

User's Manual

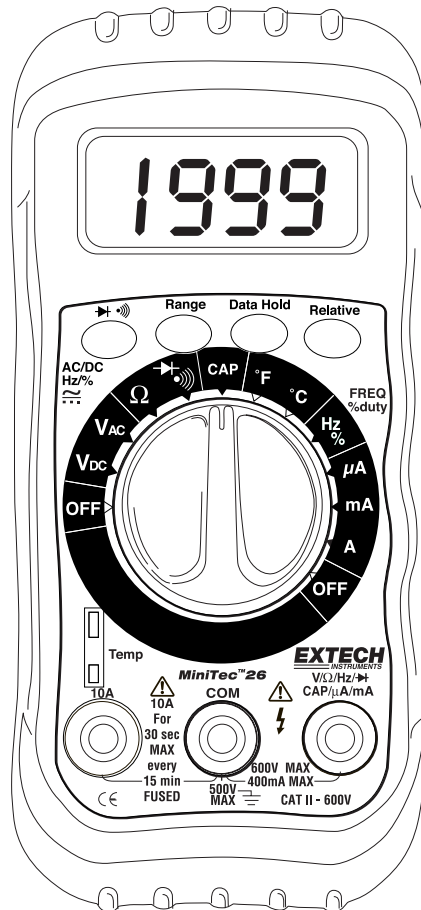


MiniTec™ Series

Model MN26

(Model MN26T includes temperature probe)

Mini Autoranging MultiMeter



Introduction

Congratulations on your purchase of Extech's MN26 Autoranging Multimeter. This meter measures AC/DC Voltage, AC/DC Current, Resistance, Capacitance, Frequency, Duty Cycle, Temperature, Diode Test and Continuity. Proper use and care of this meter will provide many years of reliable service.

Safety

International Safety Symbols



This symbol, adjacent to another symbol or terminal, indicates the user must refer to the manual for further information.



This symbol, adjacent to a terminal, indicates that, under normal use, hazardous voltages may be present



Double insulation

Safety Precautions

1. Improper use of this meter can cause damage, shock, injury or death. Read and understand this user manual before operating the meter.
2. Make sure any covers or battery doors are properly closed and secured.
3. Always remove the test leads before replacing the battery or fuses.
4. Inspect the condition of the test leads and the meter itself for any damage before operating the meter. Repair any damage before use.
5. Do not exceed the maximum rated input limits.
6. Use great care when making measurements if the voltages are greater than 25VAC rms or 35VDC. These voltages are considered a shock hazard.
7. Always discharge capacitors and remove power from the device under test before performing Capacitance, Diode, Resistance or Continuity tests.
8. Remove the battery from the meter if the meter is to be stored for long periods.
9. To avoid electric shock, do not measure AC current on any circuit whose voltage exceeds 250V AC.
10. Voltage checks on electrical outlets can be difficult and misleading because of the uncertainty of connection to the electrical contacts. Other means should be used to ensure that the terminals are not "live".

Specifications

Function	Range	Resolution	Accuracy
DC Voltage (V DC)	400mV	0.1mV	$\pm(0.5\% \text{ reading} + 2 \text{ digits})$
	4V	0.001V	$\pm(1.0\% \text{ reading} + 2 \text{ digits})$
	40V	0.01V	
	400V	0.1V	
	600V	1V	$\pm(1.5\% \text{ reading} + 2 \text{ digits})$
AC Voltage (V AC) (40 - 400Hz) (40 - 200Hz for 400mV, 4V ranges)	400mV	0.1mV	$\pm(2.0\% \text{ reading} + 30 \text{ digits})$
	4V	0.001V	$\pm(1.5\% \text{ reading} + 3 \text{ digits})$
	40V	0.01V	
	400V	0.1V	
	600V	1V	$\pm(2.0\% \text{ reading} + 4 \text{ digits})$
DC Current (A DC)	400 μ A	0.1 μ A	$\pm(1.5\% \text{ reading} + 3 \text{ digits})$
	4000 μ A	1 μ A	
	40mA	0.01mA	
	400mA	0.1mA	
	10A	0.01A	$\pm(2.5\% \text{ reading} + 5 \text{ digits})$

