SKB EP®

MIKO-2.3

Microohmmeter
Milliohmmeter
Kiloohmmeter
Thermomether

Features and benefits:

- 4 measurement functions in 1 unit
- The smallest microohmmeter (2.7 kg) with test current of up to 1 000 A
- Self-tuning to the measurement object
- Auto save of the measurement results
- Settable measurement start delay
- Test unit auto switch off

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4 measurement functions in 1 unit

When you carry out objects' complex diagnostics specialized measurement means are required to each type of electric equipment. However, you can replace all those instruments by just one item: multi-purpose MIKO-2.3 micromillikiloohmmeter.

- **MICROOHMMETER** mode is designed to measure DC resistance of any switching equipment, as well as non-demountable or demountable connections.
  Resistance range: from 1 μΩ to 10^5 μΩ.
  Test current: from 10 A to 1 000 A.
- **MILLIOHMMETER** mode is designed to measure DC resistance in inductive circuits (transformers, electric motors, electromagnets, etc.).
  Resistance range: from 0,1 mΩ to 10^6 mΩ.
  Test current: from 0,5 mA to 5 A.
- **KILOOHMMETER** mode is designed to measure resistances of ballast, shunt, additional and other resistors in the presence of induced voltage up to 5 kV, as well as without induced voltage.
  Resistance range: from 0.1 kΩ to 300 kΩ.
  Test current: from 5 μA to 15 mA.
- **THERMOMETER** mode is designed to measure temperature of oil, water, air, and any other non-aggressive environments.
  Temperature range: from -20 ºC to +120 ºC.

Self-tuning to the measurement object

Each of four modes identificates automatically with the appropriate test cable connection.

Settable measurement start delay

You have an opportunity to preset measurement start delay. This function allows you to set remote potential contacts before the operation process. Measurements start on expiry of a preset period of time after the command issue.

In-built battery, and small dimensional parameters

MIKO-2.3 micromillikiloohmmeter has a weight of 2.7 kg and small dimensions of 150 x 190 x 75 mm. This instrument has an opportunity to produce test current up to 1 000 A. The above peculiarities ensure complete autonomy of the instrument over the vast territory of substation or facility.

Due to a combination of functional and dimensional parameters MIKO-2.3 achieves leading positions. Moreover, nowadays there is no analogue that combines measurement functions of 4 units: microohmmeter, milliohmmeter, kiloohmmeter and thermometer.

Auto save of the measurement results

There are 2 archives implemented into the instrument. 62 measurement results can be recorded into the archive in the microohmmeter mode, and 63 results can be recorded in the milliohmmeter mode.

The archive allows to store, view or delete measurement results, as well as to transfer them to a PC. You should use a special MIKO archive programm to transfer data to the PC and maintain the measurement archive.

Test unit auto switch off

This function is designed to save battery power. When the charger is not connected, the measuring unit automatically turns off one minute after the completion of the last action. When the charger is connected automatic switch off is not performed.

Application field: for DC resistance measurements and for temperature measurements of various parts of disconnected electric equipment.

General features

Power supply	AC 100-242 V, 50 Hz
Power supply	DC 100-300 V
Consumed power does not exceed	60 W
Battery charge time	5 min
Battery lifetime	> 5 years
Built-in memory	100 measurements
Dimensions	150 × 190 × 75 mm
Test block weight	2.7 kg
Standart complete set weight	9.5 kg
Technical lifetime	10 years
Warranty	13 months
Calibration period	1 year

Environment

Environmental protection	IP 20
Operating temperature	from -20 ºC to +40 ºC
Storage temperature	from 0 ºC to +55 ºC
Transportation temperature	from -20 ºC to +55 ºC
Relative humidity	95% (non condensing)

