

Control instrument of OLTC transformers PKR-2M

Certificates:

Safety Test Certificate IEC 61010-1:2001 on the PKR-2M
EMC Compatibility 61326-1:2005 on the PKR-2M

PKR-2M is included in Russian Register of Innovative Products
under #230, valid until 07.04.2018
PKR-2M is included in Russian State Register under #59602-15,
valid until 16.01.2020

Warranty: 36 months
Service life: 10 years



- **OLTS maintenance check.** PKR-2M is intended for mountable maintenance check of all type (both resistor and reactor type) on-load tap changers (hereinafter – OLTCs), as well as for in-place check, which enables to diagnose OLTCs with current-limiting resistors without removing the contactor tank cover.
- **OLTC in-place check mode (DRM-test).** OLTC in-place check enables to conduct express diagnostics of the OLTC technical condition without opening the tank or OLTC removing. This check enables to obtain the contactor switchover diagrams for a wide range of switching devices (except reactor type ones) and conduct the OLTC condition evaluation based on the obtained diagrams, that gives the reasons to denote a defect nature and grounds for decisions related to repair of these on-load tap changers.
- **Radial diagram measurement of the resistor and reactor type OLTCs.** The instrument is completed with a special transducer. Its interface with shafts of different drives is provided with a set of axes and bushings, which are installed without any tools by simply putting on the shaft extension. All characteristics are taken simultaneously based on three phases.
- **Resistor type OLTC contactor switchover oscillography.** The switchover oscillography enables to detect the actuation delay, non-simultaneity of in phase actuation and bouncing during switchover. All characteristics are taken simultaneously based on three phases.
- **Automatic self-adjustment to OLTC.** No additional elements (for example, resistors) or knowledge of resistances of current-limiting resistors of the checked instrument are required to measure the OLTC parameters. All adjustments to a specific OLTC are performed automatically in the instrument.
- The instrument is completed with special long calipers to be conveniently connected to some OLTCs (in this case, it is not necessary to drain oil from the contactor tank). The instrument may be connected to the on-load tap changer with measuring cables provided with alligator clips without contact calipers with oil being partially drained from the contactor tank or removal of the on-load tap changer from the transformer tank.

- **Self-contained power supply, storage, transfer and analysis of measurement results in the instrument and PC.** PKR-2M is equipped with inbuilt battery, which makes it more mobile and easy to use. The instrument is equipped with a large color high-brightness and high-contrast display. The measurement results are stored in the non-volatile memory of the instrument, on the external flash memory, and they may be transferred to the computer. Therefore, the instrument may be controlled by the PC. It enables to measure diagrams being inside a car with the compute.






The instrument is represented in two modifications

	PKR-2	PKR-2M
OLTC check mode	demountable	demountable and in-place
Inbuilt battery supply	none	available (operation time from 2 to 16 h)

Specifications

Specifications	Value
Time interval measuring range, sec	0.01 ÷ 1200
Maximum permissible intrinsic absolute error of time interval measurement, sec	$\pm(3+t_x) \times 10^{-4}$
Time interval measurement resolution ability, ms	± 0.1
Angular movement measuring range, degrees	2 ÷ 360
Maximum permissible intrinsic absolute error of angular movement measurement, degrees	± 0.56
Direct current intensity measuring range, A	1 ÷ 4
Maximum permissible intrinsic relative error of direct current intensity measurement, %	± 2
Direct current electric voltage measuring range, V	1 ÷ 20
Maximum permissible intrinsic relative error of direct current electric voltage measurement, %	± 5
Direct current electric voltage measurement range, Ohm	1 ÷ 20
Maximum permissible intrinsic relative error of direct current electric resistance, %	± 5
Resistance measurement sampling rate per channel, kHz	10 \pm 0.1
Maximum recording time (radial diagram measurement), min	20
Maximum recording time (oscillography using the DRM method), min	20
Number of computer communication channels, pcs	2 (USB, USB host)
Time of inbuilt battery operation in mixed mode (operation/standby), h	2 ÷ 16
Battery charge time from complete discharge till complete charge, h	2.5
Maximum consumed power in start standby mode, W	15
Maximum consumed power in measurement mode, W	210
Operation temperature range, °C	-20 ÷ +50
IP for transportation	IP64
IP rating in operating state	IP20
Maximum measuring unit weight, kg	6.1
Dimensions, mm	360x290x165
Interface language	English
User manuals language	English
Calibration period, year	3

