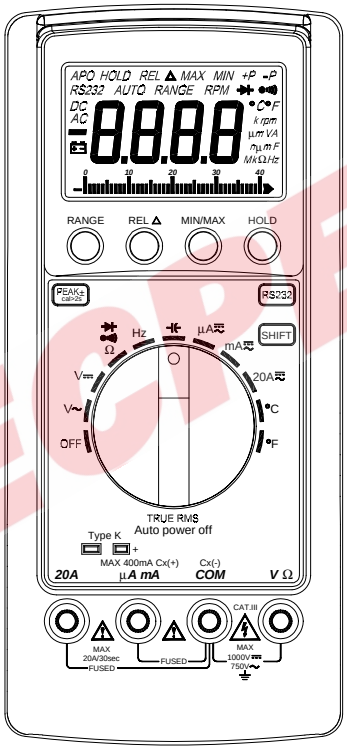
OPERATING INSTRUCTIONS

DIGITAL MULTIMETER



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INTRODUCTION

This manual contains information and warnings which must be followed to ensure safe operation and retain the meter in safe condition.

WARNING
READ "SAFETY INFORMATION" BEFORE USING THE METER.

This multimeter is a handheld, 4000-count instrument that is designed for use in the laboratory, field servicing, and at home. The meter combines the precision of a digital multimeter with the high speed and versatility of a analog display. This meter features compact design with rounded corners for easy handling and has a rugged case in shock resistant and fire-retardant. Electronic overload protection for all functions and ranges. The Protective Holster (optional accessory) combined with rugged case make it a durable and reliable instrument.

UNPACKING AND INSPECTION

Upon removing your new Digital Multimeter (DMM) from its packing, you should have the following items:

1. Digital Multimeter
2. Test Lead Set (one black, one red)
3. 9-Volt Battery (installed in meter)
4. K Type beaded wire thermocouple
5. Instruction Manual
6. One Spare Fuse (500mA/500V, 6.3mm × 32mm, fast acting)
7. One RS232 cable, a PC software disk.

If any of the above items are missing or are received in a damaged condition, please contact the distributor from whom you purchased the unit.

SAFETY INFORMATION

The following safety precautions must be observed to ensure maximum personal safety during the operation, service and repair of this meter:

1. Read these operating instructions thoroughly and completely before operating your meter. Pay particular attention to WARNINGS which will inform you of potentially dangerous procedures. The instructions in these warnings must be followed.
2. Always inspect your meter, test leads and accessories for any sign of damage or abnormality before every use. If any abnormal conditions exist (e.g.-broken test leads, cracked cases, display not reading, etc.), do not attempt to take any measurements.
3. Do not expose the instrument to direct sun light, extreme temperature or moisture.
4. Never ground yourself when taking electrical measurements. Do not touch exposed metal pipes, outlets, fixtures, etc., which might be at ground potential. Keep your body isolated from ground by using dry clothing, rubber shoes, rubber mats, or any approved insulating material.
5. To avoid electric shock use CAUTION when working with voltages above 40Vdc or 20Vac. Such voltages pose a shock hazard.
6. Never exceed the maximum allowable input value of any function when taking a measurement. Refer to the specifications for maximum inputs.
7. Never touch exposed wiring, connections or any live circuit when attempting to take measurements.
8. Do not attempt to operate this instrument in an explosive atmosphere (i.e. in the presence of flammable gases or fumes, vapor or dust).
9. When testing for the presence of voltage, make sure the voltage function is operating properly by reading a known voltage in that function before assuming that a zero reading indicates a no-voltage condition. Always test your meter before and after taking measurements on a known live circuit.
10. Calibration and repair of any instrument should only be performed by qualified and trained service technicians.
11. Do not attempt calibration or service unless trained and another person capable of rendering first aid and resuscitation is present.
12. Remember: Think Safety, Act Safely.

SAFETY INFORMATION

The instrument complies with class II, overvoltage CAT.III 1000V of the IEC 1010-1 (EN61010-1); UL3111-1; and CAN-CSA C22.2 No. 1010.010-30 standards. Pollution degree 2 in accordance with IEC-664 indoor use. If the equipment is used in a manner not specified, the protection provided by the equipment may be impaired.

