CP7400 and CP7401 Multimeter User Manual 2. Resistance Measurement (see Figure 2a)

I. Inspection

Open the clamshell and take out the multimeter. Check whether any items are missing or damaged and contact your supplier immediately if they are

1 pair

User Manual _ 1 pc Test Leads Multimeter in Protective Holster 1 pc

II. Safety Precautions

AWarning: Read carefully before using the Multimeter.

- Do not use the multimeter if the device or test leads appear damaged or if you suspect that the device is not operating properly. Pay particular attention to the test lead insulation.
- If the test leads are damaged, they must be replaced with leads of the same type or the same electrical specifications. 2.
- When measuring, do not touch exposed wires, connectors, unused inputs, or other exposed parts of the circuit being measured.
- When measuring the voltage higher than 60 VDC or 36 VACrms, keep 4. your fingers behind the finger guards on the test leads in order to prevent electric shock.
- Never try to measure voltage or current that exceeds the maximum value 5. listed on the multimeter. Before switching functions or ranges, make sure to disconnect the test leads 6.
- from the circuit to be tested. To avoid false readings, replace the batteries when the low-battery
- indicator 🖙 appears

III. Electrical Symbols

Iow battery	High voltage warning
≟ Electrical ground	₩ AC/DC
Double insulation	⚠ Warning

IV. General Specifications

- The maximum voltage between the input jack and ground: 250Vrms 1.
- Max display 1999, over range display "OL", update rate: 2-3 times/second 2.
- Range select: Auto range CP7401; Manual range CP7400 3.
- Backlight: manual on, auto shut off after 30 seconds 4.
- "APO" displayed on screen to indicate that Auto Power Off mode is active 5.
- Polarity: "-" symbol displayed on screen to indicate negative polarity signal 6. Data hold function: III symbol displayed on screen when data hold function 7.
- 8. Low battery power: 🖙 symbol displayed on screen when the power from the batteries is low
- 9. Battery: (2) AAA, 1.5V
- 10. 10A jack: Fuse, 10A 250V, fast-acting ceramic fuse, Φ 5×20mm
- 11. mA/μA jack: Fuse, 200mA, 250V, fast-acting ceramic fuse, Φ5×20mm
- 12. Operating temperature: 0-40°C (32°F-104°F) Storage temperature: -10-50°C (14°F-122°F)
 - Relative humidity: 0°C−30°C: ≤75% RH, 30°C−40°C: ≤50% RH
- Operating altitude: 0-2000m
- 13. Dimensions: 134 × 77 × 47 mm
- 14. Weight: about 200 g (batteries included) 15. Electromagnetic compatibility:
- In fields with less than 1 V/m radio frequency, the total accuracy = designated accuracy + 5% of measurement range In fields with more than 1 V/m radio frequency, the accuracy is not specified.

V. Multimeter Parts (Figure 1)

1 Display screen

- 2 Function buttons
- 3 Function Selector Switch 4 10A input jack
- 5 COM jack 6 VΩmA jack (other functions

present depending on model)

1 -2 (2) 3 (5)

> 0 0

Figure 1

-(6)

VI. Button Functions

- 1. CP7401:
- SEL/REL: press this button to switch between AC and DC modes for mV ↔ $\mu A \cong, m A \cong, A \cong$; press to activate the relative measurement mode when measuring capacitance. HOLD/&: Press to enter or exit data hold mode. Hold the button longer than

(4)

- 2 seconds to turn the backlight on/off.
- 2. CP7400
 - HOLD/SEL: Press to enter or exit the data hold mode
 - In continuity/diode mode, press to switch between the two modes 埣: Press to turn on/off backlight.

VII. Basic Functions

To avoid incorrect readings, replace the batteries if the battery low power symbol \blacksquare appears. Pay special attention to the warning sign \triangle beside the test lead jacks. The tested voltage or current must not exceed the values listed on the ter front housing.

AC/DC Voltage Measurement (see Figure 2a)

1) Turn the selector switch to one of the "V~" or "V-" positions 2) Insert the black test lead into the COM jack, and the red test lead into the $V\Omega$ mA" jack. Connect test leads in parallel with the load.

