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 Categorie 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

\[\text{Attention! Refer to the explanation in Manual}\]
\[\text{Dangerous Voltage}\]
\[\text{Ground}\]
\[\text{Double Insulation}\]
\[\text{Fuse}\]
\[\text{AC – Alternating Current}\]
\[\text{DC – Direct Current}\]
\[\text{Either DC or AC}\]

- 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)

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**WARNING**

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

<table>
<thead>
<tr>
<th>FUNCTION</th>
<th>TERMINALS</th>
<th>OVERLOAD LEVEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC VOLTAGE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AC VOLTAGE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hz FREQUENCY</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ω RESISTANCE</td>
<td></td>
<td></td>
</tr>
<tr>
<td><img src="image" alt="AUDIBLE CONTINUITY" /></td>
<td>+ &amp; COM</td>
<td>600 VDC or VAC rms</td>
</tr>
<tr>
<td><img src="image" alt="CAPACITANCE" /></td>
<td></td>
<td></td>
</tr>
<tr>
<td><img src="image" alt="DIODE TEST" /></td>
<td></td>
<td></td>
</tr>
<tr>
<td>mA A CURRENT</td>
<td>mA A &amp; COM</td>
<td>10A/600V*</td>
</tr>
</tbody>
</table>

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

3. REL△: 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 announciator indicates relative zero

12.  Analog bar graph with overload flag and polarity

13.  \( \frac{\text{AVG}}{\text{MAX-MIN}} \) These annunciators indicate MAX (Maximum), MIN (Minimum), MAX - MIN (Maximum minus Minimum), or AVG (Average) reading is being displayed

14.  \( \square \) This annunciator indicates the RECORD function is activated

15.  \( \text{APO} \) This annunciator indicates Auto Power Off is enabled

16.  \( \text{AUTO} \) This annunciator indicates Autoranging

17.  \( \square \) This annunciator indicates data HOLD function is activated

18.  \( \approx \) annunciator indicates direct current (DC) is selected. \( \approx \) 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:
Crest Factor = Vcrest / 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
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.

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) $\Omega$ RESISTANCE, $\rightarrow\leftarrow$ CONTINUITY functions

1) Set rotary switch to $\Omega \rightarrow\leftarrow$

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 $\Omega$. Press SELECT button momentarily to select $\rightarrow\leftarrow$ Continuity function (AM50 at $\rightarrow\leftarrow$)

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. $\Omega$ RESISTANCE, $\rightarrow\leftarrow$ 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

**FIG 9. mA, A FUNCTION (AM55 & AM56 only)**
(1) **RELATIVE MODE**
Press the \( \Delta \) button momentarily to enter the Relative Zero (\( \Delta \)) mode, the 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 function.

Press the \( \Delta \) 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 \( \Delta \) turns on. Press momentarily again to release.

(K) **RECORD**
Press and hold the REC button for 1 second or more to activate RECORD mode, the LCD annunciators \( \Delta \) 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
(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°C to 35°C, 0-80% R.H.; 35°C to 40°C, 0-70% R.H.
Storage Temperature: -20°C to 55°C, 0-80% R.H. (with battery removed)
Temperature Coefficient: nominal 0.15 x (specified accuracy)/°C @ 0°C-18°C or 28°C-40°C
Power Supply: Single 9V battery; NEDA1604, JIS006P or IEC6F22
APO Timing: Idle for 4 minutes
APO Consumption: 30 μA Typical
Overload Protections:
mA & A: 15A/600V HBC Fuse, IR 100kA;
Others: 600VDC/VAC rms
terminal V/R: Installation category III, 600V ac and dc
terminal mA: (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°C ±5°C & LESS THAN 75% R.H.

<table>
<thead>
<tr>
<th>DC Voltage</th>
<th>Range</th>
<th>AM50</th>
<th>AM53</th>
<th>AM55</th>
<th>AM56</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>999.9 mV</td>
<td>0.4%+4d</td>
<td>0.3%+3d</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>99.99 V</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>99.99 V</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>600.0 V</td>
<td>0.4%+5d</td>
<td>0.3%+5d</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NMRR</td>
<td></td>
<td>&gt;50dB @ 50/60Hz</td>
<td>&gt;100dB @ DC, 50/60Hz, Rs=1kΩ</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CMRR</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input Impedance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>10MΩ, 30pF nominal</td>
<td>(16MΩ nominal for 999.9mV range)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

AC Voltage

<table>
<thead>
<tr>
<th>Range</th>
<th>AM50</th>
<th>AM53*</th>
<th>AM55</th>
<th>AM56*</th>
</tr>
</thead>
<tbody>
<tr>
<td>50Hz — 200Hz</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>999.9mV</td>
<td>2.5% + 5d</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50Hz — 500Hz</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.999V</td>
<td>1.5% + 4d</td>
<td>1.2% + 4d</td>
<td>1.5% + 4d</td>
<td>1.2% + 4d</td>
</tr>
<tr>
<td>99.99V</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>600.0V</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>500Hz — 2kHz</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.999V</td>
<td>Unspec'd</td>
<td>2.0% + 5d**</td>
<td>Unspec'd</td>
<td>2.0% + 5d**</td>
</tr>
<tr>
<td>99.99V</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>600.0V</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CMRR</td>
<td>&gt;60dB @ DC to 60Hz, Rs=1kΩ</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input Impedance</td>
<td>10MΩ, 30pF nominal</td>
<td>(16MΩ nominal for 999.9mV range)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trms Crest factor</td>
<td>&lt;3:1 at full scale, and &lt; 6:1 at half scale</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
*True RMS Specified from 5% to 100% of range
**True RMS Specified from 10% to 100% of range