⚠ ▣ When servicing, use only specified replacement parts or equivalent.

⚠ WARNING: To avoid electric shock disconnect measuring terminals before removing battery cover.

⚠ AVIS: Pour eviterle le choc electrique, debrancherles bornes de mmeaure avant d'enlever le capotage arriere.

The symbols used on this instrument are:

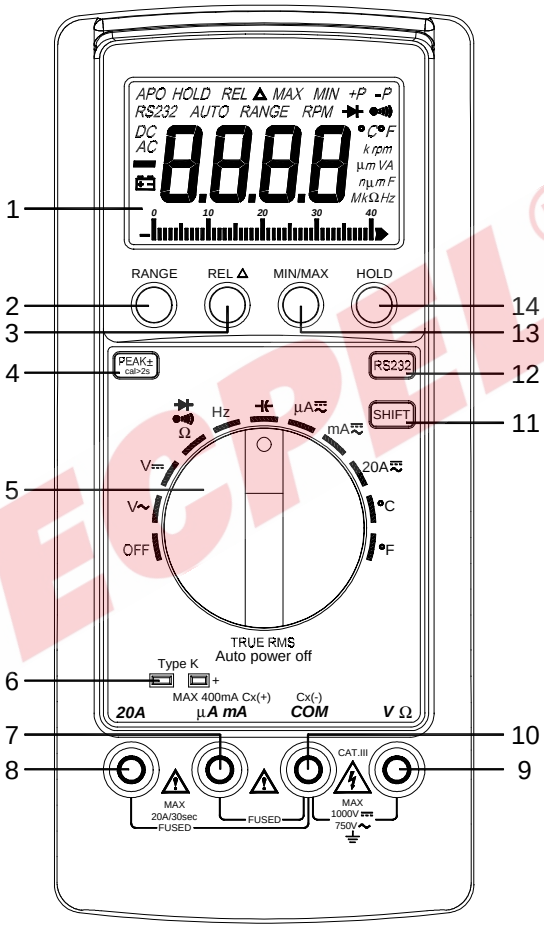
- ⚠ Caution, risk of electric shock
- ⚠ Caution, refer to accompanying documents
- ▣ Equipment protected throughout by Double insulation (Class II)
- ~ Alternating current
- ⎓ Direct current
- ⏚ Ground

CE

This product complies with the requirements of the following European Community Directives: 89/336/EEC (Electromagnetic Compatibility) and 73/23/EEC (Low Voltage) as amended by 93/68/EEC (CE Marking).

However, electrical noise or intense electromagnetic fields in the vicinity of the equipment may disturb the measurement circuit. Measuring instruments will also respond to unwanted signals that may be present within the measurement circuit. Users should exercise care and take appropriate precautions to avoid misleading results when making measurements in the presence of electromagnetic interference.

INSTRUMENT LAYOUT



1. **Display.** 3-3/4 digit (3999 maximum) with automatic decimal point analog bar graph, low battery and full annunciators for function and unit of measurement.

2. **RANGE Button**
   Press (RANGE) button to select the Manual Range mode and turn off the "AUTO" annunciator. (The meter remains in the range it was in when manual ranging was selected).
   In the Manual Range mode, each time you press (RANGE) button, the range (and the input range annunciator) increments, and a new value is displayed. To exit the Manual Range mode and return to autoranging, press and hold down (RANGE) button for 2 seconds. The "AUTO" annunciator turns back on.

3. **REL Δ Button**
   When the REL Δ button is pressed the present reading become the zero reading and all subsequent readings are displayed relative to this value. This function is cleared by pressing the REL Δ button > 1 sec which returns the meter to normal operation.

4. **PEAK± Button**
   Record the peak+ or peak- value in a measurement. It is usable with AC/DC voltage, AC/DC current measurements. If the pressed time > 2 sec, the PEAK function will enter to calibration mode, the LCD will show "CAL" and the internal buffer will remember the internal OP off set voltage then back to the measure mode. Response time: More than 1 ms.

5. **Function / Range Selector Rotary Switch**
   This rotary switch selects function and range needed. Each time the rotary switch is moved from OFF to a function setting, all LCD segments will turn on for one second.

