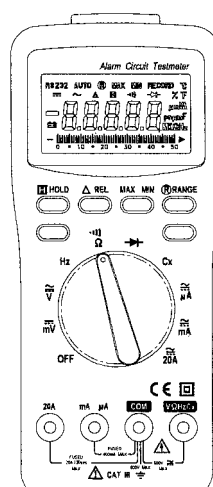
ACT METERS LTD

Alarm Circuit Test

ACT 5000

ALARM CIRCUIT TESTMETER

INSTRUCTION MANUAL



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1. SAFETY INFORMATION

- Read the following safety information carefully before attempting to operate or service the meter.
- To avoid damages to the instrument do not apply the signals which exceed the maximum limits shown in the technical specifications tables.
- Never measure current while the test leads are inserted into the input jacks.
- Do not use the meter or test leads if they look damaged. Use extreme caution when working around bare conductors or bus bars.
- Accidental contact with the conductor could result in electric shock.
- Use the meter only as specified in this manual ; otherwise, the protection provided by the meter may be impaired.
- Read the operating instructions before use and follow all safety information.
- Caution when working with voltages above 60V DC or 30 V AC RMS. Such voltages pose a shock hazard.
- Before taking resistance measurements or testing acoustic continuity, disconnect circuit from main power supply and all loads from circuit.

Safety symbols:

Caution refer to this manual before using the meter.

Dangerous voltages.

Meter is protected throughout by double insulation or reinforced insulation.
When servicing, use only specified replacement parts.

Comply with EN-61010-1

2. FEATURES

- 5 Digital LCD with Bar-graph
- Auto- Ranging on Volt, Ohm , Current, and Frequency, measurement
- Also provides MAX / MIN recording; data HOLD mode
- Ohms, Diode, Audible Continuity input Overload protection to 660Vrms
- 20A / 600V high energy fuse protection on 20A AC/DC
- Flip - up stand

3. SPECIFICATIONS

3-1 General Information

Environment conditions :

① Installation Categories III

② Pollution Degree 2

③ Altitude up to 2000 meters

④ Indoor use only

⑤ Relatively humidity 80% max.

⑥ Operation Ambient 0～40℃

maintenance & Clearing:

① Repairs or servicing not covered in this manual should only be performed by qualified personal.

② Periodically wipe the case with a dry cloth and detergent.

Do not use abrasives or solvents on this instruments.

Operating Principle : Dual slope integration

Numerical Display : 5 digit liquid crystal display (LCD) maximum reading 49999 and Bargraph indication.

Display Symbol Definition :

●	Decimal point
AC	Alternating current or voltage
DC	Direct current or voltage
V	Voltage
mV	Millivolt (1×10^{-3} volt)
μV	Microvolt
A	Ampere
mA	Milliampere (1×10^{-3} amp)
μA	Microampera
Ω	Ohm. Resistance
KΩ	Kilohm (1×10^{3} ohm) Resistance
MΩ	Megohm (1×10^{6} ohm) Resistance
kHz	Kilohertz(1×10^{3}cycles/sec) Frequency
Hz	Hertz (1 cycle / sec) Frequency
⊣▸⊢	Diode
·ı))	Continuity Beeper
[+ -]	Low Battery
▬	Negative polarity
Auto	Autorange
Ⓡ	Manual Range
△REL	Relative Reading
[H]	Date Hold
MIN	Minimum Reading
MAX	Maximum Reading

Range Selection	: All ranges are selected by single Range Switch operation.
Over Range Indication	: LCD will show a "OL".
Low Battery Indication	: The [+-] is displayed when the battery voltage drops below the proper operating voltage.
Sampling Rate	: 20 times/sec of Analog Bar-graph indication, 4 times /sec of digital display.
Power Source	: 1pcs 006p 9V 6F22 Battery.
Auto Power Off	: 30 minute approx. (LCD display " SLEEP ")
Battery Life	: 200hrs approx.
Polarity	: Automatic polarit " — " indicates negative input.
Operating Temperature and Humidity	: 0℃ to 40℃ (32℉ to 104℉) below 80% RH
Storage Temperature and Humidity	: -10℃ to 60℃ (14℉ to 140℉) below 70% RH
Dimensions	: 205 (L) × 90 (W) × 46(H) mm
Weight	: Approx. 420g
Accessories	: Test leads, Battery and Instruction manual.

