



User Manual

Digital Multimeter

AM-1109





EN 61010-1

CAT III 1000V

Pollution Degree 2

Definition of Symbols:



Caution: Refer to Accompanying Documents



Caution: Risk of Electric Shock



Double Insulation

Over-voltage Category II (CAT II):

Equipments of this category are energy-consuming equipments to be supplied from the fixed installation.

Over-voltage Category III (CAT III):

Equipment in fixed installations.

Over-voltage Category IV (CAT IV)

Equipment of this category is used at the origin of the installation

WARNING: If the digital multi-meter is used in a manner not specified by the manufacturer, the protection provided by the digital multi-meter may be impaired.

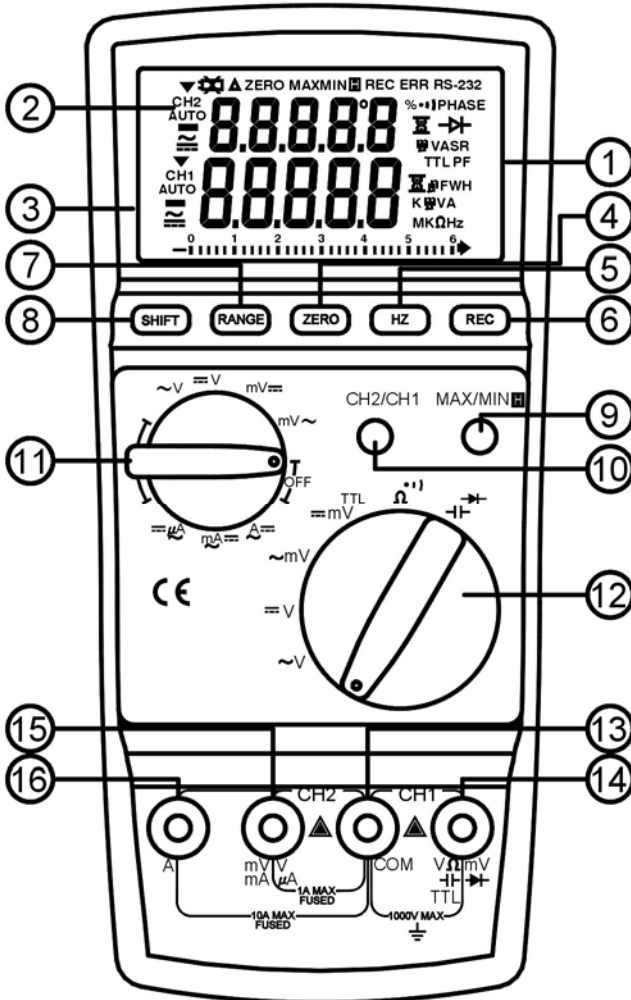
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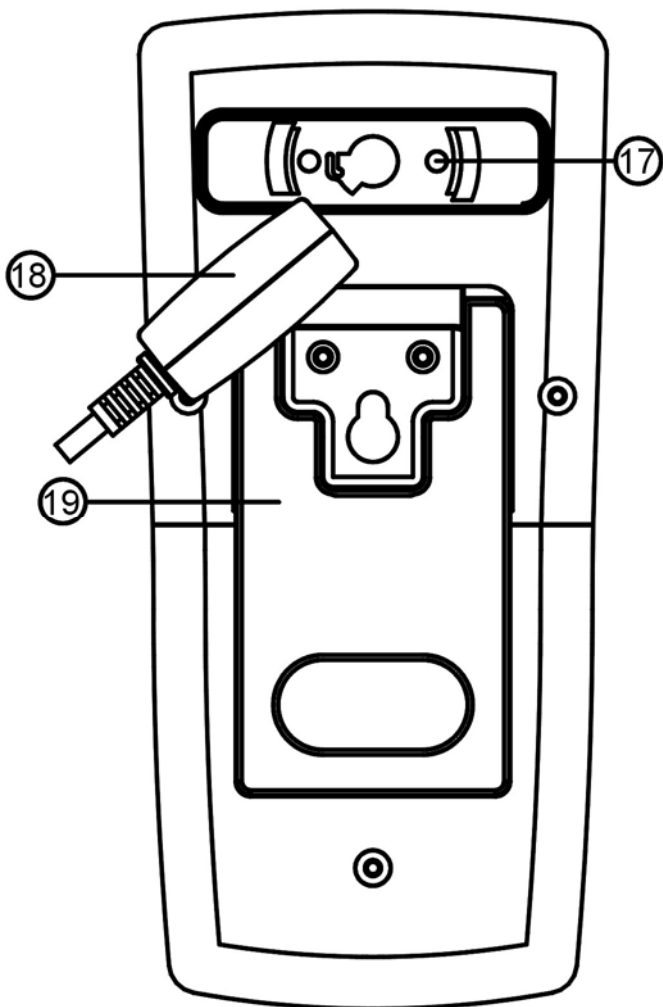
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1. Features

- 60,000 counts and dual input channels
- 0.03% DC basic accuracy and 0.1% AC basic accuracy
- Bandwidth of 200KHz (max.), And true RMS
- Fast ACV, ACA response
- Better AC accuracy than that of a bench-top DMM
- More functions than those of a bench-top DMM
- Much lower cost than that of a bench-top DMM
- Study the relationship of two voltages similar to a dual channels DSO
- Study of relationship of voltage and current with one DMM
- Dual display of frequency and duty cycle
- Record data of both channels using a PC through the RS-232C interface
- Standalone data logging of 10,708 records for both channels (903)

2. Panel Description





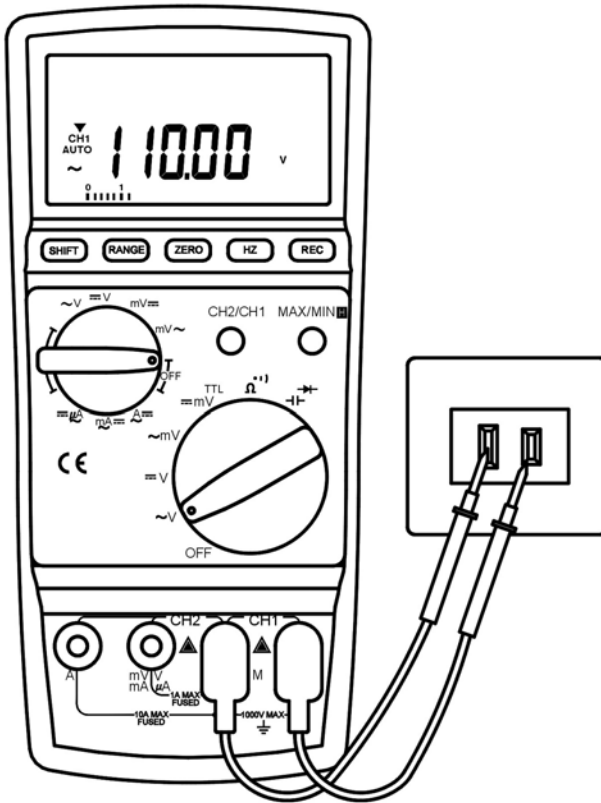
1. LCD
2. Upper row of LCD is used to display value, unit, and function of channel 2.
3. Lower row of LCD is used to display value, unit, and function of channel 1.
4. Button of ZERO function. Once this button is pressed, all the subsequent measurement will be calculated with respect to the value zeroed.
5. Button of Hz function. When the function is DCV, ACV, mV, AC mV, μ A, mA, or A, users can press this button to measure the frequency of the input signal.
6. Button of REC function. Press this button to start recording. Holding the REC button and turning the power on will clear the data memory. Now users can set the sampling time after memory is clear. Press the RANGE button to increment the sampling time in seconds.
7. To enter the manual mode, press this button. Press again to select desired range for voltage, current, resistance, or capacitance. To exit manual mode, press and hold the button for 2 seconds.
8. SHIFT button is used to select the auxiliary function marked by blue characters.
9. MAX/MIN/HOLD button. If users press it once, the LCD value will be hold, and the unit starts to record the maximum and minimum values measured of both channels. The ZERO function will be cancelled once this function is enabled. If users press the button again, LCD will display the maximum value. If the users press the

