

Milliohmmeter MIKO-8

Certificates:

Safety Test Certificate IEC 61010-1:2001 on the MIKO-8
EMC Compatibility 61326-1:2005 on the MIKO-8

MIKO-8 is included in Russian Register of Innovative Products under #241, valid until 12.10.2018

MIKO-8 is included in Russian State Register under #59506-14, valid until 24.12.2019

Warranty: 36 months

Service life: 10 years



DC current resistance measurement in inductive and noninductive circuits in the range from 10 μOhm ÷ 10 k Ohm for the currents of up to 10A

- Windings of power transformers, instrument current transformers, electromagnets and electric motors;
- Compensatory, current-limiting and other resistors of high-voltage circuit breakers;
- Contacts and contact connections of power and signal circuits;
- Cables.

OLTC in-place check mode (DRM method):

Measurements in milliohmmeter mode and in in-place check mode complement each other and provide a comprehensive picture of the state of transformer.

OLTC "in-place" check mode allows carrying out of in-place check and diagnostics of OLTC with current-limiting resistors without removing the contactor tank covers. This mode involves measuring of instantaneous current passing at first through the transformer cover and then through OLTC contracts at switching from one tap to another. A graph of current variance at contacts switching is drawn up and the time of switching as well as the general technical condition of the instrument is checked on its basis.

Analysis of the acquired graphs provides not only for sorting out of elements by fault-free/faulty criteria but also for defining the nature of the defect allowing eliminating of fault-free OLTCs opening.

- express diagnostics of OLTC transformer technical condition at any weather environment;
- construction of assessment diagram of contactors' operation without OLTC tank opening;
- review of the graphs of the measured item on the instrument itself;
- defining of OLTC fault location: for instance, identifying of interruption of current-limiting resistors, poor selector contacts, etc.

The results of measurements and calculations are shown on a big color graphic display.









Milliohmmeter MIKO-8 includes all advantages of service functions of MIKO-7 with the advanced software:






- Automatic selection of the measuring range and setting of the required measuring current;
- Automatic compensation of thermal electromotive force in the external circuit of resistance measurement;
- Automatic inductive load measurement. The instrument automatically defines the moment of resistance and stops the measuring process;
- Automatic calculation of relative deviations of winding resistance at three phases against each other;
- Automatic recalculation of linear resistance of windings connected with delta or star connection to the phase winding resistance;
- Automatic recalculation of winding resistance measured at current temperature to resistance at the certified temperature (with due regard to winding material);
- Automatic calculation of deviations measured and normalized to the certified temperature of winding resistance in relation to the certified values of resistance;
- Automatic calculation of winding temperature based on its measured and certified value of resistance and certified temperature;
- Automatic stopping of measurement process.
- High level of protection and safety conformance in regard to: exceeding of measuring current; polarity reversal of cable ends in accumulator storage battery; electromotive force (emf) of self-induction; a set of required protective means against superheat of the measuring unit; protection grounding contact in the mains plug and safety earthing terminal on the case of the measuring unit.
- Output signal power control (0.3; 1; 5; 20; 62);
- Power from the mains and external accumulator storage battery;
- History of measurements stored in the instrument and PC connection through USB.

Specifications

Specifications	Value
Resistance range, Ohm	10 μ Ohm ÷ 10kOhm
Maximum permissible intrinsic error of resistance measurement	± (0.1%+0.5 μ Ohm)
Measuring current intensity, A	0,015 ÷ 10
Relative drift of measuring current intensity, %/s	±0.002
Maximum output voltage, V	22
Set output power limits, W	0.3; 1; 5; 20; 62
Power supply: network voltage, V	100÷242
power voltage from the battery, V	100÷300
Power supply voltage from the external accumulator storage battery, V	11 ÷ 14
Maximum consumed power, W	120
Dimensions, mm	270x250x130
Operation temperature range, °C	-20 ÷ +50
IP for transportation	IP64
IP rating in operating state	IP20
Maximum measuring unit weight, kg	3.2
Interface language	English
User manuals language	English
Calibration interval, year	3

