe Road

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Tel : +44 (0) 1304 502100

Fax : +44 (0) 1304 207342

or

#### **AVO INTERNATIONAL**

510 Township Line Road

Bluebell

PA 19422-2795

U.S.A.

Tel : +1 (215) 646-9200

Fax : +1 (215) 643-2670

or an approved repair company.

### Approved Repair Companies

A number of independent instrument repair companies have been approved for repair work on most **MEGGER**<sup>®</sup> instruments, using genuine **MEGGER**<sup>®</sup> spare parts. Consult the Appointed Distributor / Agent regarding spare parts, repair facilities and advice on the best course of action to take.

### Returning an Instrument for Repair

If returning an instrument to the manufacturer for repair, it should be sent freight pre-paid to the appropriate address. A copy of the Invoice and of the packing note should be sent simultaneously by airmail to expedite clearance through Customs. A repair estimate showing freight return and other charges will be submitted to the sender, if required, before work on the instrument commences.



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