button again, LCD will display the minimum value. To exit this mode, press and hold this button for 2 seconds.

10. Button to select channel 1 or channel 2. It is used with the SHIFT button or Hz button, so users know which channel is selected to perform the SHIFT or Hz function.
11. Rotary switch to select function for channel 2
12. Rotary switch to select function for channel 1
13. Common Terminal. This terminal is used as common reference input
14. Channel 1 Input Terminal. This terminal is used as input for measurement of voltage, current, resistance, capacitance, or frequency. Users can select the function through the use of rotary switch for channel 1.
15. Channel 2 Input Terminal. This terminal is used as input for measurement of voltage, low current (μA or mA), or frequency. Users can select the function through the use of the rotary switch for channel 2.
16. High Current Input Terminal. This terminal can be inputted up to 10A. Users can select 10A input through rotary switch of channel 2.
17. RS-232C interface window
18. RS-232C connector (Accessory)
19. Stand

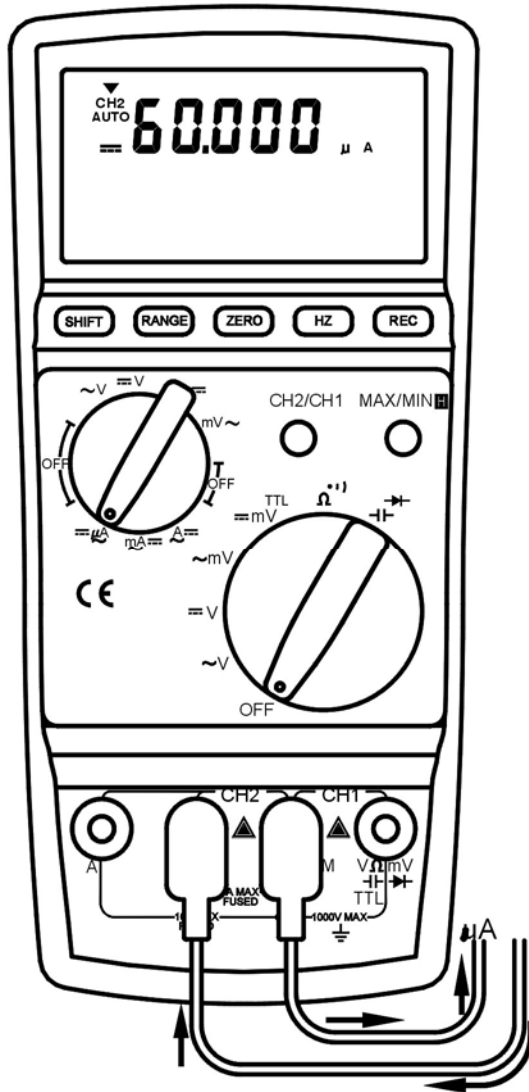
3. Operating Instruction

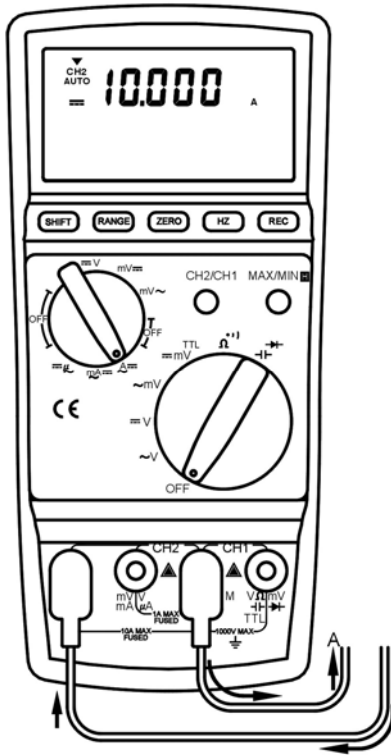
3.1 AC/DC Voltage (V or mV) Measurement



- Set the rotary switch of the channel used (Channel 1 or Channel 2) at proper location (ACV, DCV, AC mV, or DC mV)
- Insert the test lead into the input jack of the channel used (Channel 1 or Channel 2)
- Connect the test prods in PARALLEL to the circuit to be measured.
- Read the measured value from the LCD display.

