

EM921 MANUAL

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OPERATION MANUAL

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T-370 P.002/009 F-548

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WARNING

To avoid electric shock or injured, or damage the instrument, please read the manual carefully before operation.

1. SAFETY RULES

- 1-1. Check the case of the meter and test leads before operation.
- 1-2. When "E" signal appears, it means low battery and must be replaced.
- 1-3. Be sure whether the meter works well, if not, do not use and maintain it.
- 1-4. When measuring, must select correct function and range.
- 1-5. Do not apply voltage over specified.
- 1-6. Be careful when measuring voltage over 42 ACV or 60 DCV.
- 1-7. Your finger must be behind the barrier when measuring.
- 1-8. Before measuring resistance, continuity test or capacitance, the power must be turned off and all capacitors must be released.

- 1-9. Do not operate and store the meter in high temperature, wet or other dangerous place.
- 1-10. wipe the case with a damp cloth and detergent, do not use abrasives and solvents.

ELECTRIC SYMBOLS

- "E" low battery
- "A" warning
- "~" AC
- "DC" DC/AC
- "∞" continuity
- "GND" GND
- "DC" DC
- "diode" diode
- "insulation" dual insulation

2.FUNCTION FEATURES

- 4000 counting (9999 counting for frequency measurement), rate: 3 times/sec.
- Auto power-off: The instrument will be auto off after turning power-on for 15 minutes.
- Input resistance: 10M Ω
- Auto polarity transfer
- Over-range protection, "OL" signal appears

SPECIFICATION FOR FUNCTION KEY

RANGE	Range switch selection is based on auto range mode and appears "AUTO". Press it once, the range will be switched and it cycles from the lower range to higher.
RBL Δ	When measuring voltage, resistance and capacitance, the key is for relative measuring value. During measuring, when pressing it, the displaying value changes to reference value. When taking measurement again, the displaying value is the difference between measuring value and reference value, i.e. RBL Δ = MEASURING VALUE - REFERENCE VALUE. When measuring frequency, press it can switch to frequency and duty cycle induction.

OPERATION

Please note the voltage marked with " Δ ", the tested voltage can not be over it.

3-1. AC/DC VOLTAGE MEASUREMENT
Set the function switch to " \sim V" or " \sphericalcap V" position.

NOTE: do not measure the voltage over 600V.

3-2. RESISTANCE MEASUREMENT

NOTE: when testing the in-line resistance, please be sure that the circuit under tested is disconnected with the power and the capacitor is released completely. Set the function switch to " Ω " range. When measuring small resistance at 400 Ω range, the wire of the test leads will result in measuring error. To get more accurate reading, please short the test leads, press RHL key, the display will be "0", then, you can take measurement, and the displaying value is the measured resistance value.

3-3. DIODE MEASUREMENT

NOTE: to avoid damage the instrument, please be sure that the circuit is disconnected with the power and the capacitor is released completely. Set the function switch to "←" range. When the test leads connect the diode under measured, the forward voltage for silicon diode should be 0.5V~0.8V and the forward voltage for germanium diode should be 0.15V~0.3V, the backward measurement will display "OL"

3-4. CONTINUITY TEST

The measuring method is the same as that of diode but set the function switch to "→" range. When the circuit is shorted (resistance is less than 50Ω), buzzer sounds, and the circuit is open, "OL" will appear and buzzer will not sound.

3-5. CAPACITANCE MEASUREMENT

NOTE: when measuring in line capacitance, please turn the power off and release completely.
Set the function switch to "←" range. If measuring a single capacitor, it

should be released first; if measuring capacitor with polarity, the red test lead should connect the positive of the capacitor and the black lead should connect negative.

NOTE: it takes a long time to read when measuring large capacitor due to the measuring method. In order to reduce the distributed capacitance exists in the test leads and input terminal, please press "RBL" key before measuring and make the displaying value is "0". Thus, when taking measurement, the displaying value is the capacitance value.