Interface

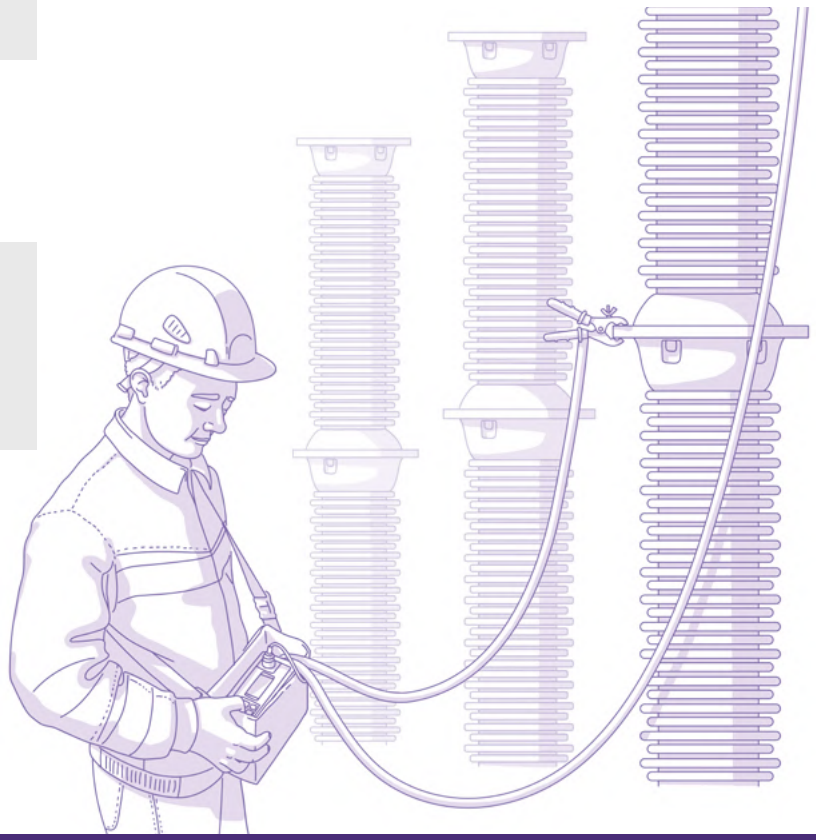
PC communication	RS-232
Display	Alpha-graphic 6 x 2.5 cm
PC software	Windows®-based analysis software
Interface language	English / Russian
User's manual language	English / Russian

Measurement features

Measurement principle	4-wire Kelvin method
Resistance range	
MICROOHMMETER	от 1 μΩ до 10^5 μΩ
MILLIOHMMETER	от 0,1 mΩ до 10^6 mΩ
KILOOHMMETER	от 0,1 kΩ до 300 kΩ
Measured temperature range in thermometer mode	from -20 °C to +120 °C
Resolution	0.1 μΩ
Accuracy	
MICROOHMMETER	±0.2 %
MILLIOHMMETER	±0.2 %
KILOOHMMETER	±0.5 %
THERMOMETER	±1.0 °C
Test current	
MICROOHMMETER	
submode «no CT» / «with CT»	from 10 A to 1 000 A
submode «with CT», «Tmax»	from 100 A to 400 A
MILLIOHMMETER	from 0,5 mA to 5 A
KILOOHMMETER	from 5 μA to 15 mA
One-measurement time	
MICROOHMMETER	
submode «no CT»	no more than 2 s
submode «with CT»	no more than 30 s
submode «with CT», «Tmax»	no more than 20 s
MILLIOHMMETER	from 10 to 900 s
KILOOHMMETER	no more than 3 s
Number of digits in the output of the measurement result	4

Safety and Certificates

Thermal protection	Protects all sensitive components, avoiding any damage due to over-heating
Safety	IEC 61010-1
EMC	IEC 61326-1
Electric shock protection class	Double or reinforced isolation



High-voltage or auto circuit breakers
(oil-blast, SF6, vacuum, air-blast, electromagnetic)

- DC electrical resistance measurement of contact connections;
- DC electrical resistance measurement of current leads;
- DC electrical resistance measurement of relays and contactors.

Releasing, connecting, short-circuiting switches

- DC electrical resistance measurement of contact connections.

Bolted, welted or brazed joints of current leads, busbars and cable connections

- DC electrical resistance measurement of contact connections.

Fuses and fuse-disconnectors

- DC electrical resistance measurement of conducting cartridge of fuse-disconnector.

PKV

MIKO-7M(A), 8M(A), 9(A)

We recommend you to check our offer for **PKV-group** instruments and for **MIKO-7M(A), MIKO-8M(A), MIKO-9(A)** milliohmmeters.
More information is available at our website www.skbpribor.com

Electric installations of buildings and constructions

- DC electrical resistance measurement of contact connections.