3.2 AC/DC Current (A, mA, or μ A) Measurement.

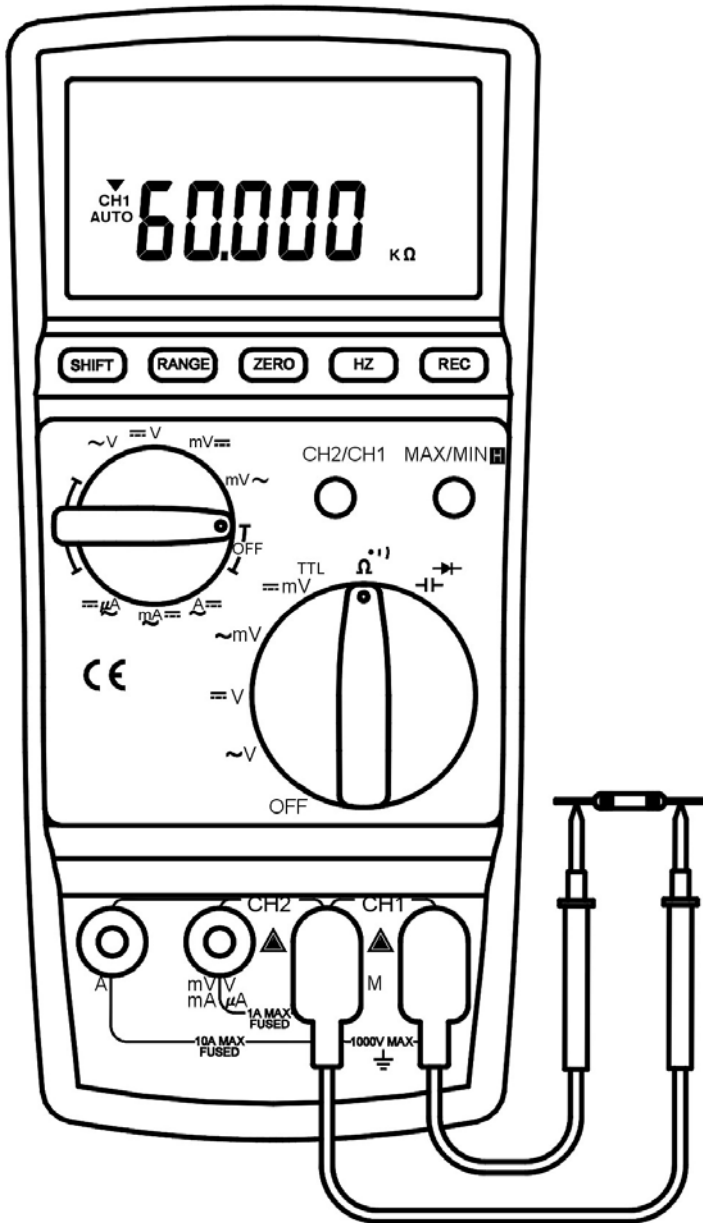




- Set the rotary switch of the channel 2 at proper position (ACA, DCA, AC mA, DC mA, AC μ A, or DC μ A)
- Insert the test lead into the proper input jack of the channel 2.
- Connect the test prods in SERIES with the circuit to be measured.
- Read the measured value from the LCD display.

Note: It is recommended to set the rotary switch of channel 1 at **OFF** position.

3.3 Resistance (Ω) Continuity (\cdot) Measurement

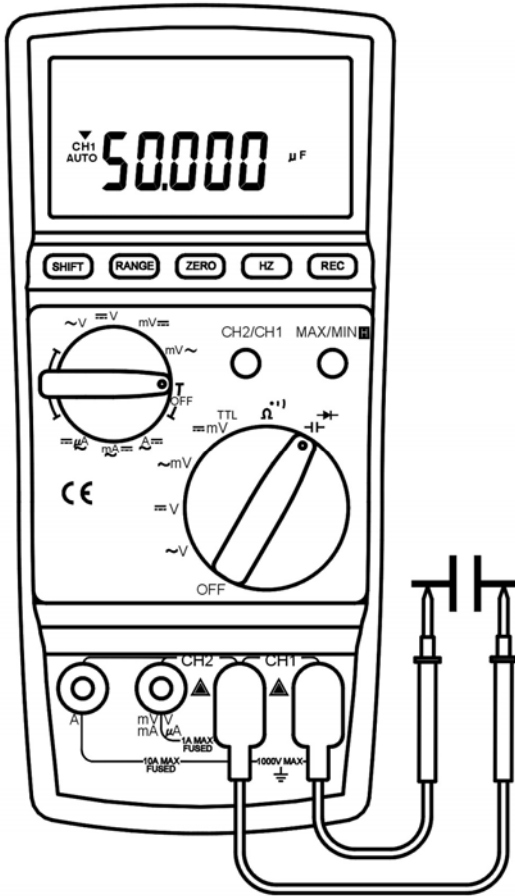


- a. Set the rotary switch at Ω position.
- b. Insert the test leads into the input jack of channel 1
- c. Connect the test prods to the two ends of the resistor or circuit to be measured.
- d. Read the measured value from the LCD display

Note: To perform measurement of continuity (••), press the SHIFT button. A beeping sound will be heard, if the measured resistance is less than 40Ω .

Note: When the measurement of resistance or continuity is selected, the function of channel 2 is automatically disabled.

3.4 CAPACITANCE (μF) Measurement

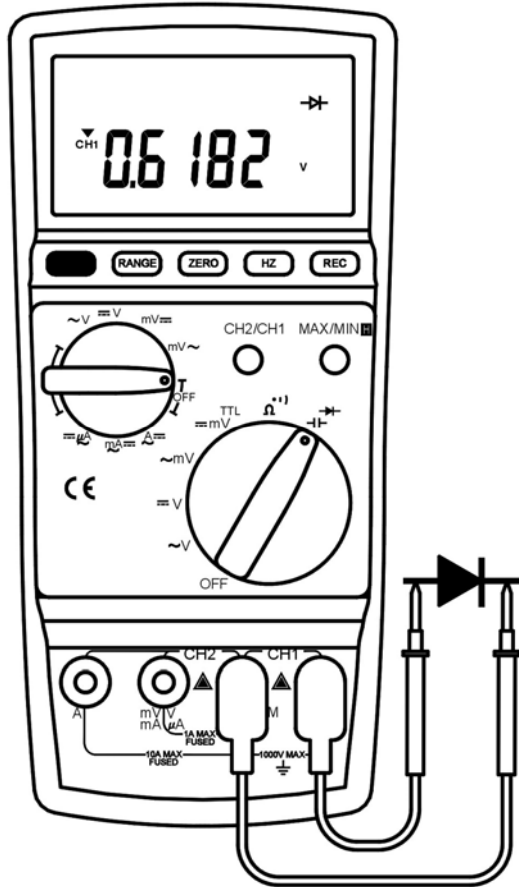


- Set the rotary switch at μF position.
- Insert the test leads into the input jack of channel 1
- Connect the test prods to the two ends of the capacitor to be measured.
- Read the measured value from the LCD display

NOTE: If auto range is selected, the range is of 6000 counts. If manual range is selected, the range is extended to 9999 counts.

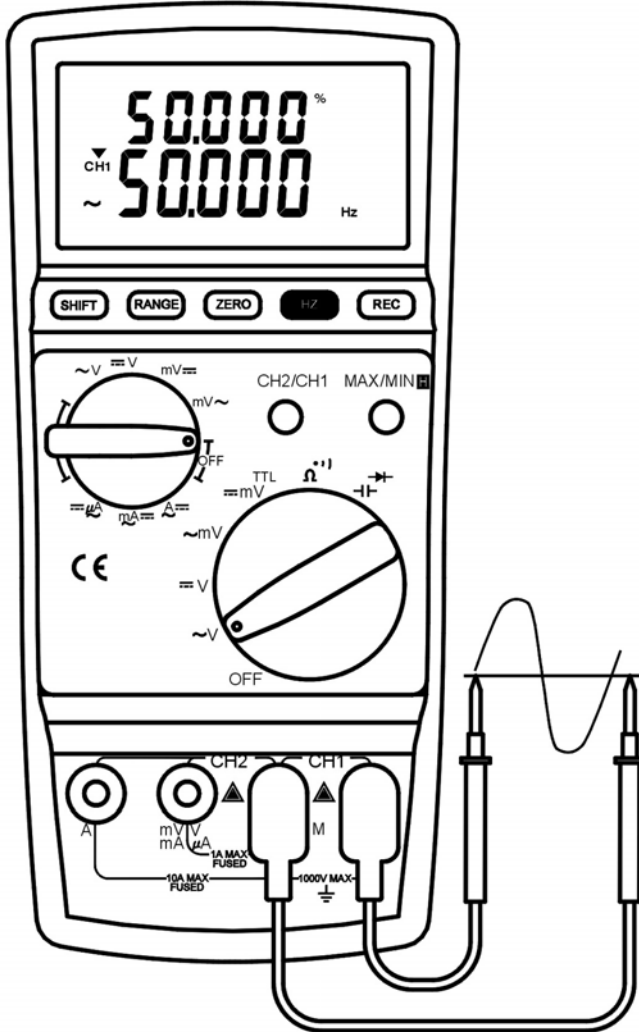
NOTE: When the measurement of capacitance or diode is selected, the function of channel 2 is automatically disabled.