6. **Temperature Jack**
The temperature jack is located in the lower left-hand corner of the front panel. To measure a wide range of temperature (-50°C to +1300°C), plug in a K-type thermocouple and take the reading direct from the digital display.

7. **CX (+) / mA µA Input Terminal**
This is the positive input terminal for current measurement (ac or dc) up to 400mA. Capacitance measurement up to 40mF. Connection is made to it using the Red test lead.

8. **20A 20 Amperes Input Terminal**
This is the positive input terminal for current measurement (ac or dc) up to 20A. Connection is made to it using the Red test lead.

9. **V** W **Hz** ⊣◀
This is the positive input terminal for all functions except current capacitance measurements. Connection is made to it using the red test lead.

10. **COM Common Terminal**
This is the negative (ground) input terminal for all measurement modes. Connection is made to it using the Black test lead.

11. **Shift Boutton.** Shift DCA/ACA, W **/** •)) / ⊣◀ function.

12. **RS232 Button**
Press the button to show “RS232” annunciator on LCD and to start sending data to computer being connected.

13. **MAX/MIN Button**
The MAX/MIN button activates saving the maximum and minimum readings for display in the LCD. Press MAX/MIN once and the MAX reading will display and be updated with each new maximum reading. Press MAX/MIN again and the minimum reading will be displayed in the same manner as the maximum.

Press the button a third time and both MAX and MIN indicators blink, indicating that the meter is still saving both maximum and minimum readings, but is displaying the real-time reading. Each successive press of MAX/MIN permits looking at either value or the real-time reading. To disable MAX/MIN, press and hold the MAX/MIN button for 2 seconds. The LCD indicators will disappear and the meter will read real-time only.

14. HOLD Button

Press (HOLD) button to toggle in and out of the Data Hold mode. In the Data Hold mode, the "HOLD" annunciator is displayed and the last reading is frozen on the display. Press the (HOLD) button again to exit and resume readings.

15. Other Functions

• AUTO POWER OFF

1. The meter will automatically shut off if the Function/Range switch position is not changed within 30 minutes.
2. The auto power off mode is activated with an "APO" symbol indicating on LCD.
3. After auto power off, press any button on DMM (except HOLD button), or change range position of the rotary knob to turn the DMM back on again.
4. Disable auto power off, set the DMM to off position, press any button (except the HOLD button) on DMM, and hold the button while turning the rotary knob to the desired range position. Release the button when LCD displays normally. Note "APO" annunciator is missing form the LCD.

- **INPUT WARNING BEEPER**

  The Input Warning Beeper is a feature to protect the meter and you from unintentional misuse. If the DMM is set to measure a voltage while the test leads are plugged into a current jack, very high current could result when the test lead tips are placed to the voltage test point.

  This feature warns you that the test lead needs to be changed from a current jack to the voltage jack.
  All current ranges are fused with fast acting ceramic fuses as an added protection.

- **True RMS Measurements**

  This multimeter permits direct measurement of the true RMS value of a signal. This is the best way to measure parameters used for measurements relating to power.
  The relationship between the total true RMS (AC+DC) and the component AC and DC signals is given by the following expression:

  $$\text{True RMS} = \sqrt{(\text{AC RMS Component})^2 + (\text{DC Component})^2}$$

  RMS is equivalent to that DC value which dissipates the same amount of power in a resistor as the original signal and can be visualized by the relationships

  $$\text{Power} = \frac{VRMS^2}{R} = \frac{VDC^2}{R}$$

  " Average-responding " meters provide accurate RMS readings for sinusoidal signals, but can introduce significant errors when measuring nonsinusoidal waveforms.

The following table shows the errors that result when the average-responding measurement is used instead of the True RMS value.

Power Calculations (watts) from Voltage Measurements (Vpk=100V, Load=1kΩ resistor)			
	AC RMS average responding	AC True RMS	Error
Sine wave	5.0	5.0	0%
Square wave	12.3	10.0	+23%
Triangle wave	3.1	3.1	-6%

This multimeter is AC coupled and will accurately measure the AC RMS component of an input signal. The DC voltage function will measure the DC component. To obtain the total true RMS value, measure the RMS AC component on the AC function and the DC component on the DC function. Then, calculate the True RMS value, using the measured AC and DC components and the True RMS expression given above.