Function	Range	Resolution	Accuracy
AC Current (A AC) (40 - 400Hz) (40 - 200Hz for 400μA, 4mA ranges)	400μA	0.1μA	±(1.8% reading + 5 digits)
	4000μA	1μA	
	40mA	0.01mA	
	400mA	0.1mA	
	10A	0.01A	±(3.0% reading + 7 digits)
Resistance	400Ω	0.1Ω	±(1.2% reading + 4 digits)
	4kΩ	0.001kΩ	±(1.2% reading + 2 digits)
	40kΩ	0.01kΩ	
	400kΩ	0.1kΩ	
	4MΩ	0.001MΩ	
	40MΩ	0.01MΩ	
Capacitance	4nF	0.001nF	±(5.0% reading + 10digits)
	40nF	0.01nF	±(5.0% reading + 7 digits)
	400nF	0.1nF	±(3.5% reading + 5 digits)
	4μF	0.001μF	
	40μF	0.01μF	
	200μF	0.1μF	±(5.0% reading + 5 digits)
Frequency	9.999Hz	0.001Hz	±(1.5% reading + 5 digits)
	99.99Hz	0.01Hz	
	999.9Hz	0.1Hz	±(1.2% reading + 2 digits)
	9.999kHz	0.001kHz	
	99.99kHz	0.01kHz	
	999.9kHz	0.1kHz	
	9.999MHz	0.001MHz	±(1.5% reading + 4 digits)
	Sensitivity: 0.8V rms min. @ 20% to 80% duty cycle and <100kHz; 5Vrms min @ 20% to 80% duty cycle and > 100kHz.		
	Duty Cycle	0.1 to 99.9%	0.1%
Temp °F	-4 to 1400°F*	1°F	±(3.0% reading + 3 digits)
Temp °C	-20 to 760°C*	1°C	(probe effect additional)

NOTE: Accuracy is stated at 65°F to 83°F (18°C to 28°C) and less than 70% RH.

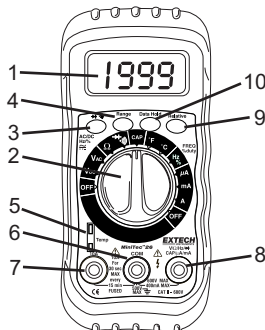
NOTE: Temperature range of the temperature probe may be less than the range of the meter.

Input Limits	
Function	Maximum Input
V DC, VAC	600V DC/AC
Ohms, Capacitance, Diode, Frequency, Continuity	250V DC/AC
mA DC/AC	400mA DC/AC
10A DC/AC	10A DC/AC (30sec. max)

Diode Test	Test current of 0.3mA maximum, open circuit voltage 1.5V DC typical
Continuity Check	Audible signal will sound if the resistance is less than approximately 30Ω, test current <0.7mA
Input Impedance	7.5MΩ (VDC and VAC)
Display	4000 count LCD
Overrange indication	"OL" is displayed
Polarity	Automatic (no indication for positive polarity); Minus (-) sign for negative polarity.
Measurement Rate	2 times per second, nominal
Auto Power Off	Meter automatically shuts down after 15 minutes of inactivity
Low Battery Indication	"BAT" is displayed
Batteries	Requires two AAA batteries
Fuses	mA, μA ranges, 0.5A/250V fast blow 10A range, 10A/250V fast blow
Operating Temperature	32°F to 122°F (0°C to 50°C)
Storage Temperature	-4°F to 140°F (-20°C to 60°C)
Relative Humidity	<70% operating, <80% storage
Operating Altitude	7000ft (2000 meters) maximum.
Weight	9.17 oz. (260g).
Size	4.78" x 2.38" x 1.57" (121.5mm x 60.6mm x 40mm)
Safety	For indoor use and in accordance with Overvoltage Category II, Pollution Degree 2. Category II includes local level, appliance, portable equipment, etc., with transient overvoltages less than Overvoltage Category III.





Meter Description

1. LCD Display
2. Function switch
3. Function key
4. Range key
5. Temperature jack
6. COM jack
7. 10A jack
8. Positive jack
9. Relative key
10. Data Hold key



Note: Tilt stand, fuse and battery compartment are on rear of unit.

Symbols

	AC (alternating current or voltage)	pF, nF, uF	picofarad, nanofarad, microfarad (capacitance)
	DC (direct current or voltage)	Hz kHz	hertz, kilohertz (frequency)
	Continuity	%	% duty cycle
	Diode test	°F, °C	Degrees Fahrenheit, Centigrade (temperature)
mV, V	millivolt, volt (voltage)		
Ω , k Ω , M Ω	ohm, kilohm, megohm (resistance)	AUTO	Autorange
		BAT	Low battery
uA, mA, A	microamp, milliamp, Amp (current)	HOLD	Display hold
		REL	Relative

Operating Instructions

AC or DC Voltage Measurements

1. Insert the black test lead banana plug into the negative **COM** jack and the red test lead banana plug into the positive **V** jack.
2. Turn the rotary switch to the **VAC** or **VDC** position.
3. Touch the test probes to the circuit under test and read the voltage on the display.