3-2 Electrical Specifications

Accuracies are ± (...%of reading + ...digits) at 23℃ ± 5℃, below 80%RH

⇨DC Voltage :

(Autoranging & Manual range) (500mV Manual range)

Range	Resolution	Accuracy	Input Impedance	Overload Protection
500mV	10μV	±0.09%+5d	≒10MΩ	660Vrms
5V	0.1mV			
50V	10mV			
500V	100mV			
600V	100mV			

⇨AC Voltage : (Autorange & Manual range)

Range	Resolution	Accuracy	Input Impedance	Overload Protection
5V	0.1mV	±0.9%+20d	≒10MΩ	660Vrms
50V	1mV			
500V	10mV			
600V	100mV			

⇨Audible Continuity:

Range	Resolution	Open Circuit Voltage	Continuity Beeper	Overload Protection
•)))	0.01Ω	≒3V	≤ Approx. 500Ω	660Vrms

⇨**DC Current : (Manual range & Autorange)**

Range	Resolution	Accuracy	Overload Protection
5000 μA	0.1 μA	±0.9%+20d	0.5A / 600V high energy fuse
500mA	0.01mA		
5A	0.1mA		20A / 600V high energy fuse
20A	1mA		

⇨**AC Current : (Autorange & Manual range)**

Range	Resolution	Accuracy	Overload Protection
5000 μA	0.1 μA	±2%+20d	0.5A / 600V high energy fuse
500mA	0.01mA		
5A	0.1mA		20A / 600V high energy fuse
20A	1mA		

⇨**Diode Test: (⊣▶⊢)**

Range	Resolution	Short Circuit Current	Open Circuit Voltage	Overload Protection
⊣▶⊢	0.1mV	0.8mA typical	3V	660Vrms

⇨Resistance (Ω) : (Autoranging & Manual range)

Range	Resolution	Accuracy	Open Circuit Voltage	Overhead protection
500Ω	0.01Ω	±0.3%+10d	3V	660Vrms
5KΩ	0.1Ω			
50KΩ	1Ω			
500KΩ	10Ω			
5MΩ	100Ω	±0.9%+20d		
50MΩ	1KΩ	±2%+20d		

⇨Frequency (Hz): (Autoranging)

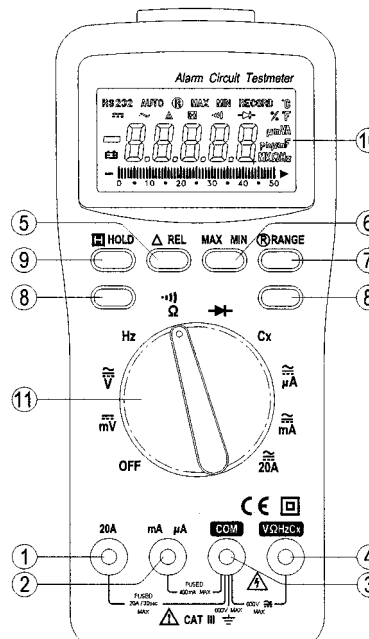
Range	Resolution	Accuracy	Sensitivity	Overhead protection
50HZ	1mHZ	±0%+40d	200mV	660Vrms
500HZ	0.01HZ			
5KHZ	0.1HZ			
50KHZ	1HZ			
500KHZ	10HZ		400mV	
10MHZ	100HZ		1V	

⇨Capacitance (F)

Range	Resolution	Accuracy	Overhead protection
500nF	100pF	±0.9%+20d	0.5A/600V
5μF	1nF		
50μF	10nF	±2%+20d	
500μF	100nF		

4. PARTS & CONTROLS

4-1 Name of Parts and Positions:



(Fig-1)

1. 20A Measuring Connector :
   To connect positive lead (red test lead) for current measurement below 20A.

2. mA Measuring Connector :
   To connect positive lead (red test lead) for current measurement bellow 500mA.

3. COM Measuring Connector :
   To connect negative lead (black test lead) for voltage, current, resistance, frequency, Diode, continuity, capacitor measurement.

4. VΩHz Measuring Connector :
   To connect positive lead (red test lead) for voltage, resistance, frequency, diode, continuity, measurement.

5. Relative Reading Button :
   Press △REL button to enter the Relative reading mode. Zero the display , and store the displayed reading as a reference value. Press and hold down △REL button for 2 seconds to exit the Relative mode.

6. Auto-Range & Manual-Range Button :
   Press RANGE to select the Manual Range mode and turn off the AUTO annunciator. (The meter remains in the range it was in when manual range is 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.

   If you are already in the highest range, the meter " wraps around " to the lowest range. (In the Frequency counter mode, pressing RANGE manually selects the sensitivity range.) To exit the Manual Range mode and return to Auto Range mode. Press and hold down RANGE for 2 seconds, the AUTO annunciator turns back on.

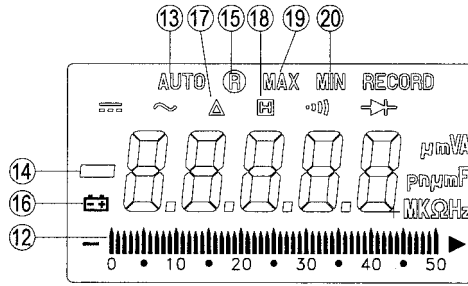
7. Minimum & Maximum Recording Button:
   Press MIN/MAX to enter the MIN, MAX Recording mode (manual range only). Select the proper range before selecting MIN MAX to ensure that the min/max reading will not exceed the testing range. Press once to select MIN. Press again to select MAX. and press again to release MIN/MAX recording function.

