Iskra MIS, d.d.

MI 7056

APPLICATION INSTRUCTIONS

1. GENERAL DESCRIPTION

Due to small dimensions and electrical characteristics the MI 7056 multimeter is intended for a wide range of users. It is especially convenient for service workshops where electrotechanical and radio-television apparatuses are repaired. Its main advantage is a large choice of measuring ranges as well as high input resistance. It is possible to measure DC and AC voltages and currents, amplification or weakening on four-poles and resistance. Measuring wires and connection sockets are safe. A rubber border increases mechanical resistance of the instrument, and makes the instrument user-friendly.

2. TECHNICAL DATA

- ratings: 23
- length of basic scales: approx. 87 mm
- pointer tilt: 0 … 100°∠
- accuracy class: 2.5
- characteristic resistance: 20 kΩ / V_{DC}
  6,67 kΩ / V_{AC}
- dimensions: 104 x 143 x 40 mm
- mass: approx. 350 g

3. RATINGS WITH CHARACTERISTIC DATA

3.1 VOLTAGE RATINGS

DC		AC		
Voltage	Internal resistance	Voltage	dB[1] scale	Internal resistance
100 mV	2 kΩ	10 V	-10dB...+22dB	66,7 kΩ
1 V	20 kΩ	30 V	+10dB	200 kΩ
10 V	200 kΩ	100 V	+20dB	667 kΩ
30 V	600 kΩ	300 V	+30dB	2 MΩ
100 V	2 MΩ	600 V	+40dB	4 MΩ
300 V	6 MΩ			
600 V	12 MΩ			

[1] 0 dB corresponds to 0.775 V / 600 Ω (1 mW / 600 Ω)

3.2 CURRENT RATINGS

DC		AC	
Current	Voltage drop approx.	Current	Voltage drop
50 µA	100 mV	3 mA	1,5 V
1 mA	500 mV	30 mA	1,6 V
10 mA	500 mV	300 mA	1,6 V
100 mA	500 mV	3 A	1,8 V
1A	190 mV		

3.3 RESISTANCE RANGES

Measuring range and scale middle		Max. measuring current [2]	Battery supply source
x 1	1 Ω ... 35 Ω ... 5 kΩ	45 mA	1,5 V (IEC R6)
x 10	10 Ω ... 350 Ω ... 50 kΩ	4,5 mA	
x 100	100 Ω ... 3,5 kΩ ... 500 kΩ	0,45 mA	

[2] At battery voltage 1.5 V

4. ACCURACY AND INFLUENCES

4.1 ERROR AT REFERENCE CONDITIONS

Stated errors are valid at horizontal position, at ambient temperature 20°C, at sine form of alternating signals of frequency 50 … 60 Hz under the condition that the vave of the alternating signal does not deviate for more than 1% from the sine curve.

Current and voltage ratings:

- direct and alternate: ± 2.5 % of range

When measuring within the range from 0 to 30 mA, circuit resistance should be min. 150 kΩ.

- resistance ratings: ± 2.5 % of scale length

4.2 INFLUENCE OF FREQUENCY

- all alternating ratings: ± 2.5 % within the frequency range from 30 Hz to 1 kHz

4.3 TEMPERATURE INFLUENCE

At modified ambient temperature for 10 K within the range from 0 to 40°C

- direct ratings: ± 1 % of range
  100 mV / 50 µA: ± 2.5 % of range
- alternating ratings: ± 1.5 % of range

5. CONFORMITY WITH INTERNATIONAL STANDARDS

- Electrical safety **(EN 61010-1)**
  - Installation catergory: **CATIII 300V max, CATII 600V max**
  - Degree of pollution: **2**
- Electromagnetic compatibillity
  - Emission: **EN 50081-2**
  - Immunity: **EN 50082-2**

6. PROTECTION AGAINST OVERLOAD

The measuring system is protected against overload with silicon diodes. A rating selector switch and a printed circuit are protected with F 3.15 A fuse.

Fuse	Switching capacity	Dimensions (mm)
F 3,15 IEC 127	1 kA, 440 V_{AC} cos φ = 1,0	∅ 6,3 x 32

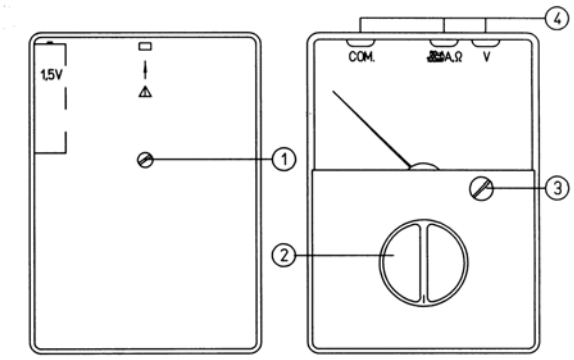
7. BATTERY FOR MEASURING RESISTANCE

1 x 1.5 V IEC R6; a battery which is protected against the discharge of electrolyte is recommended.

8. GENERAL INSTRUCTIONS

For correct and safe application of the meter the following data should be considered:

During the measurement put the instrument, which is protected with the rubber border, in a horizontal position. Insert a battery in order to measure resistance. Remove the rubber protector and the instrument base, and insert the 1.5 V battery (IEC R6) into its bed. The battery is used only for supplying ohmic ranges. The contacts should be clean and reliable. Check the battery condition by setting the ratings selector switch to Ω x 1 range. Short circuit connection terminals COM and 50 µA, 100 mV, A, Ω, and set final tilt with the knob (0 on Ω scale). If this can not be set or if the tilt is not constant, replace the battery. Completely switch off the instrument before removing the base.