AC converters of all types are limited by their frequency response and input dynamic range. Measurements of complex waveforms will not be affected by converter bandwidth limitations, provide that all significant AC components contained within the waveforms are within the bandwidth of the converter.

Crest factor is a measure of the input dynamic range of an AC converter. It expresses the ability of the converter to accept a signal that has large peak values compared to its RMS value without saturating the converter circuitry and degading the specified accuracy. Crest factor is defined as the ratio of the peak voltage to the total AC RMS voltage.

$$\text{Crest Factor} = \frac{\text{V (PEAK)}}{\text{V (AC RMS)}}$$

HOW TO MAKE MEASUREMENTS

Before making any measurements always examine the instrument and accessories used with the instrument for damage, contamination (excessive dirt, grease, ect.) and defects. Examine the test leads for cracked or frayed insulation and make sure the lead plugs fit snugly into the instrument jacks. If any abnormal conditions exist do not attempt to make any measurements.

VOLTAGE MEASUREMENTS

1. Insert the black and red test leads into the COM and V-Ω input terminals respectively.

2. Select the desired AC voltage range (V ~), or DC voltage range (V ⎓).

WARNING

To avoid possible electric shock, instrument damage and / or equipment damage, do not attempt to take any voltage measurements if the voltage is above 1000Vdc / 750Vac. 1000Vdc and 750Vac are the maximum voltages that this instrument is designed to measure. The "COM" terminal potential should not exceed 500V measured to ground.

3. Connect the test lead tips in parallel with the circuit to be measured (e.g. across a load or power supply). Be careful not to touch any energized conductors. Note the reading.

4. When all measurements are completer, disconnect the test leads from the circuit under test. Remove test leads from the multimeter.

   For DC voltage readings, the RED lead tip should be connected to the positive side of the circuit, the BLACK lead to the negative side.

A minus sign on the left hand side of the LCD will appear if the leads are connected the other way round.

CURRENT MEASUREMENTS

These are made in series with the test circuit. All the current to be measured flows through the multimeter.

WARNING

Do not attempt to measure currents in high energy circuits capable of delivering greater than 600V. Since the fuse is rated at 600V damage or injury could occur. The 20A input terminal is protected by a 20A/600V high energy, fast blow fuse. The mA input terminal is protected by a 500mA/500V fast blow fuse.

Do not exceed the limits of each current input terminal. This is 20A (maximum time limit of 30 seconds for currents greater than 10A) for the 20A terminal and 400mA for the mA terminal.

All current rages are fused. If a current greater than 20A on the 20A range or greater than 500mA on all other ranges flows, the fuse will blow causing an open circuit between the current measuring terminals.

1. Insert the BLACK test lead in the COM input terminal.
2. For measuring currents less than 400mA, connect the RED test lead to the mA input terminal. For measuring currents between 400mA and 20A connect the RED test lead to the 20A terminal.
3. Select the desired AC current range or DC current range.
   NOTE: If the 20A range is selected then the 20A input terminal must be selected in step 2. If the µA, mA ranges is selected the mA input terminal must be selected in step 2.

4. Switch OFF or disconnect the circuit to be measured from all power sources, connect the multimeter in series with the conductor in which the current to be measured flows.

5. Switch ON the circuit. Note the reading.

6. Switch OFF or disconnect the circuit and remove the test leads from multimeter.

CAUTION

A common abuse of multimeters in to attempt to measure a voltage while the test leads are still plugged into the current input terminals. This basically puts a short circuit across the voltage source since current ranges have a low impedance. If the voltage source is typically 240VAC or a 3-phase industrial voltage (415V), very high fault currents can result. This is why all current input terminal are fused. If the fuses blow they must only be replaced by the equivalent ones otherwise the safety of the instrument may be impaired.

7. Never apply a voltage between the COM terminal and current terminals.

8. When switching between current ranges to obtain greater accuracy and better resolution, completely de-energize the circuit to be measured before changing the range.

RESISTANCE MEASUREMENTS

CAUTION

Turn off power on the test circuit and discharge all capacitors before attempting in-circuit resistance measurements. If an external voltage is present across a component, it will be impossible to take an accurate measurement of the resistance of that component.

