



1. ELECTRICAL SPECIFICATIONS

Accuracy is given as \pm (% of reading + no. of least significant digits) at $23^{\circ}\text{C} \pm 5^{\circ}\text{C}$, with relative humidity Less than 80% R.H.

DC VOLTAGE

Range	Resolution	Accuracy	Overload Protection
999.9mV	0.1mV	$\pm(0.2\%rdg+5dgt)$	1000V RMS
9.999V	1mV	$\pm(0.1\%rdg+2dgt)$	
99.99V	10mV		
999.9V	0.1V	$\pm(0.4\%rdg+5dgt)$	

Input Impedance: $10\text{M}\Omega$ ($15\text{M}\Omega$ nominal for 999.9mV range)

AC VOLTAGE (TRUE RMS: From 5% to 100% of range.)

Range	Resolution	Accuracy			Overload Protection
		40~200 Hz	200~500Hz	500Hz~2kHz	
999.9mV	0.1mV	$\pm(2.5\%rdg+5dgt)$	No spec.	No spec.	1000V RMS
9.999V	1mV	$\pm(1.1\%rdg+6dgt)$	$\pm(1.1\%rdg+6dgt)$	$\pm(2.0\%rdg+6dgt)$	
99.99V	10mV	$\pm(1.1\%rdg+5dgt)$	$\pm(1.1\%rdg+5dgt)$	$\pm(2.0\%rdg+5dgt)$	
1000.0V	0.1V			NO spec.	

Input Impedance: $10\text{M}\Omega$ // less than 100pF ($15\text{M}\Omega$ nominal for 999.9mV range).

Crest factor: ≤ 3

*For lower than 5.0mV, the specification will add 45dgt to specified accuracy.

HARMONICS RATIO

Range	0.0% to 99.9%
Voltage	100mV to 1000VAC

Harmonics Ratio 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 Ratio of 0%. The higher Harmonics Ratio, the more harmonics are present.

DIODE CHECK

Range	Resolution	Accuracy	Test Current	Test Voltage
Diode	1 mV	$\pm(1.0\%rdg+2dgt)$	approx. 0.7mA	<3.3V

Overload protection: 600V RMS

AUDIBLE CONTINUITY TEST

Range	Resolution	Accuracy	Test Current	Test Voltage
Diode	1 mV	Built-in buzzer sounds when reading is below approx. 100 mV	approx. 0.7mA	<3.3V

Overload protection: 600V RMS



RESISTANCE

Range	Resolution	Accuracy	Maximum Test Voltage	Overload Protection
400Ω	0.1 Ω	±(0.5%rdg+3dgt)	3.3V	600V RMS
4kΩ	1 Ω			
40kΩ	10Ω			
400kΩ	100Ω			
4MΩ	1kΩ	±(0.8%rdg+3dgt)	1.28V	
40MΩ	10kΩ	±(1.2%rdg+3dgt)		

Instant Continuity: Built-in buzzer sounds when resistance is less than 10.0Ω

CAPACITANCE

Range	Resolution	Accuracy *N	Overload Protection
4.000 μF	1nF	±(2%rdg+4dgt)	600V RMS
40.00 μF	0.01μF		
400.0 μ F	0.1μF	±(3.5%rdg+4dgt)	
9999μF	10μF	±(3.5%rdg+5dgt), >2mF, NO Spec.	

Note: The accuracy is based on the film capacitor or better. Using Relative mode to zero residual.

DC CURRENT

Range	Resolution	Accuracy	Burden Voltage and shunt	Overload Protection
400 μA	0.1 μA	±(0.2%rdg+3dgt)	0.04V (100Ω)	0.5A/660V (or 700V) Quick Acting Fuse
4000 μA	1 μA	±(0.1%rdg+3dgt)	0.4V (100Ω)	
40 mA	10 μA	±(0.2%rdg+3dgt)	0.08V (1Ω)	
400 mA	0.1 mA	±(0.1%rdg+3dgt)	0.8V (1Ω)	
4 A	1mA	±(0.3%rdg+3dgt)	0.3V (0.01Ω)	10 A/600 V Quick Acting Fuse
10 A	10mA	±(0.3%rdg+3dgt)	0.6V (0.01Ω)	

AC CURRENT (TRUE RMS: From 5% to 100% of range.)