▲Notes:

 Do not measure voltage over 250Vrms. This may expose the user to electric shock and damage the multimeter. On CP7400 only, if the range of the voltage to be measured is unknown, select the maximum range to start and then reduce the range accordingly. Pay extra attention when measuring



Figure 2a

- high voltage in order to avoid electric shock. Before using the multimeter, it is
- suggested to measure a known voltage for verification

- 1) Turn the selector switch to "Ω" position
- 2) Insert the black test lead into the COM jack, the red test lead into the
- "V Ω mA" jack. Connect test leads in parallel with the component or circuit to be measured. ANotes: Before measuring resistance, turn off the circuit power, and fully discharge
 - all capacitors. If possible disconnect one end of the component from the rest of the circuit. If the resistance of the component or circuit is greater than the range, the
 - "OL" symbol will be displayed on the screen. When measuring low resistance, the test leads will produce $0.1\Omega - 0.2\Omega$
 - measurement error. To obtain an accurate measurement, subtract the value displayed when the two test leads are shorted from the measured value PLEASE NOTE that the relative measurement mode (REL) cannot be used when measuring resistance. Use REL ONLY when measuring capacitance.
 - When measuring high resistance above $1M\Omega$, it may take a few seconds to steady the readings

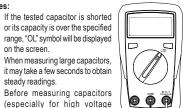
Continuity Measurement (see Figure 2a) 1) Turn the selector switch to "••••" position. 3.

- 2) Insert the black test lead into the COM jack, the red test lead into the
- "V Ω mA" jack. Connect test leads in parallel with the circuit to be tested. 3) Measured circuit's resistance >51Ω, the circuit is open
- 4) Measured circuit's resistance $\leq 10\Omega$, the circuit is complete, and the continuity test buzzer will sound
- 4. Diode Test (see Figure 2b) Turn the selector switch to "₩" position.
- 1) 2) Insert the black test lead into the COM jack, the red test lead into the "V Ω mA" jack. Connect test leads in parallel with the diode as follows: red lead to anode, black lead to cathode (direct polarity); then red lead to cathode,
- black lead to anode (reverse polarity). 3) "OL" symbol appears when the diode is open or polarity is reversed. Direct polarity reading for a good silicon diodes is 500 to 800mV (0.5 to 0.8V).
- ANotes: Before testing diodes, turn off the circuit power, and fully discharge all capacitors

Disconnect one end of the diode from the rest of the circuit if possible

5. Capacitance Measurement (CP7401 only, see Figure 2b) ▲Notes:

capacitors), fully discharge them



- Figure 2b 1) Turn the selector switch to capacitance test.
- 2) Insert the black test lead into the COM jack, the red test lead into the "V Ω mA" jack. Connect the test leads in parallel with the capacitor
- 3) When there is no input, the multimeter displays a fixed value (internal capacitance of multimeter). To ensure accuracy when measuring small capacitors, the internal capacitance must be subtracted from the measured value. Disconnect the test leads from the capacitor, press the (REL) buttor to subtract the internal capacitance, and reconnect the test leads in paralle across the capacitor.

DC Current Measurement (see Figure 3)

- ANotes · Before measuring DC current, turn off the circuit power and carefully check the input jack and selector switch position.
- If the range of the measured current is unknown, start with the "A" position of the switch, and if needed, step down to the "mA" or "µA" switch position. Remember to insert the red test lead into the appropriate test jack.
- If a fuse is blown during testing, replace the fuse with the same type. 10A jack: Fuse 10A, 250V, fast-acting ceramic fuse, Φ5×20mm
- $V\Omega mA$ jack: Fuse 200mA, 250V, fast-acting ceramic fuse, $\Phi5{\times}20mm$ Multimeter must be connected in series with the circuit. Do not connect the test leads in parallel with any circuit, to avoid the risk of personal injury
- and damage to the multimeter. If measuring current on the 10A scale, each measurement time should be less than 10 seconds and the next test should not be made until after
- a 15 minute wait. 1) Turn the selector switch to A, mA, or

õð

Figure 3

µA position 2)

Insert the black test lead into the COM jack. To measure amperes, insert the red test lead into the "10A" jack To measure milliamps or microamps insert the red test lead into the "VΩmA" jack. Connect test leads in series with the circuit under test. õ

7. AC Current Measurement (CP7401 only) A Notes

- Before measuring AC current, turn off the circuit power and carefully check the input jack and selector switch position.
 - If the range of the measured current is unknown, start with the "A" position of the switch, and if needed, step down to the "mA" or " μ A" switch position. Remember to insert the red test lead into the appropriate test jack.
 - If a fuse is blown during testing, replace the fuse with the same type. 10A jack: Fuse 10A, 250V, fast-acting ceramic fuse, Φ5×20m
- VΩmA jack: Fuse 200mA, 250V, fast-acting ceramic fuse, Φ5×20mm Multimeter must be connected in series with the circuit. Do not connect the test leads in parallel with any circuit, otherwise there is a risk of personal
- injury and damage to the multimeter. If measuring current on the 10A scale, each measurement time should be less than 10 seconds and the next test should not be made until after
- a 15 minute wait. 1) Turn the selector switch to "A", "mA", or "uA" position.
- 2) Insert the black test lead into the COM jack. To measure amperes, insert the red test lead into the "10A" jack. To measure milliamps or microamps insert the red test lead into the "VQmA" jack. Connect test leads in series with the circuit under test.