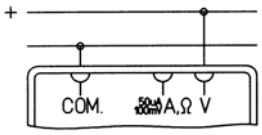
1.A knob for the regulation of the pointer zero position
2.Ratings selector switch
3.A knob for zero setting on Ω scale
4.Connection safety sockets

1. Check and correct, if necessary, the zero position of the pointer when the instrument is switched off. After cleaning the transparent window, eliminate eventual static electrification with a contact or a humid mop.
2. Set the ratings selector switch to the required rating. When measuring current and voltages start at the highest rating and then change over to the corresponding lower rating. The circuit is not interrupted. Be careful about upper limits of ratings as well as correct polarity of terminals. After the measurement set the selector switch to the highest voltage rating.
3. Set zero on ohmic ratings at short circuited terminals COM and 50 µA, 100 mV, A, Ω.
4. Consider more detailed instructions in the following chapters for meter connection.

9. MEASURING INSTRUCTIONS

9.1 MEASUREMENT OF DC VOLTAGES

9.1.1 Direct measurement of voltage up to 600 V (20 kΩ/V)

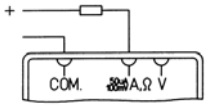


Ratings selector switch:
600 V … 1 V_{DC}
Reading: a black scale V, A_{DC}

9.2 MEASUREMENT OF DC CURRENTS

Connect the instrument in series with the user into the conductor which has lower voltage towards earth. For safety's sake this voltage should not exceed 600 V.

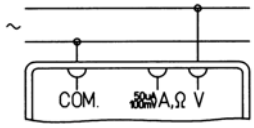
9.2.1 Direct measurement of currents up to 1 A and voltage 100 mV



Ratings selector switch:
1 A … 50 µA, 100 mV
Reading: a black scale V, A_{DC}

9.3 MEASUREMENT OF AC VOLTAGES

9.3.1 Direct measurement of voltages up to 600 V



Ratings selector switch:
600 V … 10 V_{AC}
Reading: a red scale

9.3.2 Measurement of amplification (weakening) in decibels

The dB scale enables you a direct finding of amplification (weakening) at voltage measurement on four-poles. Amplification or weakening is proportional to logarithm ratio of voltage square at input and output of a four-pole in decibels (dB). The values in dB are marked with a positive sign for amplification, and with a negative sign for weakening.

A decibel scale is correspondingly divided into positive and negative values from a starting point 0 dB (level 0). The starting point 0 dB is defined with 0.775 V voltage according to the international standards.

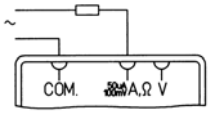
Voltages are measured by the described method of measuring AC voltages. At 10 V rating the decibels are read directly, while at other ratings the rating constant should be added up to the read value by the table:

Rating (V)	10	30	100	300	600
Constant	0	+10	+20	+30	+40

9.4 MEASUREMENT OF AC CURRENTS

Connect the instrument in series with the user always into the conductor with lower voltage towards earth. For safety's sake this voltage should not exceed 600 V.

9.4.1 Direct measurement of currents up to 3 A

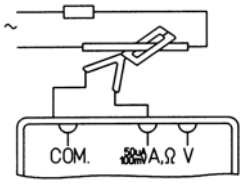


Ratings selector switch:
3 A … 3 mA_{AC}
Reading: a red scale V, A_{AC}

At measurement at 3 A rating, the measurement should last max. 1 minute.
At measurement at 3 mA rating, the circuit resistance should be min. 150 kΩ.

9.4.2 Measurement of current by means of a clamp-on meter

For measurement of AC current without interruption use a clamp-on meter.



Ratings selector switch:
regarding the ratio
Reading: red scale V, A_{AC}

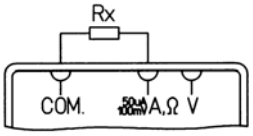
Consider all instructions for measurement with the clamp-on meter.

9.5 MEASUREMENT OF RESISTANCE

Periodically check the battery condition and replace a used up battery in due time. Before the measurement of resistance always make sure that there is no voltage on the measured resistor. Capacitors should be discharged.

At transition to another rating, set the pointer to a final tilt (0 on Ω scale). When testing the semiconductor, the battery positive pole should be on COM socket.

In Ω x 1 range the battery is extremely loaded, therefore the measurement should be as short as posible.



Ratings selector switch:
Ω x 1 … Ω x 100
Reading: Ω scale

Short circuit COM plug-in sockets and 50 µA, 100 mV, A, Ω and set the pointer to the final tilt (0 on Ω scale) with a knob.

10. MAINTENANCE

A special maintenance is not required. Periodically check the battery condition and voltages. A used up battery should not be left in the meter. The battery contacts should be clean and should have a reliable contact. If the instrument is not used for a longer period of time, take the battery out of the meter.

10.1 REPLACEMENT OF A BATTERY AND A FUSE

Carefully remove the rubber border. Remove the base by pressing the locking ring in the middle of connection sockets on the meter rear side with a screwdriver or a similar tool. The meter should be DISCONNECTED when removing the rubber border and the base!
Replace the battery and the fuse.

10.2 CLEANING

To clean the instrument use a soft mop and a brush. Eventual static electrification of the window which could influence in the measurement should be removed with an anti-static coating. Remove the residue of electrification contact or a humid mop. Use alcohol to clean dirt.

11. REPAIR AND SERVICING

Please contact an authorised service for repair, servicing and purchase of spare parts.

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