AC or DC Current Measurements

CAUTION: Do not make current measurements on the 10A scale for longer than 30 seconds followed by a 15 minute cool down period. Exceeding 30 seconds may cause damage to the meter and/or the test leads.

1. Insert the black test lead banana plug into the negative **COM** jack and the red test lead banana plug into the;
 - a. Positive **uA/mA** jack for currents to 400mA
 - b. Positive **10A** jack for currents to 10A
2. Turn the rotary switch to the **uA**, **mA** or **A** position.
3. Touch the test probes in series with the circuit under test and read the current on the display.

Resistance Measurements

1. Insert the black test lead banana plug into the negative **COM** jack and the red test lead banana plug into the positive **Ω** jack.
2. Turn the rotary switch to the **Ω** position.
3. Touch the test probes to the circuit or device under test and read the resistance on the display.

Capacitance Measurements

1. Insert the black test lead banana plug into the negative **COM** jack and the red test lead banana plug into the positive **CAP** jack.
2. Turn the rotary switch to the **CAP** position.
3. Touch the test probes to the circuit or device under test and read the capacitance on the display.

Frequency or Duty Cycle Measurements

1. Insert the black test lead banana plug into the negative **COM** jack and the red test lead banana plug into the positive **HZ** jack.
2. Turn the rotary switch to the **HZ/%** position.
3. Press the **HZ/%** key to select "**HZ**" or "**%**".
4. Touch the test probes to the circuit or under test and read the frequency or duty cycle on the display.

Temperature Measurements

WARNING: To avoid electric shock, disconnect test leads from any source of voltage before making a temperature measurement. Be sure that the thermocouple has been removed before changing to any other measurement function.

WARNING: To avoid electric shock, do not probe live circuits with the thermocouple probe..

1. Insert the type K thermocouple probe into the sub-miniature temperature socket. (see separate instruction sheet at the end of this manual)
2. Turn the rotary switch to the **°C** or **°F** position.
3. Read the temperature on the display.

Note: Although the meter specifies the temperature range to be -4 to 1400°F (-20 to 760°C) the supplied thermocouple's (Part No. TP870) temperature range is -40 to 482°F (-4- to 250°C).

Continuity Measurements

1. Insert the black test lead banana plug into the negative **COM** jack and the red test lead banana plug into the positive **Ω** jack. Observe polarity.
2. Turn the rotary switch to the **▶ •)))** position.
3. Press the **▶ •)))** key to select continuity.
4. Touch the test probes to the circuit or device under test. If the resistance is less than approximately 30Ω the buzzer will sound and the resistance appears on the display.

Diode Measurements

1. Insert the black test lead banana plug into the negative **COM** jack and the red test lead banana plug into the positive diode jack.
2. Turn the rotary switch to the **▶ •)))** position.
3. Press the **▶ •)))** key to select diode.
4. Touch the test probes to the diode under test. Forward voltage will indicate 0.4V to 0.7V. Reverse voltage will indicate "**OL**". Shorted devices will indicate near 0mV and an open device will indicate "**OL**" in both polarities.

Manual Ranging

The meter powers on in the autoranging mode. Press the **Range** key to go to manual ranging. Each press of the range key will step to the next range as indicated by the units and decimal point location. Press and hold the **Range** key for one second to return to autoranging.

Data Hold

Press the **Data Hold** key to freeze the reading in the display. "HOLD" will appear in the LCD. Press the key again to release the display.

Relative Measurements

The relative measurement feature allows you to make measurements relative to a stored reference value. A reference voltage, current, etc. can be stored and measurements made in comparison to that value. The displayed value is the difference between the reference value and the measured value.

1. Perform any measurement as described in the operating instructions.
2. Press the **Relative** button to store the reading in the display and the "REL" indicator will appear on the display.
3. The display will now indicate the difference between the stored value and the measured value.
4. Press the **Relative** button to return to normal operation.

Auto Off

The auto off feature will turn the meter off after 15 minutes of inactivity (Range switch or a key has not been turned or pressed). A beep will warn the user shortly before the auto off feature activates.

Maintenance

WARNING: To avoid electric shock, disconnect the test leads from any source of voltage before removing the battery/fuse cover.