- 8. Small Battery Measurement (CP7400 only, see Figure 4) Turn the selector switch to "1.5V", "9V", or "12V" position to match the type of battery being tested.
- 2) Insert the black test lead into the COM jack, the red test lead into the 'VΩmA" iack. Connect the red test lead to the positive battery terminal "+", black test lead to the negative battery terminal "-"
- 3) Battery voltage under load and the battery's condition will be shown on the screen.

1.5\ 30Ω ≥ 1.31V

0.95V - 1.31V

≤0.94V

When the measured voltage is less than 0.2V (0.05V-0.19V), no indicator

The multimeter is ready for use 2 seconds after it is turned on.

15 minutes. Press any button to wake it up.

the input current is higher than 10A (AC/DC).

Model

CP7400

CP7401

Model

CP7401

CP7401

CP7401

CP7400/CP7401

Model

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CP7400/CP7401

CP7400/CP7401

CP7401

Resolution

0.1Ω

0.001V

Overload protection: 250Vrms (AC/DC)

Resolution

0.001nF 0.01nF

0.001uF

0.01ul

0.001mF

0.1uF

Overload protection: 250Vrms (AC/DC): To test capacitance ≤200nF

0.1nF

CP7400/CP7401

Overload protection: 250Vrms (AC/DC)

CP7401, and turn on the multimeter

status will be displayed and the reading will flash for 3 seconds in every

The multimeter automatically shuts down if there is no operation for

To disable auto shutdown, turn the selector switch to OFF position, press and hold the "HOLD/SEL" button on CP7400 or "SEL/REL" button on

When pressing any button or turning the selector switch, the buzzer

Input voltage ≥250V (AC /DC), the buzzer will continuously beep indicating the input voltage is at least 250V (AC/DC) or higher.

2) Input current > 10A (AC/DC), the buzzer will continuously beep indicating

5) When testing continuity the buzzer will beep continuously when the resistance is ${\leq}\,10\Omega.$

Combined voltage of two internal AAA batteries <2.5V. was whole

appears and flashes for 3 seconds every 6 second period. During low power status, the multimeter can still work.

Combined voltage of two internal AAA batteries <2.2V, a solid T symbol appears, the multimeter will not work.

Accuracy: ±(% of reading + numerical value of the least significant digit) listed at 23°C±5°C(73.4°F±9°F), relative humidity: ≤75%.

Input impedance: 10MΩ; Overload protection: 250Vrms (AC/DC)
Reading might be unstable at mV range when no load is connected. The value becomes stable once the load is connected.
Max input voltage: ±250V. When the voltage ≥250V, "OL" symbol appears.

Input impedance: $10M\Omega$ Frequency response: 40Hz - 400Hz, sine wave RMS (average response). Max input voltage: $\pm 250V$, when the voltage $\geq 250V$, "OL" symbol appears.

Resolution

0.1mV 1mV

0.01V

0.1V 1V

Resolution

0.1mV

0.001V

0.01V

Resolution

0.1Ω 1Ω

0.01kΩ

0.1MΩ

Resistance ≥50Ω, no beep

Remark

ilicon diode voltage drop: 0.5 ~ 0.8V.

Accuracy Using REL mode ±(5%+5) ±(4%+8)

 $\pm(4\%+8)$

±(4%+8

±(4%+8

±(4%+8)

± (10%)

Resistance $\leq 10\Omega$, continuous beep.

Open circuit voltage: 2.1V , test

Measurement result = reading of resistance – reading with shorted test leads
Overload protection: 250Vrms (AC/DC)

current: 1mA

0.1kO

0.1V

3) 1 min before auto shutdown, the buzzer will emit 5 continuous beeps

4) Immediately before shutdown, the buzzer will emit 1 long beep.

"Good": Tested battery is good

"Low": Low power but still usable

"Bad": Replace battery

Small Battery Type Load Resistance "Good" Voltage Range

"Bad" Voltage Range

6 second interval

Additional Features

will beep once.