3.5 Diode Measurement



- Set the rotary switch at $\rightarrow|$ position, and press the SHIFT button to perform diode measurement.
- Insert the test leads into the input jack of channel 1
- Connect the test prods to the two ends of the diode to be measured.
- Read the measured value from the LCD display

3.6 ACV Frequency (Hz) and Duty Cycle (%)



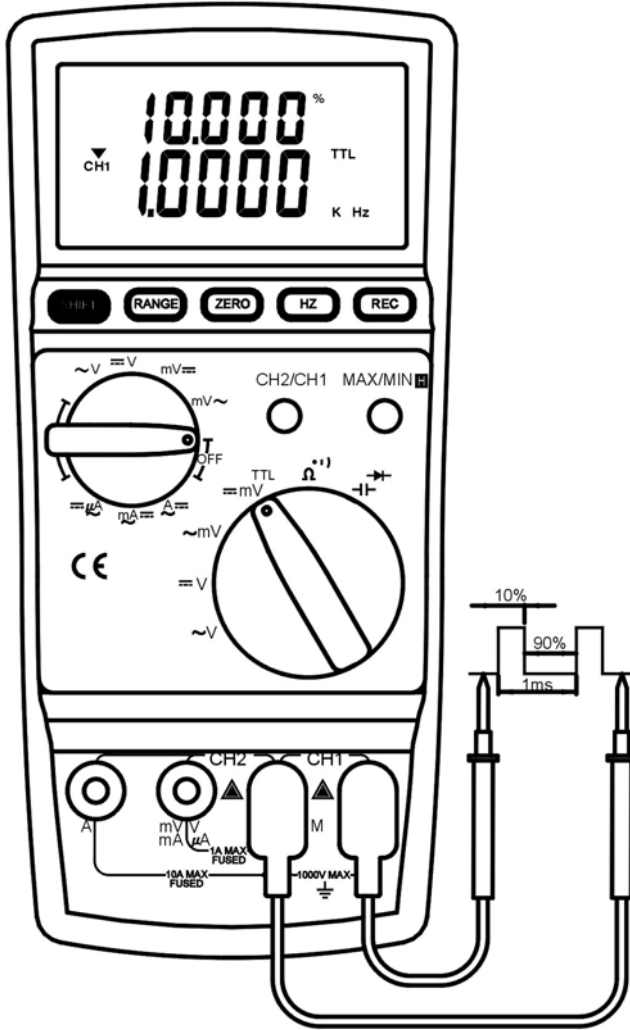
If the rotary switch is set at either position of V, mV, A, mA, or μ A, the measurement of frequency and duty cycle can be selected by pressing the SHIFT button.

Example 1: If the rotary switch is set at ACV of channel 1, and channel 1 is selected (pointed by a triangular symbol). Users press the Hz button. Then the frequency and duty of the ACV at channel 1 will be displayed at LCD.

Example 2: If the rotary switch is set at AC mA of channel 2, and channel 2 is selected (pointed by a triangular symbol). Users press the Hz button. Then the frequency and duty cycle of AC mA at channel 2 will be displayed at LCD.

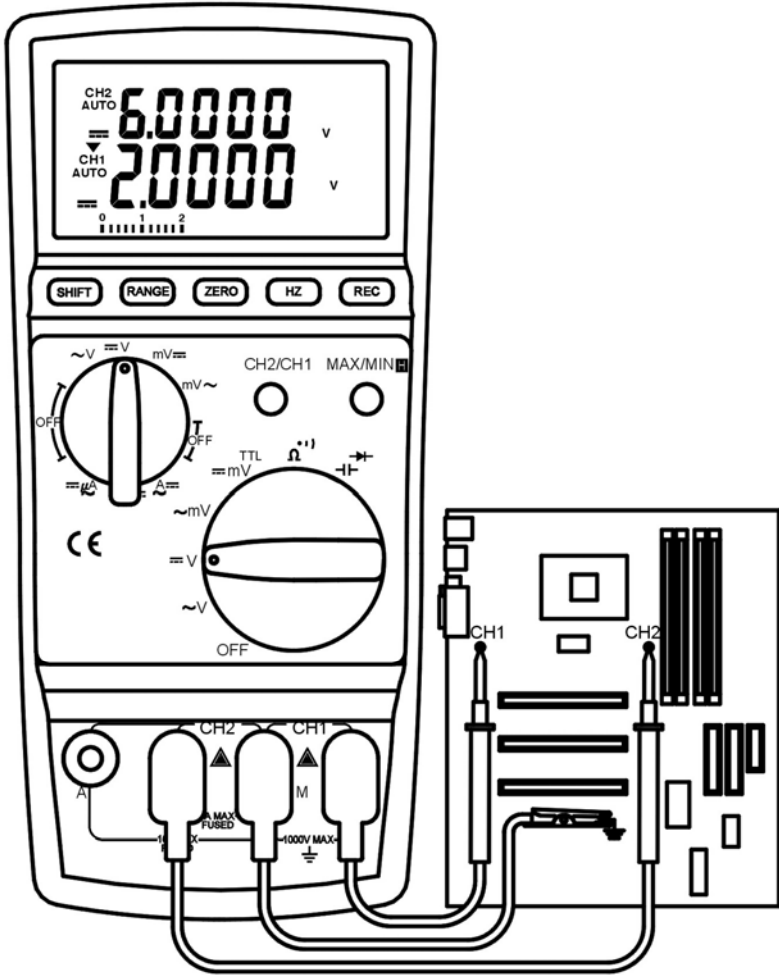
Note: To select channel 1 or channel 2, press the CH1/CH2 button. A triangular symbol will point to the channel selected. Once a channel is selected, the function of SHIFT, RANGE, and Hz buttons will apply to the channel.