Railways

- Wagon wheel pairs resistance measurement;
- Rail connections resistance measurement.

Generators, compensators, electric motors

- Metallic bonding resistance measurement.

Load-break switches

- DC resistance measurement of main contacts connection.

Power cable lines

- Cable lines monitoring.

Current transformers

- Transformer secondary winding DC resistance measurement.

Voltage transformers
(electromagnetic and capacitive)

- Object winding DC resistance measurement.

Power transformers, autotransformers and oil-immersed reactors

- Transformer winding DC resistance measurement.

Compensatory, current limiting, and other HV circuit breaker resistors

- Active DC resistance measurement.

Metal-clad switchgear of internal and external installation

- DC resistance measurement.

Standard complete set

№	Item	Description	Order №
1	MIKO-2.3 test block	Instrument and documents: Calibration Certificate, User's Manual, and Log book.	SKB025.01.00.000
2	Battery charger	Type BC-1A (ЗУ-1А), m = 0.55 kg. Is designed to recharge the battery during resistance measurement process.	SKB023.20.00.000
3	Microohmmeter cable K162	L1 = 2.3 m, L2 = 1.1 m, m = 2.9 kg. Test current is up to 900 A.	SKB023.02.00.000-01
4	Potential spring-loaded contact (2 pcs)	This item is used to avoide high transient resistance between an input pin and a clamp of the instrument.	SKB023.21.00.000
5	Potential pin contact (2 pcs)	This item is used to avoide high transient resistance between an input pin and a clamp of the instrument.	SKB023.22.00.000

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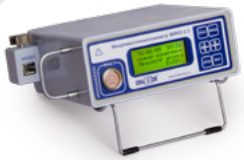

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6	Milliohmmeter cable K233	L1 = 2.0 m, L2 = 6.0 m, m = 0.8 kg. This cable is designed to work with power transformers of 110 kV and below. Input pin is up to 37 mm.	SKB023.07.00.000-02
7	Kiloohmmeter cable K322	L1 = 3.4 m, L2 = 2.1 m, m = 0.65 kg. The cable is used to measure additional, shunt, and dividing resistances in the presence of induced voltage or without it.	SKB023.06.00.000-01
8	Thermometer cable K411	L = 1.8 m, m = 0.075 kg. This cable is used to measure oil, water or air temperature.	SKB023.08.00.000
9	RS-232 interface cable	Cable 1 x 1.5 m is used to communicate to the PC, to transfer measurement results, as well as to carry out remote control from a PC.	SKB023.11.00.000
10	Mains extension cable	Extension cable 1 x 11 m to connect battery charger when the instrument is placed at the input of the high-voltage circuit breaker.	SKB023.16.00.000
11	Shunt	Type 75ShSM M3 (75ШСМ М3) to test the operability of the instrument.	-
12	Instrument stand	This stand allows to install MIKO-2.3 on any flat surface.	SKB023.04.00.000
13	Zero resistance equivalent	Resistance zero point accuracy check. Value is 0.000 μΩ.	SKB023.15.00.000
14	Portable bag	A special bag with battery charger holder for instrument's transportation. This bag provides additional mobility during operation process.	SKB123.02.01.000
15	Tool bag	Robust, convenient, wearproof bag for MIKO-2.3 cables transportation.	SKB123.02.02.000

Optional complete set

№	Item	Description	kV	L	W	Order №
16	Manipulating rod 35 kV	The rod is designed to ensure convenient connection to contacts of a high-voltage object. The rod is completed with a clamp with current and potential contacts connected by wires with the measurement platform. Test cables are connected to the measurement platform from the ground.	35	2.2 m	3.4 kg	SKB110.41.00.000
	Manipulating rod 110 kV		110	3.7 m	4 kg	SKB110.41.00.000-01
	Manipulating rod 220 kV		220	5.1 m	4.6 kg	SKB110.41.00.000-02