1. Insert the BLACK and RED test leads into the COM and VΩ input terminals respectively.

2. Set the rotary selector switch to the (Ω) position.

3. Connect the BLACK and RED test probe tips to the circuit or device under test, making sure it is de-energized first.

4. The resistance in the test leads can diminish accuracy on the lowest (400Ω) range. The error is usually 0.1 to 0.2Ω for a standard pair of test leads. To determine the error, short the test leads together and then use the (REL) Relative mode to automatically subtract the lead resistance from resistance measurements.

CONTINUITY TESTING

1. Select the (•)) position by turning the rotary selector switch.

2. Follow steps 1 and 3 as for resistance measurements. An audible tone will sound for resistance less than approximately 40Ω. After all measurements are completed, disconnect the test leads from the circuit and from the multimeter input terminals.

DIODE TESTING

CAUTION
Measurements must only be made with the circuit power OFF.

1. Set the rotary selector switch to the (→|) position.

2. Follow steps 1 and 3 as for resistance measurements.

3. The RED lead should be connected to the anode and the BLACK lead to the cathode. For a silicon diode, the typical forward voltage should be about 0.6V.

FREQUENCY MEASUREMENTS

1. Set the Function/Range switch to Hz for frequency measurement.
2. Connect the red test lead to the →|← **V** W **Hz jack** and the black test lead to the **COM** jack.
3. Connect the test leads to the point of measurement and read the frequency from the display.

CAPACITANCE MEASUREMENTS

CAUTION

Turn off power and discharge the capacitor before attempting a capacitance measurement. Use the DCV function to confirm that the capacitor is discharged.

1. Set the **Function/Range** switch to ⊣⊢ (capacitance).
2. Connect the COM and the Cx (+) µA mA leads to the capacitor. Observe polarity when measureing polarized capacitors.
3. Read the capacitance directly from the display. A shorted capacitor will indicate an overrange. An open capacitor will indicate near zero on all ranges.
4. For maximum accuracy, step to the desired range in manual ranging, then press the REL Δ button to zero out test lead capacitance before the measurement.
5. The bar graph is disabled in capacitance measurement mode.
6. In 4mF and 40mF ranges, the bar graph on LCD will be in action vack and forth. The is a charging mode during, not a indication of the measured reading.

7. When the capacitor to be tested is connected, if “disc” symbol indicates on LCD, it means there is voltage existing the tested capacitor and need to be discharged before testing.

TEMPERATURE MEASUREMENTS

1. Select the required temperature range and unit of measurement (°C or °F) by turning the rotary selector dial to one of the “TEMP” positions.

2. Connect a type K thermocouple to the thermocouple input terminal (yellow terminal) on the left hand side of the front panel.

3. Place the thermocouple junction tip at the point where the temperature is to be measured.

NOTE: for very high temperatures the multimeter must be kept far enough away from the source of temperature to avoid heat damage. At high temperatures, the life of the temperature probe will be reduced.

RS232 OPERATING

1. Connect the DMM to the PC using the serial cable provided.

2. At the DMM, rotate the function selector switch to the range.

3. Press the RS232 button to activate the serial port output.

4. At the PC, open the DMM software by double-clicking on the icon the DMM directory or file folder. (Disk 1 and Disk 2).

5. Operating system: Ms windows versions WIN95 or WIN98.

6. Operations of RS232 software
   Please refer to operations of each function described in the software.

SPECIFICATIONS

- **Display:** 3¾ digit (4000 counts), 42 segments analog bar graph and function/units sign annunciators.
- **Polarity:** Automatic, (-) negative polarity indication.
- **Overrange indication:** (OL) or (-OL) is displayed.
- **Low battery indication:** The "🔋" is displayed when the battery voltage drops below accurate operating level.
- **Measurement rate:** 2/sec, nominal; Bar graph: 20/sec nominal.
- **Operating environment:** 0°C to 50°C at < 70% **R.H.**
- **Storage temperature:** -20°C to 60°C, 0 to 80% **R.H.** with battery removed from meter.
- **Temperature coefficient:** 0.1 × (specified accuracy) / °C (0°C to 18°C or 28°C to 50°C).
- **Auto power off:** 30 minutes after rotary switch or mode changes.
- **Altitude:** 6561.7 feet (2000M)
- **Battery:** Single 9Volt battery, NEDA 1604, IEC 6F22, JIS 006P.
- **Battery life:** 500 hours typical with alkaline battery.
- **Size (H×W×D):** 7.8×3.6×1.7 inches (198×90×44mm)
- **Weight:** Approx. 14.1 oz (400 g) including battery.