3.7 TTL Frequency (Hz) and Duty Cycle (%)



Users set the rotary switch at DC mV of channel 1. If the SHIFT button is pressed, the DMM will perform measurement of frequency and duty cycle of a TTL signal

3.8 Dual Channels Measurement (V + V)



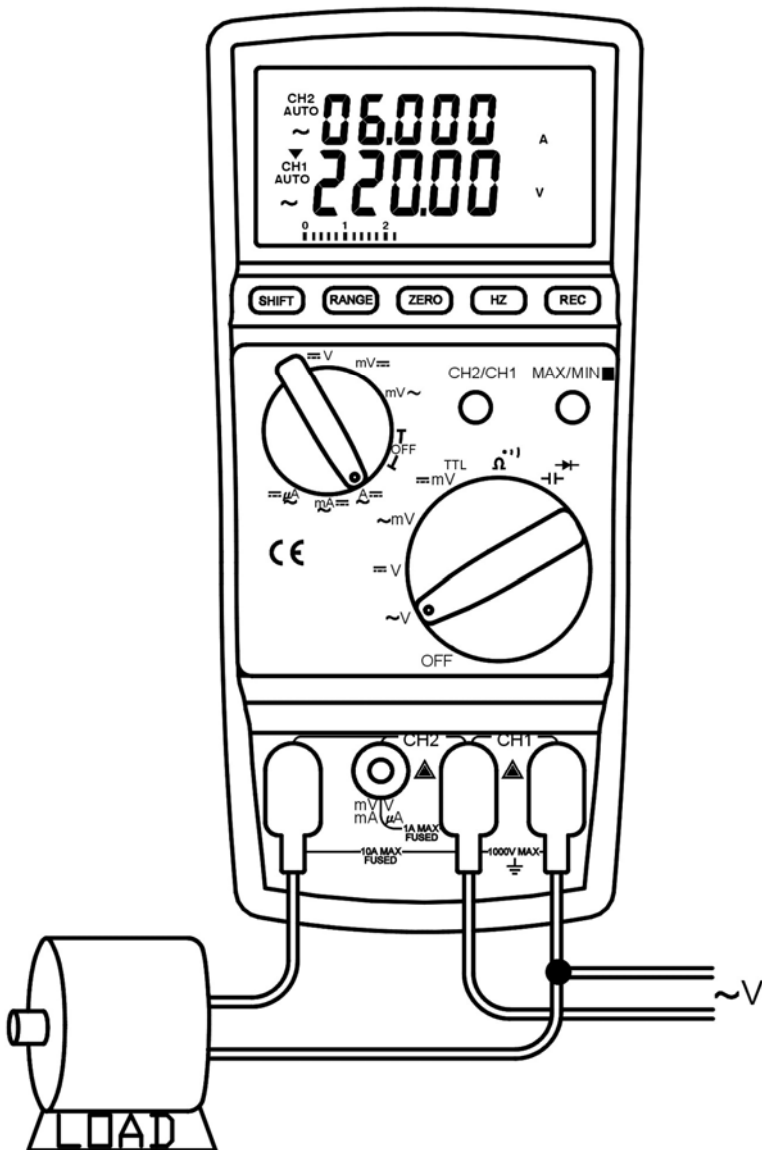
This unit can perform dual channels measurement of voltages at the same time. The internal circuit will multiplex between two channels. It is very useful when users need to observe the relationship between two signals in a circuitry similar to dual channels DSO.

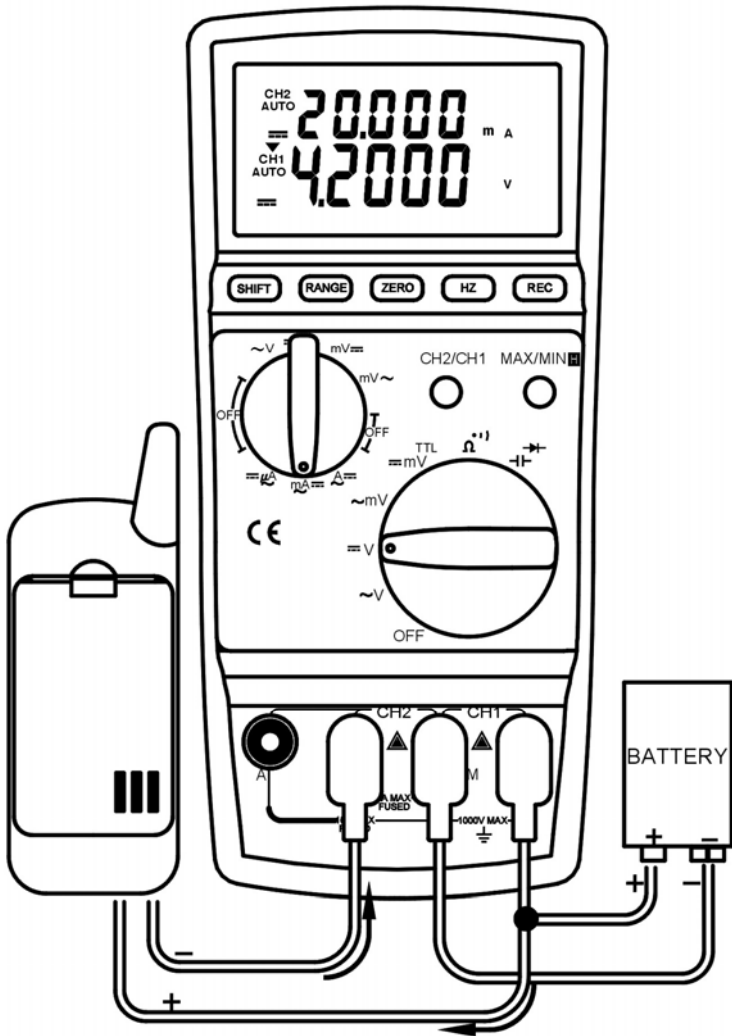
- a. Select desired voltage function (ACV, DCV, AC mV, or DC mV) of channel 1 through lower right rotary switch.
- b. Select desired voltage function (ACV, DCV, AC mV, or DC mV) of channel 2 through upper left rotary switch.
- c. Insert the test leads to the input jacket.
- d. Connect the test prods in PARALLEL to the circuit to be measured
- e. Read the corresponding voltage of channel 1 and channel 2 from the LCD display.

WARNING: Both Channels (1 and 2) share the same ground. Two voltages of different grounds can't be measured.

NOTE: During the dual channels measurement (DC - 400Hz), it is recommended to measure two voltages whose level are within 10 times of magnitude. It is not recommended to measure two voltages of 100 times difference (e.g., mV versus hundreds of volts).

3.9 Dual Channels Measurement (V + A)





This unit can perform dual channels measurement of voltage and current at the same time. The internal circuit will multiplex between two channels. It is very useful when users need to observe the relationship between voltage and current in a circuitry.

- a. Select desired voltage function (ACV, DCV, AC mV, or DC mV) of channel 1 through lower right rotary switch.
- b. Select desired voltage function (ACA, DCA, AC mA, DC mA, AC μ A, or DC μ A) of channel 2 through upper left rotary switch.
- c. Insert the test leads to the input jacket.
- d. Connect the test prods in PARALLEL to the voltage circuit to be measured, and connect the test prods in SERIES with the current to be measured.
- e. Read the corresponding voltage of channel 1 and current of channel 2 from the LCD display.

Note: The COM terminal should be used as CURRENT ground, while A terminal should be used as VOLTAGE ground. Though two grounds are connected in two different terminals, they are actually connected by a FUSE.