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Optional complete set

№	Item	Description	Order №
MICROOHMMETER CABLES			
17	Microohmmeter cable K161	L1 = 0.9 m, L2 = 0.9 m, m = 1.5 kg. Test current is up to 1 000 A.	SKB023.02.00.000
	Microohmmeter cable K163	L1 = 4.5 m, L2 = 1.0 m, m = 4.6 kg. Test current is up to 500 A.	SKB023.02.00.000-02
	Microohmmeter cable K164	L1 = 3.8 m, L2 = 1.7 m, m = 4.6 kg. Test current is up to 500 A.	SKB023.02.00.000-03
	Microohmmeter cable K165	L1 = 10.0 m, L2 = 1.0 m, m = 9.2 kg. Test current is up to 500 A.	SKB023.02.00.000-04
18	Microohmmeter cable K151	L1 = 0.9 m, L2 = 0.9 m, m = 0.5 kg. Test current is up to 200 A. Lightweight version of K161 cable.	SKB023.03.00.000
	Microohmmeter cable K152	L1 = 2.27 m, L2 = 1.1 m, m = 1.0 kg. Test current is up to 200 A. Lightweight version of K162 cable.	SKB023.03.00.000-01
	Microohmmeter cable K153	L1 = 5.0 m, L2 = 5.0 m, m = 2.9 kg. Test current is up to 200 A. Lightweight version of K165 cable.	SKB023.03.00.000-02
19	Microohmmeter cable K154	L1 = 1.1 m, L2 = 1.9 m, m = 0.8 kg. The cable has two needle-type contacts, potential contact is spring-loaded.	SKB023.05.00.000
20	Microohmmeter cable K155	L1 = 0.9 m, L2 = 2.3 m, m = 1.4 kg. There is one needle-type contact and one crocodile clamp + G-clamp, potential contact is spring-loaded.	SKB023.13.00.000
21	Microohmmeter cable K121	L1 = 1.8 m, L2 = 1.8 m, m = 0.3 kg. This cable should be used together with one of K161 ÷ K165 cables.	SKB023.09.00.000

Optional complete set

№	Item	Description	Order №
MILLIOHMMETER CABLES			
22	Milliohmmeter cable K236	L1 = 6.5 m, L2 = 6.5 m. This cable is designed to work with power transformers of 500 kV and below. Input pin is up to 37 mm.	SKB023.07.00.000-04
23	Milliohmmeter cable K238	L1 = 9.0 m, L2 = 9.0 m. This cable is designed to work with power transformers of 110 kV and below. Input pin is up to 37 mm.	SKB023.07.00.000-06
24	Milliohmmeter cable	L = 1.1 m. Probe has two spring-loaded contacts: one current and one potential. The cable enables access to inaccessible or tiny inputs of conductive circuits of electric equipment.	SKB023.28.00.000
25	Milliohmmeter cable K239	L1 = 6.5 m, L2 = 6.5 m. This cable is designed to work with power transformers of 500 kV and below. Input pin is up to 80 mm.	SKB023.25.00.000
26	Milliohmmeter cable extension K240	Extension cable is used together with cables K238 or K239.	SKB023.24.00.000
27	Milliohmmeter cable K235	L = 3.0 m. Test cable for electric motors, electromagnets, current transformers, etc.	SKB023.23.00.000
KILOOHMMETER CABLES			
28	Kiloohmmeter cable K321	L1 = 0.8 m, L2 = 0.8 m, m = 0.4 kg. The cable is used to measure additional, shunt, and dividing resistances in the presence of induced voltage or without it.	SKB023.06.00.000
29	Reference inductor adaptor	Adaptorfor the laboratories: inspection / calibration of the instrument.	SKB023.12.00.000