*Accuracy is given as ±([% of reading] + [number of least significant digits]) at 18°C to 28°C, with relative humidity up to 70%.

DC Volts

Range	Resolution	Accuracy	Input Impedance
400mV	100µV	±(0.1% rdg + 2 d)	>100MΩ
4V	1mV	±(0.1% rdg + 2 d)	10MΩ
40V	10mV	±(0.1% rdg + 2 d)	9.1MΩ
400V	100mV	±(0.1% rdg + 2 d)	9.1MΩ
1000V	1V	±(0.1% rdg + 2 d)	9.1MΩ

Overload Protection: 1000VDC / 750VAC RMS

AC Volts (TRUE RMS)

Range	Resolution	Accuracy(50Hz to 500Hz)	500Hz to 1kHz
400mV	100µV	* ±(1.2% rdg + 5 d)	Unspecified
4V	1mV	±(1.0% rdg + 3 d)	±(1.5% rdg + 5 d)
40V	10mV	±(1.0% rdg + 3 d)	±(1.2% rdg + 5 d)
400V	100mV	±(1.0% rdg + 3 d)	±(1.2% rdg + 5 d)
750V	1V	±(1.2% rdg + 5 d)	±(1.5% rdg + 5 d)

* The frequency response for 400mV range are 50Hz to 100Hz only
Input Impedance: Same as DCV function with less than 100pF
Crest factor: ≤ 3
Overload Protection: 1000VDC or 750VAC RMS

DC Current

Range	Resolution	Accuracy	Burden Voltage
400µA	0.1µA	±(1.0% rdg + 1 d)	500mV max.
4mA	1µA	±(1.0% rdg + 1 d)	2.0V max.
40mA	10µA	±(1.0% rdg + 1 d)	500mV max.
400mA	100µA	±(1.0% rdg + 1 d)	2.0V max.
20A**	10mA	±(2.0% rdg + 3 d)	500mV max.

Overload Protection: 500mA/500V fuse on mA inputs (fast blow ceramic fuse). 20A/600V fuse on 20A inputs (fast blow ceramic fuse).
** 10A continuous, 20A for 30 seconds maximum.

AC Current (TRUE RMS)

Range	Resolution	Accuracy(50Hz to 500Hz)	Burden Voltage
400µA	0.1µA	±(1.5% rdg + 4 d)	500mV max.
4mA	1µA	±(1.5% rdg + 4 d)	2.0V max.
40mA	10µA	±(1.5% rdg + 4 d)	500mV max.
400mA	100µA	±(1.5% rdg + 4 d)	2.0V max.
20A**	10mA	±(2.5% rdg + 4 d)	500mV max.

Overload Protection: 500mA/500V fuse on mA inputs (fast blow ceramic fuse). 20A/600V fuse on 20A inputs (fast blow ceramic fuse).
** 10A continuous, 20A for 30 seconds maximum.
Crest factor: ≤ 3

Resistance

Range	Resolution	Accuracy	Open Circuit Volts
400Ω	0.1Ω	±(0.5% rdg + 4 d)	-1.2Vdc
4kΩ	1Ω	±(0.4% rdg + 2 d)	-0.45Vdc
40kΩ	10Ω	±(0.4% rdg + 2 d)	-0.45Vdc
400kΩ	100Ω	±(0.4% rdg + 2 d)	-0.45Vdc
4MΩ	1kΩ	±(0.7% rdg + 4 d)	-0.45Vdc
40MΩ	10kΩ	±(1.5% rdg + 4 d)	-0.45Vdc

Overload Protection: 500VDC or RMS AC

Continuity Test

Range	Audible Threshold	Response Time	Open Circuit Volts
400Ω	Less than 40Ω	Approx. 100ms	-1.2Vdc