8. AC/DC Current Select :
   a) To select function DC or AC current.
   b) To select function Ω or •))) current.

9. Data Hold (H) Button :
   Press it once to hold the measured value in dark place when reading or recording is difficult, press it again to release the holding status.

10. LCD Display :
    Measured values, unit, symbols, and decimal points are displayed.

11. Range Selector Switch :
    For power on and power off and selection of desired range.



(Fig-2)

12. Analog Display Scale.
13. Auto-range Mode :
    Meter is in the autorange mode and will automatically select the range with the best resolution. Meter powers-on in autorange mode.
14. Negative Polarity :
    Automatically indicating negative inputs
15. Manual-range Mode indicator.
16. Low Battery :
    As battery power is not sufficient. LCD will display [+ -] .
17. Relative Mode indicator.
18. Data Hold indicator.
19. Maximum Value in MIN MAX Recording Mode :
    The value displayed is the maximum reading taken since the MIN MAX Recording mode was entered.
20. Minimum Value in MIN MAX Recording Mode :
    The value displayed is the minimum reading taken since the MIN MAX Recording mode was entered.

4-2 Precautions and preparations for measurement

(1) DO NOT attempt to take any voltage or current measurement that may exceed the maximum rating of this instrument.

(2) Be sure that battery is correctly placed in the case and connected to the battery snap.

(3) Make sure the range selected is greater than test current or voltage prior to attempting a measurement. Also, always changing range after breaks contact with the test circuit for at least one of the test leads.

(4) Check the input terminal position for red test lead for different test ranges.

(5) DO NOT measure anything before the rear cover of multimeter is secured.

(6) When finished the measurement. Switch OFF the power.

(7) Be sure remove the battery when it will not be used for a long time to avoid any battery fluid leakage problem.

(8) DO NOT use or store the instrument in a high temperature or high humidity environment.

(9) DO NOT check resistance in a circuit while power is on either circuit capacitors which are not discharged

4-3 DC/AC Voltage Measurements

WARNING

Maximum Input Voltage at DC VOLT Range is 1000VDC. Do not attempt to take any voltage measurement that may exceed 1000VDC to avoid electrical shock hazard and damage to this instrument.

(1) Connect red test lead to " VΩ" terminal and black test lead to " COM " terminal.

(2) Set Range Switch to V range and press " orange " button to AC/DC function.

(3) Connect the test leads IN PARALLEL to the circuit being measured.

(4) Read the Voltage value on LCD.

4-4 DC/AC Current Measurement

(1) Connect red test lead to "mA" Terminal for Current measurements lower than 400mA. (For measuring Current between 400mA to 20A, Connect red test lead to "20A" terminal.) Connect black test lead to "COM" terminal.

(2) Set Range Switch to desired A range, and press " orange " button to DC/AC function.

(3) Cut off the power to the test circuit and connect the instrument IN SERIES with the test circuit , with the black test lead on the negative ⊖ side and the red lead on the positive ⊕ side being measured.

(4) Apply power and read the current value on LCD.

4-5 Diode Tests

> **WARNING**
>
> Before taking any in-circuit measurement, remove power from the circuit being tested and discharge all capacitors in the circuit.

(1) Connect red test lead to the " VΩ " terminal and black test lead to the " COM" terminal.

(2) Set range switch to the diode test position " ⊳| ".

(3) Connect the red test lead to the anode side and black test lead to the cathode side of the diode being tested.

(4) Read forward voltage (Vf) Value on LCD.

(5) If the polarity of test leads are reversed with diode polarity, the digital reading should nearly equal to the reading in the open circuit condition. This can be used for distinguishing anode and cathode poles of a diode.

4-6 Resistance Measurement

> **WARNING**
>
> Before taking any in-circuit resistance measurement, remove power from the test circuit and discharge all Capacitors.

(1) Connect red test lead to "VΩ" terminal and black test lead to "COM" terminal.

(2) Set Range Switch to Ω range.

(3) Connect Test Lead to the Circuit being measured and read the resistance Value on LCD.

4-7 Frequency Measurement

(1) Set Range Switch to Hz range.

(2) Connect red test lead to " V/Ω/Hz " terminal and black test lead to " COM" terminal.

(3) Connect Test prods of test leads to the circuit being measured.

(4) Read the frequency value (Hz) on LCD.

5. BATTERY & FUSE REPLACEMENT

WARNING

To prevent electrical hazard or shock, turn off multi-meter and disconnect test leads before removing back cover.

5-1 Battery Check-Up & Replacement

(1) As battery power is not sufficient, LCD will display " [+ -] ". Replacement of Two new batteries type 006P 9V is required.

(2) Set Range Switch to "OFF" position. Use a screw drive to remove the rear cover. Take out the battery and replace them with one new batteries of type s-006p 9V 6F22.

(3) Place back the rear cover and secure it with the original screw.

5-2 Fuse Replacement

(1) Set Range Switch to "OFF" position. Use a screw drive to remove rear cover. Take out the malfunction fuse and replace it with a new fuse rate 0.5A/600V (or 20A/600V) of fast blow type.

(2) Place back the rear cover and secure it with the original screw.

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