Warning: Both Channels (1 and 2) share the same ground. Voltage and current of different grounds can't be measured.

Note: Please refer to the supplemental dual channels specification (**DC – 400Hz**) for the additional specification, which is introduced by the dual channels measurement.

3.10 Auto and Manual Ranging

When the unit is powered on, AUTO ranging is the default setting. To select specific range, press RANGE button to go into MANUAL mode. Then, press RANGE button again to select any desired range. To exit MANUAL mode, press and hold the RANGE button for 2 seconds.

3.11 Relative Measurement (ZERO)

If users want to perform measurement with respect to current reading, users can press the ZERO button. Once the ZERO button is pressed, all the subsequent measurement will be subtracted from the ZEROED value.

3.12 MAX, MIN, and HOLD

To hold the current reading at LCD, users can press the MAX/MIN/HOLD button. Meanwhile, the maximum and minimum values are recorded. Press the same button again, the unit will display the MAX value. Press the same button again, the unit will display the MIN value. To exit MAX/MIN/HOLD mode, press and hold the button for 2 seconds.

3.13 RS-232C Interface and Commands

The protocol of RS-232C is

Baud rate:	9600
Data bits:	8
Stop bit:	1
Parity:	none

Followings are list of commands (case sensitive)

Commands	Contents
?	RS-232C output continuously
/	Stop RS-232C
(SPACE)	RS-232C output once
R	Enter MANUAL range
A	Return to AUTO range
H	HOLD
D	Exit HOLD mode
Z	Enter mode of relative (ZERO) measurement
O	Exit ZERO mode
M	Start data logging (recording)
L	Stop data logging (recording)
F	Select SHIFT function
P	Enter Hz function
CNTRL+C	Clear data logger memory
CNTRL+D	Download data to PC

Followings are example of RS-232C output

CH1 AC 200.00V

CH2 AC 1.000V

CH1 AC 199.99V

CH2 AC 0.900V

.....

3.14 Selecting Sampling Time of Data Logging (903)

Hold the REC button and turn the power on. The LCD will show the current sampling time in seconds. To change the sampling time, press the RANGE button once to increment the sampling time by 1. To increment the sampling time faster, hold the RANGE button for more than 2 seconds. When users see the number to be close to what they desire, release the RANGE button. Then increment one by one to the number desired. Hold the REC button for 2 seconds to return to DMM function.

Note: It is strongly recommended to set the sampling time at more than 2 seconds for dual channels data logging.

3.15 Start and Stop Datalogging

Press the REC button to start data logging. LCD will show a REC symbol. To stop data logging, press the REC button again.

Users can resume data logging by pressing the REC button again. If current functions are different than previous functions, the unit will prohibit users from starting datalogging. And a symbol of ERR at the LCD will be shown to warning the users.

Note: If low battery condition is detected during data logging, the data logging function will be stopped automatically

Note: Capacitance and frequency/duty cycle data can't be recorded in the data logging function.

Note: If the sampling time is set at 0 seconds, DMM will record one data and stop data logging. To record next data, users can press the REC button again.

3.16 Download Data to PC (903)

To download data to PC, users need to connect a RS-232C cable between DMM and PC. Set up the right protocol for communication (9600,8,n, 1). Press CNTL+D. Once the DMM receive the CNTL+D, it will send all the data stored in the memory in ASCII format to PC through RS-232C interface.

The data of channel 1 will be down loaded first. Then the data of channel 2 will follow if there are.

CH1 AC 200.00V

CH1 AC 1.000V

CH1 AC 199.99V

CH1 AC 0.900V

.....

CH2 AC 200.00V

CH2 AC 1.000V

CH2 AC 199.99V

.....

3.17 Clear Data Logger Memory

There are two ways to clear memory. The first way is achieved by sending CNTL+C through RS-232C interface. Once the DMM receives CNTL+C from RS-232C interface, it clears all the data memory.

The second way is to hold the REC button of the unit and turn the power on. Once the power is on, the data logger memory will be cleared. Users can change the sampling time now. Or users can return to normal mode of measurement by holding the REC button for 2 seconds.

4. Specification (23°C±5°C)_

The following accuracy is specified for one single channel (channel 1 or channel 2). If dual channels are used at the same time, additional % of accuracy should be added to the listed accuracy. Please refer to the supplemental dual channels specification. The following accuracy is also specified for the ZEROED (relative) value. The accuracy is given as ±% of reading ± number of least significant digits.

DC Voltage:(Input Impedance: 10MΩ)

Range	Resolution	Accuracy	Overload Protection
60.000mV	0.001mV	±0.1%±5dgts ¹	DC 1000V
600.00mV	0.01mV	±0.03%±3dgts ^{2, 3}	DC 1000V
6.0000V	0.0001V	±0.03%±3dgts	DC 1000V
60.000V	0.001V	±0.03%±3dgts	DC 1000V
600.00V	0.01V	±0.03%±3dgts	DC 1000V
1000.0V	0.1V	±0.04%±3dgts	DC 1000V

¹ To achieve the specified accuracy in the 60mV range, users must short the input and zero the reading by pressing the ZERO button before taking any measurement (for channel 1 and channel 2) .

² To achieve the specified accuracy in the 600mV range for channel 2, users must short the input and zero the reading by pressing the ZERO button before taking any measurement (for channel 2 only) .

³ Add additional 0.02% for channel 2.

AC Voltage: The accuracy of ACV or AC mV is specified for 5%-100% of range from 20Hz – 200KHz, True RMS, crest factor < 3 at full scale, and < 6 at half scale except 1000V range where it is 1.5 at full scale and 3 at half scale. Input Impedance is 10M Ω , and overloaded protection is AC 1000V for all range. Accuracy is also specified for single channel (channel 1 or channel 2). If dual channels measurements are performed, additional specification of accuracy will be introduced. Please refer to the supplemental dual channels specification. Due to the wide bandwidth, the reading might not be zero when no inputs present. But the residual reading does not affect the listed accuracy. If the AC reading is less than 100 least significant counts, it is set to zero by the unit.

Range (ACV)	Resolution	Accuracy (50/60Hz)	Accuracy (45Hz – 1KHz)
60.000mV	0.001mV	$\pm 0.1\% \pm 20 \text{dgts}$	$\pm 0.3\% \pm 20 \text{dgts}$
600.00mV	0.01mV	$\pm 0.1\% \pm 20 \text{dgts}$	$\pm 0.3\% \pm 20 \text{dgts}$
6.0000V	0.0001V	$\pm 0.1\% \pm 20 \text{dgts}$	$\pm 0.3\% \pm 20 \text{dgts}$
60.000V	0.001V	$\pm 0.1\% \pm 20 \text{dgts}$	$\pm 0.6\% \pm 20 \text{dgts}$
600.00V	0.01V	$\pm 0.1\% \pm 20 \text{dgts}$ ¹	$\pm 0.6\% \pm 20 \text{dgts}$
1000.0V (0–400V)	0.1V	$\pm 0.1\% \pm 20 \text{dgts}$	$\pm 2\% \pm 30 \text{dgts}$
1000.0V (400-1000V)	0.1V	$\pm 0.1\% \pm 20 \text{dgts}$ ²	(45Hz – 400Hz) $\pm 2\% \pm 30 \text{dgts}$

¹ For channel 2, add additional 0.05% for the range of 400 to 600V.

