

MS 300 SERIES METER

USER'S MANUAL

Safety

Meaning of symbol

CAUTION! Please consult the operating instructions before using the device. In these operating instructions, failure to follow or carry out instructions preceded by this symbol may result in personal injury or damage to the device and the installations.

Meaning of symbol

This appliance is protected by double insulation or reinforced insulation. It does not have to be connected to an earth protection terminal for electrical safety.

Thank you for purchasing this MS306 multimeter.

To obtain the best service from your unit:



- **Read** these operating instructions carefully,

- **Comply** with the precautions for use.



PRECAUTIONS FOR USE

- Never use on a voltage network over 600V with respect to the earth connection. This voltage surge category III multimeter complies with stringent reliability and availability requirements, corresponding to fixed industrial and domestic installations (see IEC 664-1).
- Do not use on alternative and continuous voltages > 600V.
- Indoor use in environments with a maximum pollution level of 2 (EN 50419:2006) temperature of -10°C to +50°C and relative humidity below 90%.
- Respect the value and type of the fuses to avoid damaging the instrument and canceling the warranty.
- 1A fuse 600V
- 10A fuse 600V
- Use accessories corresponding to safety standards (EN 61010-1:2001) with 600V minimum voltage and surge category III.
- Before any measurement, ensure correct positioning of the leads on the multimeter and of the switch. When the value range of a measurement is not known, place the switch at the highest caliber, and then gradually reduce it until the appropriate caliber is achieved: the reading should preferably be in the upper 2/3 of the range.
- Never measure resistances on a live circuit.
- During current intensity measurements (without a clip-on ammeter), stop circuit power supply before connecting or disconnecting the multimeter or changing caliber.
- The leads must be disconnected to open the lower half of the meter case
- Never connect to the circuit to be measured if the casing is not properly closed.

CONTENTS

1-Description.....	2
2-Reference conditions.....	2
3-Specifications.....	3
4-General characteristics.....	5
5-Supply.....	5
6-Maintenance.....	5

1 DESCRIPTION

The MS306 multimeter is for everyday use by electricity professionals. It offers the following functions:

- Voltmeter: voltage measurement (V_{DC} and V_{AC})
- Ammeter: current intensity measurement (A_{DC} and A_{AC})
- Ohmmeter: resistance measurement (Ω) with manual calibration
- Audible: continuity test

1-1 Safety terminals, $\Phi 4\text{mm}$

- **COM** common, terminal receiving the black lead (1)
- **V Ω** for voltage and resistance (2)
- **A** for A_{DC} and A_{AC} calibers, **mV** for using a clamp (4)
- **10A** for 10A calibers (DC/AC) (3)

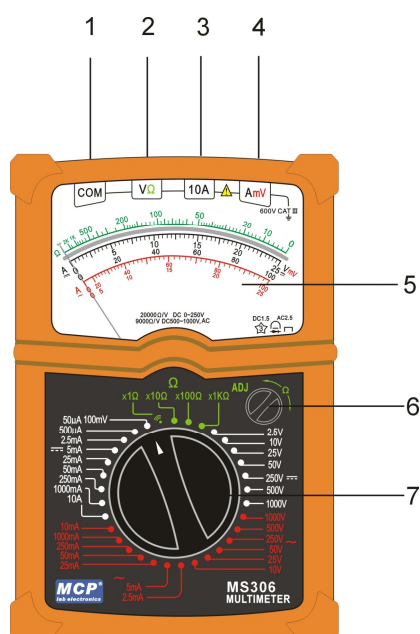
1-2 5-range dial (5)

- 2 black, with anti-parallaxe mirror, for the A_{DC} , V_{DC} and V_{AC}
- 1 green, with anti-parallaxe mirror, for the Ω
- 2 red for the A_{AC} measurements

1-3 Zero calibration button on the ohmmeter (6)

(Correction of battery wears status)

1-4 Function selection switch (7)



2 REFERENCE CONDITIONS

Temperature: 23°C±2°C

Humidity: 45%RH±5%

Position: horizontal±2°

Ensure that the pointer is at zero before starting any measurements.

Zero adjustment: open the device. Mechanical zero adjustment is carried out by turning the screw on the back of the null meter.

Ensure that the switch is correctly positioned.

When an estimated measurement is unknown, place the switch at the highest caliber, and then gradually reduce it until the appropriate caliber is achieved: the reading should preferably be in the upper 2/3 of the range.

3 SPECIFICATIONS

3-1 DC VOLTAGE

Connect the leads to the multimeter (be careful of switch position, see below) and connect to the circuit to be controlled. When an estimated measurement is unknown, place the switch at the highest caliber, and then gradually reduce it until the appropriate caliber is achieved.

To obtain voltage in V, multiply the appropriate range value by the reading coefficient indicated in the table.