3-6. FREQUENCY AND DUTY-CYCLE MEASUREMENT

NOTE: the input voltage must be less than 250V rms. Set the function switch to "Hz" range. Press "RBL" key to select frequency or duty-cycle measuring function

3. TECHNICAL DATA

TEMP: 23°C ± 5°C, humidity: ≤75% RH within one year

Accuracy = \pm (a% x reading + n)
 Here, "a" refers to relative item index of measuring error
 Here, "n" refers to absolute error items by number

DCV (— V)		RESOLUTION
RANGE	ACCURACY	
400.0mV	\pm (0.8% x reading + 5)	0.1mV
4.000V		1mV
40.00V		10mV
400.0V	\pm (1.0% x reading + 8)	0.1V
600V		1V

Input resistance: 400mV range > 10M Ω , other range: 10M Ω
 Overload protection: 400V range is 250V rms < 10 sec.
 Other range is DC 600V/AC 600V < 10sec.

ACV (— V)		RESOLUTION
RANGE	ACCURACY	
400.0mV	\pm (1.5% x reading + 8)	0.1mV
4.000V		1mV
40.00V	\pm (1.2% x reading + 5)	10mV
400.0V		0.1V
600V	\pm (1.5% x reading + 5)	1V

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 Input resistance: 10M Ω
 Overload protection: 400mV; 250V RMS < 10sec.
 Other range: DC 600V/AC 600V < 10sec.
 Frequency response: 50Hz-400Hz

RANGE	ACCURACY	RESOLUTION
400.0 Ω		0.1 Ω
4.000k Ω		1 Ω
40.00k Ω	$\pm (1.0\% \times \text{reading} + 5)$	10 Ω
400.0k Ω		100 Ω
4.000M Ω		1k Ω
40.00M Ω	$\pm (2.5\% \times \text{reading} + 5)$	10k Ω

Max. open voltage: approx. 0.5V
 Overload protection: 250 RMS

DIODE TEST (→)

RANGE	DESCRIPTION	TESTING CONDITION
→	It is the approximation of forward voltage drop when the diode is forward connection; when backward connection, "OL" displays.	Test current: 1.0 \pm 0.7mA, test voltage: approx. 1.5V

Overload protection: 250V RMS

CONTINUITY TEST(Ω)

RANGE	DESCRIPTION	TESTING CONDITION
Ω))	Buzzer sounds when the circuit under tested is short-circuit or resistance is less than 50 Ω.	Testing voltage is approx. 0.5V

Overload protection: 250V RMS

CAPACITANCE(+-)

RANGE	ACCURACY	RESOLUTION
4.000nF	±(5% x reading +40)	1pF
40.00nF	±(2.5% x reading +10)	10pF
400.0nF		100pF
4.000uF		1nF
40.00uF	±(3.5% x reading +15)	10nF
200.0uF	No specific, the value is only for reference	100nF

Overload protection: 250V RMS

FREQUENCY AND DUTY-CYCLE (Hz/DUTY)

RANGE	ACCURACY	SENSITIVITY
99.99Hz	(0.08% x reading +2)	1V
999.9Hz		10V
9.999KHz		X
99.99KHz		X
999.9KHz		X
9.999MHz		X
20.00MHz		X
DUTY-CYCLE		1V

Overload protection: 250V RMS

4. OTHER DATA

- The max. voltage between any terminals and GND is 600V
- Operation temp. and humidity: 0°C-40°C, humidity ≤75%RH
- Storage temp. and humidity: -20°C-60°C, humidity <80%RH
- Battery: 1.5V (AAA) x2
- Weight: approx. 126g(including batteries)

5. MAINTENANCE

- Periodically wipe the case with a damp cloth and detergent, do not use abrasives and solvents.
- Set the knob to "OFF" position if do not operate it. Take out of the batteries if do not use for a long time.
- Keep the meter away from wet, high temperature and magnet field.
- If the meter needs to be maintained, please contact us.

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