Recommended package of the Instrument

Photo	Item, Index	Application	Recommended complete set (pcs.)
Standard complete set:			
	PKR-2M measuring unit SKB035.00.00.000	Instrument and accompanying documents, Angular movement transducer DP22, Ground clamp, Handle, Mains cable, Ground wire, Axis No.10 together with a bushing (for the OLTC drives of MZ-4.1; M3.2; M3-4 types), Cable and ancillary equipment carrying case.	1
	Measuring cable completed with a connector SKB035.24.00.000	Intrusive method of diagnosis. For connection to transformer LTC terminals inside the tank. Non-destructive method of diagnosis (DRM-test). For connection to transformer terminals up to 200 kV (inclusive).	1
	Short-circuiting cable with ground clamp G50 - ground clamp jaw opening 45 mm SKB032.13.00.000	For in-place check of the transformer OLTCs (DRM-test). Secondary circuit shorting.	1
Additional complete set (on order):			
	Contact caliper set in a special case	Contact calipers (7 pcs.) for connection to the OLTC contacts without oil discharge. Length 85 cm, complete with extension cable 155 cm.	1
		They are supplied in the convenient lockable carrying case.	
	DRM test lead SKB035.28.00.000	To be used together with the standard SKB035.24.00.000 test lead at non-destructive diagnosis (DRM-test) for connection to transformer and to auto transformer terminals above 200 kV.	-
	Short-circuiting cable with ground clamp G75 - ground clamp jaw opening 70 mm SKB032.13.00.000-01	For in-place check of the transformer OLTCs (DRM-test). Secondary circuit shorting.	-
	Short-circuiting cable with ground clamp G100 - ground clamp jaw opening 85 mm SKB032.13.00.000-02	In standard complete set - G50 (ground clamp jaw opening – 50.8 mm).	-
	A short-circuit cable SKB035.31.00.000	For in-place check of the transformer OLTCs (DRM-test). Secondary circuit shorting. To be used for LTCs of power transformers and auto transformers (length - 12 m).	-

Select the axis for setting a measuring sensor at the output shaft:

	Axis No.1 SKB035.25.01.000	For OLTC drives of BUL type	-
	Axis No.2 SKB035.25.02.000	For OLTC drives of PDP; MA-1; MAK-1 types	-
	Axis No.3 SKB035.25.03.000		-
	Axis No.4 SKB035.25.04.000		-
	Axis No.6 SKB035.25.06.000	For OLTC drives of PDP-4U type (when a manual drive is used)	-
	Axis No.9 SKB035.25.09.000	For OLTC drives of PDP-4U type (when an electric drive is used)	-
	Axis No.7 SKB035.25.07.000	For OLTC drives of MZ-4.1, MZ-4.4 types (when the electric drive is used)	-
	Axis No.8 SKB035.25.08.000	For OLTC drives of MZ-4.1, MZ-4.4 types (when the manual drive is used)	-
	Axis No.11 SKB035.25.11.000	For OLTC drives of SMA-7 (SMS-China), ED 100/200 S, ED 100/200 S types (MR-Germany) (when the manual drive is used)	-
	Axis No.12 SKB035.25.12.000	For OLTC drives of SMA-7 (SMS-China), ED 100/200 S, ED 100/200 S types (MR-Germany) (when the electric drive is used)	-
	Axis No.13 SKB035.25.13.000	For OLTC drives of VAKUTAP type manufactured by MR	-
	USB 2.0 A-B cable	For the instrument connection to PC (length – 1.8 m).	1

Area of the Instrument application:

Test methods	Recommended Instrument
Power transformers, autotransformers and oil-immersed reactors	
In-place estimation of the state of OLTC contactors (DRM-test)	PKR-2M, MIKO-8
Contactors operation oscillography	PKR-2M, PKR-2, MIKO-8
OLTC radial diagram measurement	PKR-2M, PKR-2