VDC	100mV	2.5V	10V	25V	50V	250V	500V	1000V
Range(indication)	100	25	100	25	25	25	25	100
Reading coefficient	×1	×0.1	×0.1	×1	×2	×10	×20	×10
Internal resistance	2kΩ	50kΩ	200kΩ	500kΩ	1MΩ	5MΩ	4.5MΩ	9MΩ
Accuracy	1.5%							
Admissible overload	600V	240V	420V	600V	600V	600V	600V	1200V

3-2 AC VOLTAGE

VAC	10V	25V	50V	250V	500V	1000V
Range(indication)	100	25	25	25	25	100
Reading coefficient	×0.1	×1	×2	×10	×20	×10
Internal resistance	90kΩ	225kΩ	450kΩ	2.25MΩ	4.5MΩ	9MΩ
Accuracy	2.5%					
Bandwidth	45~1kHz					45~150Hz
Admissible overload	320V	470V	600V	600V	600V	1200V

The presence of a DC component falsifies the measurement.

3-3 DC CURRENT

Connect the leads to the multimeter and connect in series in the circuit with:

-the red lead in terminal "A", up to 1000mA,

-the red lead in the "10A" terminal for 10A DC and AC caliber

Cut power supply before switching.

To obtain intensity in μA, mA or A, multiply the value on the appropriate scale by the reading coefficient indicated in the table.

ADC	Scale (indication)	Reading coefficient	Voltage drop at inputs	Accuracy	Protection
50μA	25	×2	100mV	1.5%	1A/500V
500μA	25	×20	375mV		
2.5mA	25	×0.1	375mV		
5mA	25	×0.2	375mV		
25mA	25	×1	375mV		
50mA	25	×2	375mV		
250mA	25	×10	375mV		
1000mA	100	×10	375mV		
10A	100	×0.1	100mV		10A/500V



Do not use input A_{AC} on unprotected intensity transformers.

3-4 AC CURRENT

AAC	2.5mA	5mA	25mA	50mA	250mA	1000mA	10A
Scale(indication)	25	25	25	25	25	100	100
Reading coefficient	×0.1	×0.2	×1	×2	×10	×10	×0.1
Voltage drop at inputs	750mV	750mV	750mV	750mV	750mV	750mV	100mV
Accuracy	2.5%						
Protection	1A/500V						10A/500V

3-5 Ω RESISTANCE MEASUREMENT

Zero adjustment on the ohmmeter is carried out using the calibration button (front) by short-circuiting the inputs.

Ω	Ω×1	Ω×10	Ω×100	Ω×1k
Scale(indication)	2k...0			
Reading coefficient	×1	×10	×100	×1000
Internal resistance	75Ω	750Ω	7.5kΩ	75kΩ
End of scale current	60mA	6mA	600μA	60μA
Open circuit voltage	4.5V			
Accuracy	±10%			
Admissible	400V			

3-6 AUDIBLE CONTINUITY TEST-SEMI-CONDUCTOR TEST

NB: In Ω×1: “buzzer” threshold ≤50Ω, control of diode on or blocked (, anode in “COM” for on). Do not carry out live measurements.

4 GENERAL CHARACTERISTICS

4-1 Dimensions and weight

Dimensions: 165×105×50mm

Weight: 670g

4-2 Power supply

1.5V×3 battery (AA)

4-3 Maximum climatic conditions

Temperature use -10°C to +50°C; storage -30°C to +70°C


Relative humidity use ≤80% HR

Altitude use <2000m

4-4 Compliance with international standards

Electrical safety (EN 61010-1:2001)

CEI 1010-1 EN61010 NF-C 42020 VDE 0411

- Double insulation: 
- Pollution level: 2
- Installation category: III according to CEI 664
- Allocated voltage: 600V

4-5 Electromagnetic compatibility

- Emission (EN 61326-1:2006)
- Immunity (EN 61326-1:2006)

Maximum influence in the presence of conducted radio frequencies: 3 times the accuracy class if the length of the measured circuit is >3m

5 SUPPLY

To order MS306

Delivery:

- 1 multimeter
- 1 user's manual
- 2 test probes

6 MAINTENANCE

Only use the specified spare parts for maintenance. The manufacturer shall not be held liable for any incident occurring following repairs carried out by a party other than its after-sales service or approved repairers.

6-1 Battery and fuse change

Opening the multimeter:

Open the device by removing the black over.

6-1-1 Changing the battery

Open the device. Change the battery if the buzzer does not function when the VΩ and COM inputs are in short-circuit on the Ω×1 caliber. Ensure that the battery is the right way up.

6-1-2 Changing the fuses

Open the device. Use the same type of fuses to ensure the safety of users and of the device.

A and COM = (1A fuse),

10A and COM = (10A fuse).

6-2 Storage

If the multimeter is not used for a period of over 60 days, remove the battery and store it separately.

For a shorter period, avoid leaving the multimeter in ohmmeter position. There is a risk of premature battery wear if the tips come into contact with it.

6-3 Cleaning

The multimeter must be disconnected from all electricity sources.

To clean the casing, use a cloth dampened with soapy water. Wipe over with a damp cloth. Dry quickly with a dry cloth or forced air.