Buzzer Operation

Low power warnings

VIII. Specifications

DC voltage

Range 200.0mV 2000mV

20.00V

200.0V 250V

AC voltage

Range

2.000V

20.00V

200.0V

250V

Resistance

Range 200.0Ω 2000Ω

20.00kΩ

200.0kΩ

20.00MΩ

200.0MΩ

Range

-

Range 2.000nF 20.00nF

200.0nl

2.000μF 2.000μF

200.0ul

2.000ml

use REL mode

Continuity, Diode Test

Capacitance (CP7401 only)

200.0m

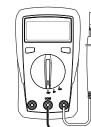
Range

"Low" Voltage

△Notes:

1)

9.



900Ω

≥ 7.8\

5.7V – 7.7V

≤ 5.6V

Figure 4

et--E⊒

12\

≥ 10.5\

7.6V - 10.4V

≤ 7.5V

Accuracy ±(0.7%+3) ±(0.5%+2)

±(0.7%+3)

±(0.7%+3) ±(0.7%+3)

Accuracy

±(1.0%+2)

±(0.7%+3)

 $\pm(1.0\%+2)$

±(1.2%+3)

±(1.2%+3)

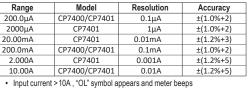
Accuracy ±(1.0%+2) ±(0.8%+2)

±(0.8%+2)

±(0.8%+2

±(1.2%+3)

±(5.0%+10)



Resolution 0.1μA 1μA

0.01mA

0.1mA

0.001A

0.01A

Accuracy ±(1.2%+3) ±(1.2%+3)

 $\pm(1.2\%+3)$

±(1.2%+3)

±(1.5%+5)

±(1.5%+5)

Input current > 10A, "OL" symbol appears and meter beeps
Overload protection: 250/rms
μA, mA range: F1 Fuse 200mA, 250V, fast-acting ceramic fuse, Φ5×20mm
10A range: F2 Fuse 10A, 250V, fast-acting ceramic fuse, Φ5×20mm

Mode

CP7401

Frequency response: 40-400 Hz.; Overload protection: 250Vrr

Frequency response: 40–400 Hz," Overload protection: 250/rms
Accuracy guarantee range: 5–100% of the range, shorted circuit allows least significant digit 52
Input current > 10.10A , "OL" symbol appears and meter beeps
μA, mA range: F1 Fuse 200mA, 250V, fast-acting ceramic fuse, Φ5×20mm 10A range: F2 Fuse 10A, 250V, fast-acting ceramic fuse, Φ5×20mm

AWarning: Before opening the rear cover, turn function selector switch to

"OFF", disconnect the test leads from the circuit under test, then unplug the

1) Clean the case with a damp cloth and mild detergent. Do not use abrasive

2) If there is any malfunction, stop using the multimeter and return it for

To avoid false readings, replace the batteries when the low battery

Figure 5a

Ì

Figure 5b

Protec nolste

Screws

Fuses

Sci

3) Remove used exhausted batteries. A Note the correct battery polarity

F1 Fuse 200mA, 250V, fast-acting ceramic fuse, Φ5×20mm

Learn more about electrical testing our website.

F2 Fuse 10A, 250V, fast-acting ceramic fuse, Φ5×20mm

This product should be disposed of separately from household waste

shown inside the battery compartment. Install two fresh 1.5V AAA batteries

OC OF

Battery and Fuse Replacement (see Figure 5a, Figure 5b)

DC Current

AC Current (CP7401 only)

Range 200.0μA

2000µA

20.00mA

200.0mA

2.000A 10.00A

IX. Maintenance

test leads from the test jacks.

cleaners or solvent.

repair or replacement

indicator 🖙 appears.

"OFF "position and remove

the test leads from the circuit and then from the input jacks.

holster. Loosen the screw on

the battery cover at the top of the rear housing, remove

the battery cover to replace

1) Turn the selector switch to

"OFF "position and remove

the test leads from the circuit

and then from the input jacks.

Loosen both screws on the

rear housing, then remove

3) Remove the blown fuse and a

install a new fuse with exactly

the same specifications.

according to local laws and regulations

2) Take off the protective holster

the rear housing.

Disposal Information

the hatteries

Fuse replacement.

Fuse specification

2) Take off the protective

1) Turn the selector switch to holster

1. General Maintenance

Battery replacement:

2.