Recommended package of the Instrument

Photo	Item, Index	Application	Recommended complete set (pcs.)
Standard complete set:			
	MIKO-8 measuring unit CKБ032.00.00.000	Instrument with the basic software and accompanying documents, Mains cable, Ground wire, Cable USB 2.0, Zero resistance equivalent, Shunt and Attachment devices set kit.	1
Additional complete set (on order):			
Select at least one measuring cable:			
	Measuring cable CKБ032.18.00.000	Cable for ground measurement of TS – 35kV. Allows control from transformer cover (35kV ÷ 500kV). Alligator type clamps with the jaw of up to 40 mm (length – 8.5 m).	-
	Measuring cable CKБ032.21.00.000	Cable for ground measurement of TS – 35kV. Allows control from transformer cover (35kV ÷ 500kV). Alligator type clamps with the jaw of up to 80 mm (length – 8.5 m).	1
	Measuring cable CKБ032.19.00.000	Cable for resistance measuring in four-terminal winding in inductive and noninductive circuits. Cable is complete with 2 probes and 4 isolated alligator-type clamps A25C. (length - 3 m).	-
	Measuring cable with a fast-switching ground clamp CKБ032.26.00.000	Cable clamp is coupled with a fast-switching ground clamp providing for instant connection to the pins of the inputs with the help of the button at its bottom. Clamp jaw of up to 103 mm.	-
	Measuring cable extension CKБ031.20.00.000	For ground measurement of all TS (35kV ÷ 500kV). Recommended for application together with measuring cables SKB031.18.00.000 and SKB031.21.00.000. Length – 6.5 m	1
	Potential spring-loaded contact CKБ023.21.00.000	For convenient connection to the pin of the input. Recommended for application together with the cable SKB032.12.00.000	2
	Potential pin contact CKБ023.22.00.000		2

	A short-circuit cable clamp G50 jaw opening 45 mm CKБ032.13.00.000	Short-circuit cable for short-circuiting the secondary circuits. For in-place check of the transformer OLTCs (DRM method).	-
	A short-circuit cable clamp G75 jaw opening 70 mm CKБ032.13.00.000-01		1
	A short-circuit cable clamp G100 jaw opening 85 mm CKБ032.13.00.000-02		-
	Short-circuit cable CKБ035.31.00.000	Short-circuit cable for short-circuiting the secondary circuits. To be used for LTCs of power transformers and auto transformers (length - 12 m).	-
	Additional resistor CKБ032.25.00.000	For in-place OLTCs monitoring at apparent resistance of the winding of no more than 0.5 Ohm	1
	Battery power cable CKБ031.17.00.000	The cable is made in the form of elastic silicone tube resistant to low and high temperatures and corrosive media. Length - 5 m.	1
-	Software	For remote control of the analyzer.	-
	Cable and documentation bag CKБ126.06.00.000	Handy, sturdy and wear-resistant bag for carrying cables, documents and other additional component parts to MIKO-8.	1
-	Manipulating rod for equipment of up to 35kV (2.2 m) CKБ010.41.00.000	The rod is designed to ensure convenient connection to contacts of a transformer inputs. 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.	-
	Manipulating rod for equipment of up to 110kV (3.7 m) CKБ010.41.00.000-01		-
	Manipulating rod for equipment of up to 220kV (5.1 m) CKБ010.41.00.000-02		-

Area of the Instrument application

Test methods	Recommended Instrument
Power cable lines	
Monitoring of cable lines	MIKO-8, MIKO-7, MIKO-2.3
Current transformers	
Measuring of secondary resistance	MIKO-8, MIKO-9, MIKO-7, MIKO-2.3
Operates in the range of 10 m Ω ÷ 10 k Ω on the current of up to 10A, therefore, when measuring the resistance of the secondary current transformer windings the minimum output power shall be set as low as 0.3W, that will reduce the current amperage.	
Voltage transformers (electromagnetic and capacitive)	
Measuring of secondary resistance	MIKO-8, MIKO-9, MIKO-7, MIKO-2.3
Operates in the range of 10 m Ω ÷ 10 k Ω on the current of up to 10A, therefore, when measuring the resistance of the secondary current transformer windings the minimum output power shall be set as low as 0.3W, that will reduce the current amperage.	
Power transformers, autotransformers and oil-immersed reactors	
Measuring of transformer winding resistance	MIKO-8, MIKO-9, MIKO-7, MIKO-2.3
In-place estimation of the state of OLTC contactors (DRM-test)	MIKO-8, PKR-2M
Contactors operation oscillography	MIKO-8, MIKO-9, PKR-2, PKR-2M
Synchronous generators, compensators and AC/DC motors	
Measuring of winding resistance of the facility	MIKO-8, MIKO-9, MIKO-7, MIKO-2.3