Overload Protection: 500VDC or RMS AC

Diode Test

Range	Resolution	Accuracy	Test Current	Open Circuit Volts
4V	1mV	±(1.5% rdg + 3d)	1.2mA	3.0Vdc typical

Audible Indication: < 0.2V
Overload Protection: 500VDC or RMS AC

Capacitance

Range	Resolution	Accuracy *
4nF	1pF	±(3.0% rdg + 20 dgts)
40nF	10pF	±(3.0% rdg + 5 dgts)
400nF	100pF	±(3.0% rdg + 5 dgts)
4µF	1nF	±(3.0% rdg + 5 dgts)
40µF	10nF	±(3.0% rdg + 5 dgts)
400µF	0.1nF	±(5.0% rdg + 10 dgts)
4mF	1µF	±(5.0% rdg + 10 dgts)
40mF	10µF	±(5.0% rdg + 10 dgts)

Overload Protection: 500VDC or RMS AC
* Accuracy using relative mode to zero meter.

Frequency

Range	Resolution	Accuracy	Sensitivity
4kHz	1Hz	±(0.1% rdg + 3 dgts)	>1.0V rms
40kHz	10Hz		>1.0V rms
400kHz	100Hz		>1.0V rms
4MHz	1kHz		>2.0V rms <5V rms
40MHz	10kHz		>2.0V rms <5V rms

Minimum Pulse Width: >25 ns
Duty Cycle Limits: >30% and <70%
Overload Protection: 500VDC or RMS AC

Temperature

Range	Resolution	Accuracy
-50°C to 400°C	1°C	±(0.8% rdg + 2°C)
400°C to 1300°C	1°C	±(1.0% rdg + 2°C)
-58°F to 400°F	1°F	±(0.8% rdg + 4°F)
400°F to 2372°F	1°F	±(1.0% rdg + 4°F)

Overload Protection: 60VDC or 24VAC RMS

MAINTENANCE

Repairs or servicing not covered in this manual should only be performed by qualified personnel.

REPLACING THE BATTERY

WARNING

TO AVOID ELECTRICAL SHOCK, DISCONNECT THE TEST LEADS AND ANY INPUT SIGNALS BEFORE REPLACING THE BATTERY. REPLACE ONLY WITH SAME TYPE OF BATTERY.

This meter is powered by a NEDA type 1604 or equivalent 9-volt battery. When the multimeter displays the " " the battery must be replaced to maintain proper operation. Use the following procedure to replacing the battery:

1. Disconnect test leads from any live source, turn the rotary switch to OFF, and remove the test leads from the input terminals.
2. The case bottom is secured to the case top by three screws and two internal snaps (at the LCD end). Using a Phillips-head screwdriver, remove the three screws from the case bottom and turn the case over.
3. Lift the input terminal end of the case bottom until it gently unsnaps from the case top at the end nearest the LCD.
4. Remove battery and replace with a new equivalent 9-volt battery.
5. Replace the case bottom, ensuring that the two snaps on the case top (at the end near the LCD) are engaged. Reinstall the three screws.

REPLACING THE FUSE

WARNING

TO AVOID ELECTRICAL SHOCK, DISCONNECT THE TEST LEADS AND ANY INPUT SIGNALS BEFORE REPLACING THE FUSES. REPLACE ONLY WITH SAME TYPE OF FUSES. THE 20A INPUT TERMINAL IS PROTECTED BY A F20A, 600V HIGH ENERGY, FAST ACTING. THE mA INPUT TERMINAL IS PROTECTED BY A F500mA, 500V FAST ACTING FUSE.

Use the following procedure to examine or replace the meter's fuses:

1. Disconnect test leads from any live source, turn the rotary switch to OFF, and remove the test leads from the input terminals.

2. The case bottom is secured to the case top by three screws and two internal snaps (at the LCD end). Using a Phillips-head screwdriver, remove the three screws from the case bottom and turn the case over.

3. Lift the input terminal end of the case bottom until it gently unsnaps from the case top at the end nearest the LCD.

4. Remove blown fuse, replace with fuse of the same size and rating. Make sure the new fuse is centered in the fuse holder.

5. Replace the case bottom, ensuring that the two snaps on the case top (at the end near the LCD) are engaged. Reinstall the three screws.

NOTE

P/N: 7000-1650