DC Current

<table>
<thead>
<tr>
<th>Range</th>
<th>AM50</th>
<th>AM53</th>
<th>AM55</th>
<th>AM56</th>
</tr>
</thead>
<tbody>
<tr>
<td>4000mA</td>
<td>N/A</td>
<td>N/A</td>
<td>0.9% + 4d</td>
<td>0.9% + 4d</td>
</tr>
<tr>
<td>10.00A*</td>
<td>N/A</td>
<td>N/A</td>
<td>0.7% + 3d</td>
<td>0.7% + 3d</td>
</tr>
<tr>
<td>Burden Voltage</td>
<td>0.03V/A</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
*10A Continuous; 20A for 30 Second Max with 5 minutes cool down interval
### AC Current

<table>
<thead>
<tr>
<th>Range</th>
<th>AM50</th>
<th>AM53</th>
<th>AM55</th>
<th>AM56*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Accuracy</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50Hz — 500Hz</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4000mA</td>
<td>N/A</td>
<td>N/A</td>
<td>±2.0% + 6d</td>
<td>±2.0% + 6d**</td>
</tr>
<tr>
<td>10.00A***</td>
<td>N/A</td>
<td>N/A</td>
<td>±1.2% + 5d</td>
<td>±1.2% + 4d</td>
</tr>
<tr>
<td>500Hz — 2kHz</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.00A***</td>
<td>N/A</td>
<td>N/A</td>
<td>Unspec'd</td>
<td>±3% + 5d</td>
</tr>
</tbody>
</table>

- 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

<table>
<thead>
<tr>
<th>Range</th>
<th>AM50</th>
<th>AM53</th>
<th>AM55</th>
<th>AM56</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Accuracy</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>999.9Ω</td>
<td>1.2%+6d</td>
<td>0.5%+6d</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9,999Ω</td>
<td>1.2%+3d</td>
<td>0.5%+2d</td>
<td></td>
<td></td>
</tr>
<tr>
<td>99.9kΩ</td>
<td>1.5%+3d</td>
<td>0.8%+2d</td>
<td></td>
<td></td>
</tr>
<tr>
<td>999.9kΩ</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.000MΩ</td>
<td>4%+3d</td>
<td>1.5%+2d</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

### Capacitance

<table>
<thead>
<tr>
<th>Range</th>
<th>AM50</th>
<th>AM53</th>
<th>AM55</th>
<th>AM56</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Accuracy</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.000μF</td>
<td>N/A</td>
<td>1.0% + 4d</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.00μF</td>
<td>N/A</td>
<td>1.0% + 3d</td>
<td></td>
<td></td>
</tr>
<tr>
<td>100.0μF</td>
<td>N/A</td>
<td>2.0% + 4d</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.000mF</td>
<td>N/A</td>
<td>4.0% + 5d</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Range</th>
<th>AM50</th>
<th>AM53</th>
<th>AM55</th>
<th>AM56</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accuracy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.999Hz, 999.9kHz, 9.999kHz, 50.00kHz</td>
<td>N/A</td>
<td></td>
<td>0.04% + 4d</td>
<td>0.02%+4d</td>
</tr>
</tbody>
</table>

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

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

Temperature

<table>
<thead>
<tr>
<th>Range</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>±20°C to 300°C / 0°F to 572°F</td>
<td>±(3°C+1d) / ±(6°F+2d)</td>
</tr>
<tr>
<td>301°C to 500°C / 573°F to 932°F</td>
<td>±(2%+1d) / ±(2%+2d)</td>
</tr>
</tbody>
</table>

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

Diode Tester

<table>
<thead>
<tr>
<th>Range</th>
<th>Test Current (Typical)</th>
<th>Open Circuit Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.999V</td>
<td>0.5mA</td>
<td>&lt; 3.5 VDC</td>
</tr>
</tbody>
</table>

Audible Continuity Tester

<table>
<thead>
<tr>
<th>AM53</th>
<th>AM55</th>
<th>AM56</th>
</tr>
</thead>
<tbody>
<tr>
<td>Audible threshold: the beeper sounds if the measured resistance is lower than 10 Ω, and turns off when greater than 200 Ω. Response time &lt; 150 μs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Audible threshold: the beeper sounds if the measured voltage is lower than 30 mV, and turns off when greater than 200 mV. Response time &lt; 500 ms</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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 Sécurité Debrancher Les Cables Avant D’Ouvrir” 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
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

<table>
<thead>
<tr>
<th>Amprobe P/N</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTL-90A</td>
<td>AM50 Series Test Leads</td>
</tr>
<tr>
<td>H-50</td>
<td>AM50 Series Horstler</td>
</tr>
<tr>
<td>KL-15</td>
<td>AM50 Series Fuse, 600V/15A</td>
</tr>
<tr>
<td>97758</td>
<td>AM50 Series Inst. Manual</td>
</tr>
<tr>
<td>MN1604</td>
<td>9 Volt Battery</td>
</tr>
<tr>
<td>TAC-DMM</td>
<td>Temperature Adaptor, Banana to K-type single thermocouple</td>
</tr>
<tr>
<td>TPK-56</td>
<td>K-Bead Probe, -50°C to +800°C, -50°F to +142°F</td>
</tr>
</tbody>
</table>

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 appear 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.