² For channel 2, add additional 0.05%.

Range (ACV)	Accuracy (20Hz - 45Hz)	Accuracy (1KHz – 10KHz)	Accuracy (10KHz – 20KHz)
60.000mV	$\pm 0.8\% \pm 25 \text{dgts}$	$\pm 2\% \pm 20 \text{dgts}$	$\pm 2.5\% \pm 20 \text{dgts}$
600.00mV	$\pm 0.8\% \pm 25 \text{dgts}$	$\pm 1\% \pm 20 \text{dgts}$	$\pm 2.5\% \pm 20 \text{dgts}$
6.0000V	$\pm 0.8\% \pm 25 \text{dgts}$	$\pm 1\% \pm 20 \text{dgts}$	$\pm 2.0\% \pm 20 \text{dgts}$
60.000V	$\pm 0.8\% \pm 25 \text{dgts}$	$\pm 1\% \pm 20 \text{dgts}$	$\pm 2.0\% \pm 20 \text{dgts}$
600.00V (0-400V)	$\pm 0.8\% \pm 25 \text{dgts}$	$\pm 5\% \pm 20 \text{dgts}$	Not Specified
600.00V (400-600V)	$\pm 0.8\% \pm 25 \text{dgts}$	Not Specified	Not Specified
1000.0V (0-400V)	$\pm 0.8\% \pm 25 \text{dgts}$	$\pm 2\% \pm 40 \text{dgts}$	Not Specified
1000.0V (400-1000V)	$\pm 0.8\% \pm 25 \text{dgts}$	Not Specified	Not Specified

Range (ACV)	Accuracy (20KHz – 50KHz)	Accuracy (50KHz – 100KHz)	Accuracy (100kHz – 200KHz)
60.000mV	$\pm 4\% \pm 40 \text{dgts}$	$\pm 4\% \pm 40 \text{dgts}$	Not Specified
600.00mV	$\pm 2\% \pm 40 \text{dgts}$	$\pm 2\% \pm 40 \text{dgts}$	$\pm 2\% \pm 40 \text{dgts}$
6.0000V	$\pm 2\% \pm 40 \text{dgts}$	$\pm 2\% \pm 40 \text{dgts}$	$\pm 2\% \pm 40 \text{dgts}$
60.000V	$\pm 4\% \pm 40 \text{dgts}$	$\pm 4\% \pm 40 \text{dgts}$	Not Specified
600.00V	Not Specified	Not Specified	Not Specified
1000.0V	Not Specified	Not Specified	Not Specified

DC Current:(10A terminal is protected by a 20A fast blown, high energy fuse, and the terminal of μA and mA is protected by 1A fast blown, high energy fuse)

Range	Resolution	Accuracy
600.00 μA	0.01 μA	$\pm 0.2\% \pm 10$ dgts
6000.0 μA	0.1 μA	$\pm 0.1\% \pm 10$ dgts
60.000mA	0.001mA	$\pm 0.2\% \pm 10$ dgts
600.00mA	0.01mA	$\pm 0.1\% \pm 10$ dgts
1.0000A	0.0001A	$\pm 0.1\% \pm 10$ dgts
10.000A ¹	0.001A	$\pm 0.3\% \pm 10$ dgts

¹**20A overload for maximum 30 seconds**

AC Current:(The accuracy is specified for a single channel for 5%-100% of range for 45Hz – 20KHz, True RMS, 10A terminal is protected by a 20A fast blown, high energy fuse, and the terminal of μA and mA is protected by 1A fast blown, high energy fuse. If the AC reading is less than 100 least significant digits, it is set to zero by the unit)

Range (ACA)	Resolution	Accuracy (50/60Hz)	Accuracy (45Hz – 1KHz)
600.00 μA	0.01 μA	$\pm 0.3\% \pm 20$ dgts	$\pm 0.4\% \pm 20$ dgts
6000.0 μA	0.1 μA	$\pm 0.3\% \pm 20$ dgts	$\pm 0.4\% \pm 20$ dgts
60.000mA	0.001mA	$\pm 0.3\% \pm 20$ dgts	$\pm 0.4\% \pm 20$ dgts
600.00mA	0.01mA	$\pm 0.3\% \pm 20$ dgts	$\pm 0.4\% \pm 20$ dgts
1.0000A	0.0001A	$\pm 0.3\% \pm 20$ dgts	$\pm 0.4\% \pm 20$ dgts
10.000A ¹	0.001A	$\pm 0.5\% \pm 20$ dgts	$\pm 0.4\% \pm 20$ dgts

¹**20A overload for maximum 30 seconds**

Range (ACA)	Accuracy (20Hz - 45Hz)	Accuracy (1KHz – 10KHz)	Accuracy (10KHz – 20KHz)
600.00 μ A	$\pm 1\% \pm 20$ dgts	$\pm 2\% \pm 20$ dgts	$\pm 1\% \pm 20$ dgts
6000.0 μ A	$\pm 1\% \pm 20$ dgts	$\pm 2\% \pm 20$ dgts	$\pm 1\% \pm 20$ dgts
60.000mA	$\pm 1\% \pm 20$ dgts	$\pm 0.5\% \pm 20$ dgts	$\pm 1\% \pm 20$ dgts
600.00mA	$\pm 1\% \pm 20$ dgts	$\pm 0.5\% \pm 20$ dgts	$\pm 1\% \pm 20$ dgts
1.0000A	$\pm 1\% \pm 20$ dgts	$\pm 1.5\% \pm 20$ dgts	Not Specified
10.000A ¹	$\pm 2\% \pm 20$ dgts	$\pm 1.5\% \pm 20$ dgts	Not Specified

¹20A overload for maximum of 30 seconds

Supplemental Dual Channels Specification (DC – 400Hz):

The following accuracy should be added to all the listed accuracy if dual channels measurements are performed.

	ACV (Ch2)	DCV (Ch2)	ACA (Ch2)	DCA (Ch2)
ACV (Ch1)	$\pm 1\% \pm (V1 - V2)$ * 200 PPM (Ch1, Ch2)	$\pm 0.5\% \pm (V1 - V2)$ * 20 PPM (Ch1, Ch2)	$\pm 0.1 \mu A / V$ (μA , Ch2) $\pm 1 \mu A / V$ (mA, Ch2) $\pm 0.2mA / V$ (A, Ch2) $\pm 2mV / A$ (mV, Ch1) $\pm 5mV / A$ (V, Ch1)	$\pm 0.25\%$ (Ch1, Ch2)
DCV (Ch1)	$\pm 0.5\% \pm (V1 - V2)$ * 20 PPM (Ch1, Ch2)	$\pm 0.25\%$ (Ch1, Ch2)	$\pm 0.25\%$ (Ch1, Ch2)	$\pm 0.25\%$ (Ch1, Ch2)

The result of (V1-V2) * PPM is of volts.