Range	Resolution	Accuracy		Burden Voltage And shunt	Overload Protection
		40 ~ 500 Hz	500~2 kHz		
400 μA	0.1 μA	±(1%rdg+5dgt)	±(1.5%rdg+5dgt)	0.04V (100Ω)	0.5A/660V (or 700V) Quick Acting Fuse
4000 μA	1 μA			0.4V (100Ω)	
40 mA	10 μA			0.08V (1Ω)	
400 mA	0.1 mA			0.8V (1Ω)	
4 A	1mA			0.3V (0.01Ω)	10A/600V Quick Acting Fuse
10 A	10mA			0.6V (0.01Ω)	

Crest factor: <3



K -TYPE TEMPERATURE TEST

RANGE	Resolution	Accuracy(*)	V Maximum (**)
-40°C ~ 850°C	1°C	$\pm(0.3\%rdg+3^{\circ}C)$	30V RMS or 60V DC
-40°F ~ 1562°F	1°F	$\pm(0.3\%rdg+6^{\circ}F)$	

(*) Accuracy:

- $\pm 2.2^{\circ}C$ or $\pm 0.75\%$ of reading from $0^{\circ}C$ to $800^{\circ}C$ (whichever is greater)
- $\pm 2.2^{\circ}C$ or $\pm 2\%$ of reading from $0^{\circ}C$ to $-50^{\circ}C$ (whichever is greater)
- The accuracy does not include the tolerance of thermocouple probe.
- The accuracy of thermocouple probe is shows as below:
 Temperature Rating (wire): Continuous $204^{\circ}C$, Single reading $260^{\circ}C$
 Temperature Measuring Range: $-50^{\circ}C$ to $+800^{\circ}C$ (MAX).

(**) Do not allow the temperature sensor to contact a surface that is energized above 30 V RMS or 60 V DC, such voltages pose a shock hazard.

J -TYPE TEMPERATURE TEST

RANGE	Resolution	Accuracy	*V Maximum
-40°C ~ 650°C	1°C	$\pm(0.3\%rdg+3^{\circ}C)$	30V RMS or 60V DC
-40°F ~ 1202°F	1°F	$\pm(0.3\%rdg+6^{\circ}F)$	

FREQUENCY MEASUREMENT FOR VOLTAGE

Range	Resolution	Accuracy	Min. Input Freq.
9.999Hz	0.001Hz	$\pm(0.05\%rdg+4dgt)$	1Hz
99.99Hz	0.01Hz		
999.9Hz	0.1Hz		
9.999kHz	1Hz		
50.00kHz	10 Hz		

Overload protection: 1000V RMS

FREQUENCY SENSITIVITY

INPUT RANGE	MINIMUM SENSITIVITY			
(Max input for specified accuracy = 10 x Range or 1000V)	20Hz-40Hz (SINEWAVE); 10Hz-20kHz (SQUARE WAVE)	40Hz-5 kHz (SINEWAVE)	5kHz-15kHz (SINEWAVE)	15kHz-50 kHz (SINEWAVE)
999.9mV	0.7V	0.4V	0.7V	-----
9.999V	0.8V	0.8V	0.8V	3V
99.99V	8V	8V	8V	30V
999.9V	120V	80V	120V	-----
400.0μA	50μA (20Hz~10kHz Sinewave); 10Hz-20kHz (Square wave)			
4.000mA	0.3mA (20Hz~10kHz Sinewave); 10Hz-20kHz (Square wave)			
40.00mA	5mA (20Hz~10kHz Sinewave); 10Hz-20kHz (Square wave)			
400.0mA	30mA (20Hz~10kHz Sinewave); 10Hz-20kHz (Square wave)			
4.000A	0.5A (20Hz~10kHz Sinewave); 10Hz-20kHz (Square wave)			
10.00A	3A (20Hz~10kHz Sinewave); 10Hz-20kHz (Square wave)			



2. GENERAL SPECIFICATIONS

Display:

- The liquid crystal display (LCD) is 4 digits with maximum reading 4,000/9,999 counts.
- 41 segments analog bar graph and full annunciator
- Automatic polarity indication.


Function:

- DCV, ACV, DCA, ACA, OHM, Diode check, Audible continuity, Capacitor, Temperature, % of 4~20mA and Frequency tests.
- TRUE RMS measurement for non-linear load measurement.
- Harmonics ratio measurement.
- The thermocouple types can be selected for K and J.

Measuring rate:

- 3 times per second.
- 1 time per second for frequency measurement.
- 0.2 ~ 10 seconds per time for Capacitance test.

Low battery indicator:

- The "  " appears when the battery voltage drops below 6.3V~7.5V (approx.).

Operating temperature:

- 0°C to 40 °C, 0 - 80 % R.H.

Storage temperature:

- -20°C to 60°C, 0 - 80 % R.H.

General informations:

- Indoor use
- Altitude up to 2000m
- Pollution degree: 2
- Insulation: class 2 (double insulation)

Power supply:

- Single standard NEDA1604, JIS006P, IEC6F22 carbon-zinc or alkaline type 9V battery.

Dimension:

- 58 (H) * 83 (W) * 178 (L) mm.

Weight:

- 400 grams with batteries included.

Applied standards:

- LVD: EN 61010-1 CAT III 600V CAT II 1000V
- EMC: EN60326

This product conforms to the prescriptions of the European directive on low voltage 2006/95/EEC and to EMC directive 2004/108/EEC