WARNING: To avoid electric shock, do not operate your meter until the battery/fuse cover is in place and fastened securely.

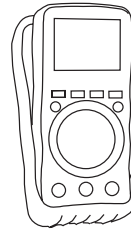
This Multimeter is designed to provide years of dependable service, if the following care instructions are performed.

1. Keep the meter dry.
2. Use and store the meter in mild ambient conditions. Temperature extremes can shorten the life of the electronic parts and distort or melt plastic parts.
3. Handle the meter gently. Dropping it can damage the electronic parts or the case.
4. Keep the meter clean. Wipe the case occasionally with a damp cloth. DO NOT use chemicals, cleaning solvents or detergents.
5. Use only fresh batteries of the recommended size and type. Remove old or weak batteries so they do not leak and damage the unit.
6. If the meter is to be stored for a long period of time, the batteries should be removed to prevent damage to the unit.

Battery Replacement

WARNING: To avoid electric shock, disconnect the test leads from any source of voltage before removing the battery/fuse cover.

1. Disconnect the test leads from the meter.
2. Remove the rubber holster (if in place).
3. Open the battery door by removing the screw using a Phillips head screwdriver.
4. Insert the new batteries into the battery holder, observing the correct polarity.
5. Replace the battery door and secure with the screw.



Fuse Replacement

WARNING: To avoid electric shock, disconnect the test leads from any source of voltage before removing battery/fuse cover.

1. Disconnect the test leads from any circuit being measured.
2. Remove the rubber holster (if in place).
3. Open the fuse cover by removing the screw on the rear cover using a Phillips screwdriver.
4. Remove the rear cover.
5. Remove the old fuse by gently pulling up on it.
6. Install the new fuse by gently pushing it into the holder.
7. Always use a fuse of the proper size and value (0.5A/250V fast blow, or 10A/250V fast blow).
8. Replace the fuse door and secure with the screw.

A UL mark does not indicate that this product has been evaluated for the accuracy of its readings.

Warranty

EXTECH INSTRUMENTS CORPORATION warrants this instrument to be free of defects in parts and workmanship for one year from date of shipment (a six month limited warranty applies on sensors and cables). If it should become necessary to return the instrument for service during or beyond the warranty period, contact the Customer Service Department at (781) 890-7440 ext. 210 for authorization or visit our website at www.extech.com (click on 'Contact Extech' and go to 'Service Department' to request an RA number). A Return Authorization (RA) number must be issued before any product is returned to Extech. The sender is responsible for shipping charges, freight, insurance and proper packaging to prevent damage in transit. This warranty does not apply to defects resulting from action of the user such as misuse, improper wiring, operation outside of specification, improper maintenance or repair, or unauthorized modification. Extech specifically disclaims any implied warranties or merchantability or fitness for a specific purpose and will not be liable for any direct, indirect, incidental or consequential damages. Extech's total liability is limited to repair or replacement of the product. The warranty set forth above is inclusive and no other warranty, whether written or oral, is expressed or implied.

Calibration and Repair Services

Extech offers complete repair and calibration services for all of the products we sell. For periodic calibration, NIST certification or repair of any Extech product, call customer service for details on services available. Extech recommends that calibration be performed on an annual basis to insure calibration integrity.



Support line (781) 890-7440

Technical support: Extension 200; E-mail: support@extech.com

Repair & Returns: Extension 210; E-mail: repair@extech.com

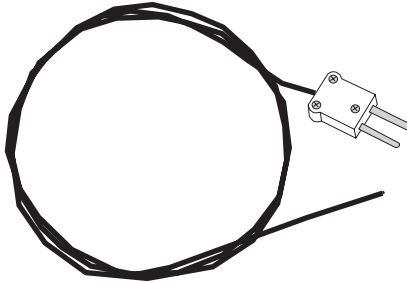
Product specifications subject to change without notice

For the latest version of this User's Guide, Software updates, and other up-to-the-minute product information, visit our website: www.extech.com
Extech Instruments Corporation, 285 Bear Hill Rd., Waltham, MA 02451

**Copyright © 2005 Extech Instruments Corporation.
All rights reserved including the right of reproduction
in whole or in part in any form.**

Model TP870

Type K Bead Wire Thermocouple Probe



WARNING: To avoid electric shock, do not probe into or near live electrical circuits with the thermocouple probe..

Sensor Type Type K thermocouple (Chromel – Alumnel)
Temperature range -40 to 482°F (-40 to 250°C)
Lead length 39" (1m)
Connector subminiature

Note: This probe is not UL listed