V1: the voltage reading in volts of channel 1

V2: the voltage reading in volts of channel 2

PPM: parts per million, Ch1: Channel 1, Ch2: Channel2

Resistance:(Ω)

Range	Resolution	Accuracy	Overload Protection
999.99 Ω	0.01 Ω	$\pm 0.19\% \pm 8$ dgts	AC 1000V
9.9999K Ω	0.0001K Ω	$\pm 0.39\% \pm 3$ dgts	AC 1000V
99.999K Ω	0.001K Ω	$\pm 0.39\% \pm 3$ dgts	AC 1000V
999.99K Ω	0.01K Ω	$\pm 0.19\% \pm 3$ dgts	AC 1000V
9.9999M Ω	0.0001M Ω	$\pm 0.2\% \pm 6$ dgts	AC 1000V
40.000M Ω	0.001M Ω	$\pm 1\% \pm 6$ dgts	AC 1000V

Continuity: (*), open voltage 3V approx.)

Range	Resolution	Beeper	Overload Protection
999.99 Ω	0.01 Ω	< 40 Ω approx.	AC 1000V

Capacitance:(\pm , auto range, and for film capacitor or better)

Range	Resolution	Accuracy ¹
60.00nF	0.01nF	$\pm 0.8\% \pm 5$ dgts
600.0nF	0.1nF	$\pm 1.5\% \pm 5$ dgts
6.000 μ F	0.001 μ F	$\pm 1.5\% \pm 5$ dgts
60.00 μ F	0.01 μ F	$\pm 2.0\% \pm 5$ dgts
490.0 μ F	0.1 μ F	$\pm 3.5\% \pm 5$ dgts

¹ for reading less than 150 counts (least significant digits), add additional 15 digits to the specified accuracy.

Capacitance:(\pm , manual range, and for film capacitor or better)

Range	Resolution	Accuracy ¹
99.99nF	0.01nF	$\pm 0.8\% \pm 5$ dgts
999.9nF	0.1nF	$\pm 1.5\% \pm 5$ dgts
9.999 μ F	1 μ F	$\pm 1.5\% \pm 5$ dgts
99.99 μ F	0.01 μ F	$\pm 2\% \pm 5$ dgts
999.9 μ F	0.1 μ F	$\pm 3.5\% \pm 5$ dgts

¹ for reading less than 150 counts (least significant digits), add additional 15 digits to the specified accuracy.

Diode Test: (open voltage 3V approx., overload protection AC 1000V)

Range	Resolution	Accuracy	Short Circuit Current
3.0000V	0.0001V	$\pm 2\% \pm 5$ dgts	0.8 mA typical

Frequency: (TTL)

Range (Auto)	Resolution	Accuracy	Overload Protection
1.000Hz – 2MHz	0.0001Hz 0.0001MHz	$\pm 0.005\% \pm 4$ dgts	AC 1000V

Duty Cycle: (% , TTL, 1Hz – 600KHz)

Range	Resolution	Accuracy	Overload Protection
0.001% - 9.999%	0.001%	± 30 d/KHz ± 30 dgts	AC 1000V
10.00% – 100.00%	0.01%	± 3 d/KHz ± 3 dgts	AC 1000V

Frequency: (AC sine wave)

Range	Resolution	Accuracy	Overload Protection
1.0000Hz– 200KHz	0.0001Hz–100Hz	±0.02%±4dgts	AC 1000V

Sensitivity (Sine wave)

100mV min @ mV range


1 V min @ V range

Duty Cycle: (% , Sine Wave)

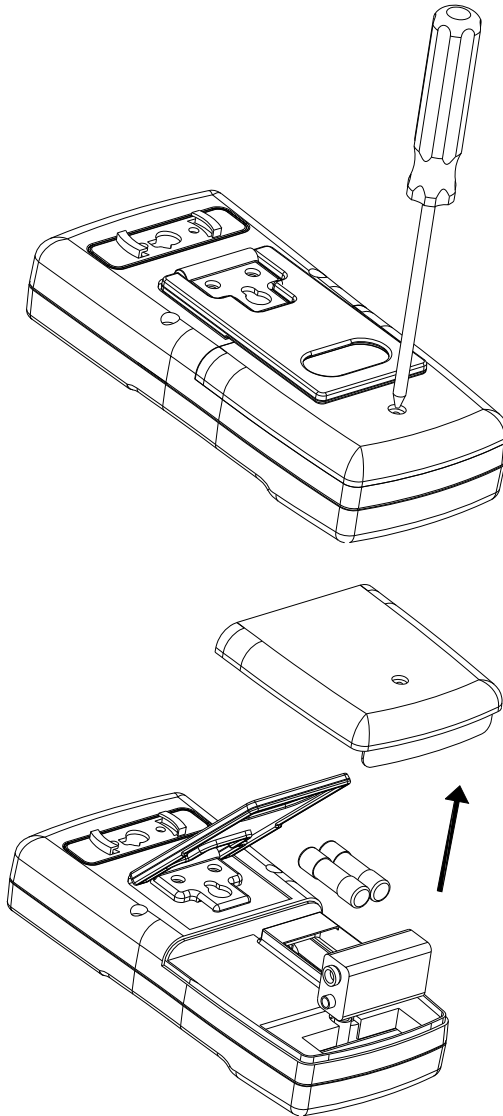
Range	Resolution	Accuracy	Overload Protection
0.001% – 100.00%	0.001% – 0.01%	Not specified	AC 1000V

General Specification

Indoor User

Battery Type:	9V
Fuse:	Fast 20A/1000V (A terminal) Fast 1A/1000V(mA / μ A terminal)
Display:	5 + 5 digits LCD with 30 segments bar graph
Range Selection:	auto and manual
Overload Indication:	OL
Power Consumption:	6 mA (approx.)
Low battery Indication:	
Operating Temperature:	-10°C to 40°C
Operating Humidity:	less than 85% relative
Altitude:	up to 2000M
Storage Temperature:	-20°C to 60°C
Storage Humidity:	less than 75% relative
Dimension:	207mm(L) x 101mm (W) x 47mm (H) 8.15" (L) x 4" (W) x 1.85" (H)
Weight:	430g / 15.2oz (battery included)
Accessories:	Users manual x 1 9V battery x 1 RS-232C interface cable

5. Battery and Fuse Replacement



Remove any test leads before removing the battery cover.

Users will see the battery and fuses. Replace the old ones with new battery or fuses. Replace the battery cover.

6. Maintenance & Cleaning

Only qualified personnel should perform servicing not covered in this manual. Only Qualified personnel should perform repairs.

Periodically wipe the case with a damp cloth and mild detergent; do not use abrasives or solvents.

Address of Agent, Distributor, Importer, or Manufacturer

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