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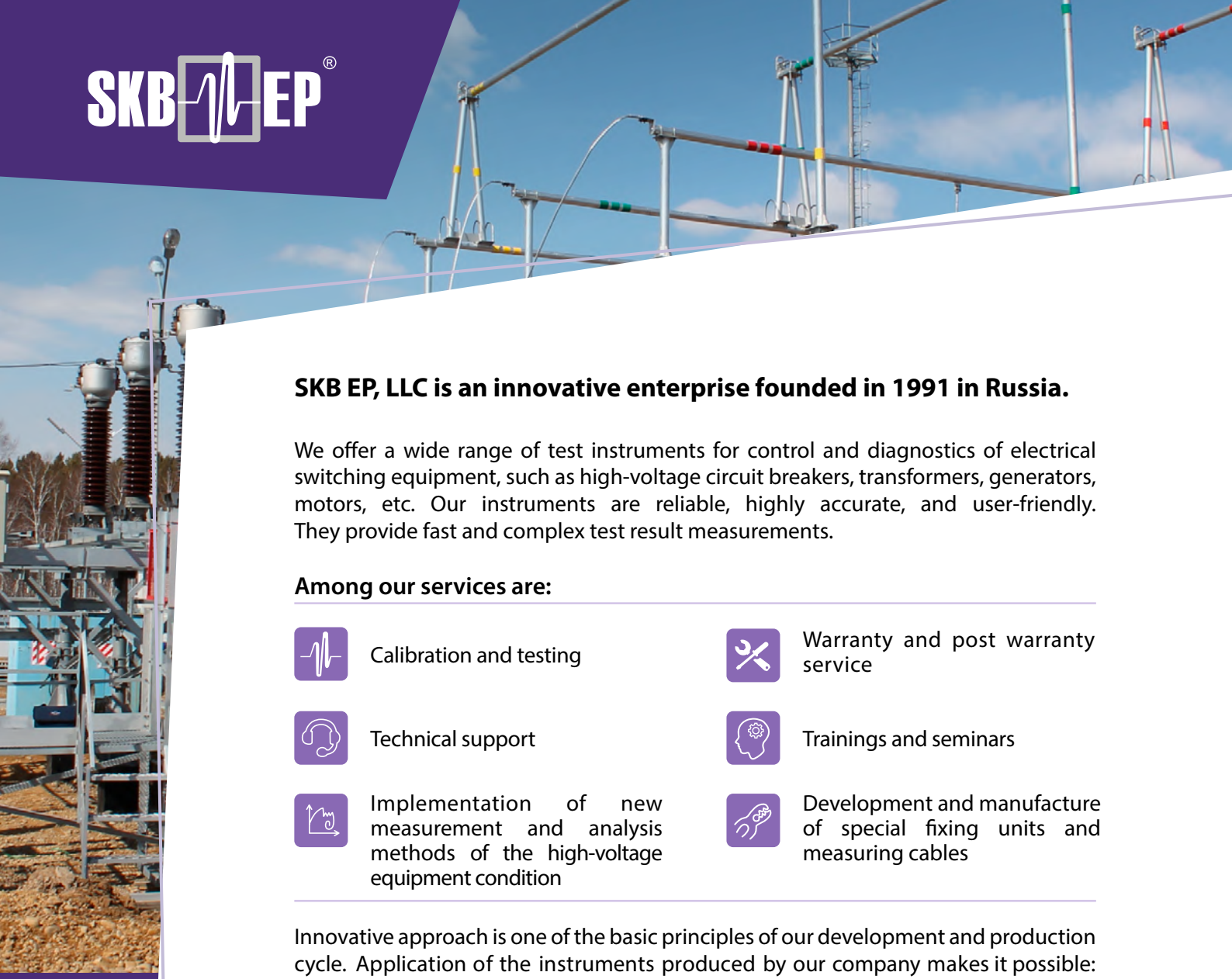

SKB EP, LLC is an innovative enterprise founded in 1991 in Russia.

We offer a wide range of test instruments for control and diagnostics of electrical switching equipment, such as high-voltage circuit breakers, transformers, generators, motors, etc. Our instruments are reliable, highly accurate, and user-friendly. They provide fast and complex test result measurements.

Among our services are:

- Calibration and testing
- Warranty and post warranty service
- Technical support
- Trainings and seminars
- Implementation of new measurement and analysis methods of the high-voltage equipment condition
- Development and manufacture of special fixing units and measuring cables

Innovative approach is one of the basic principles of our development and production cycle. Application of the instruments produced by our company makes it possible:

- to save time for diagnostics and control of high-voltage equipment;
- to simplify working process;
- to reduce the costs for equipment repairs.

>13,000

Today we have more than 13 000 loyal customers. Our instruments are successfully applied in:

- energy systems;
- industrial enterprises;
- railways.

Please visit our website to find more information about our company, instruments and provided services.

www.skbpribor.com

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