Status Active Unique accreditation record number in the Register of Accredited Conformity Assessment Bodies RA.RU.21HH33 Date of making an entry November 15, 2018 Type Testing laboratory Inclusion in the national part of the Unified Register No

• ACCREDITED PARTY

- DESCRIPTION OF ACCREDIDATION SCOPE
- ACCREDITATION
- STATE SERVICES
- APPLICANT
- ACCREDITED CONFORMITY ASSESSMENT BODY

Status Active Date of making an entry in the Register of Accredited Conformity Assessment Bodies November 15, 2018 Type Test laboratory Name of standard GOST ISO/IEC 17025-2019 General competency requirements for testing and calibration laboratories Unique accreditation record number in the Register of Accredited Conformity Assessment Bodies RA.RU.21HH33 Name of Accredited Conformity Assessment Body Testing Center of All-Russia Electrotechnical Institute - the Branch of the Federal State Unitary Enterprise «Russian Federal Nuclear Center — Zababakhin All-Russia Research Institute of Technical Physics» Abbreviated name of Accredited Conformity Assessment Body TC VEI Registered name FSUE «RFNC - VNIITF named after Academ. E.I. Zababakhin» Name of the Accredited Conformity Assessment Body head Milkin Evgenii Position of the Accredited Conformity Assessment Body head Head of the TC VEI Accredited Conformity Assessment Body phone number +7 4959378527 Accredited Conformity Assessment Body phone number +74959378518 Email address test-vei@vniitf.ru Website www.vniitf.ru Business address 111250, Russia, Moscow, Krasnokazarmennaya street, 12, bld. 3 id: 768294; 111250, Russia, Moscow, Krasnokazarmennaya street, 12, bld. 7 id: 768295;

111250, Russia, Moscow, Krasnokazarmennaya street, 12, bld. 8 id: 768296

Status Active Unique accreditation record number in the Register of Accredited Conformity Assessment Bodies RA.RU.21HH33 Date of making an entry November 15, 2018 Type Testing laboratory Inclusion in the national part of the Unified Register No

• ACCREDITED PARTY

DESCRIPTION OF ACCREDIDATION SCOPE

- ACCREDITATION
- STATE SERVICES
- APPLICANT
- ACCREDITED CONFORMITY ASSESSMENT BODY

Description of accreditation scope

Expansion of accreditation scope PK1RA-139 of March 20, 2025 **Confirmation of competence** PK1RA-139 of March 20, 2025 Show archive **Expansion of accreditation scope PK1RA-139 of March 20, 2025**

- <u>W/O CONFIGURATOR</u>
- <u>W/CONFIGURATOR</u>

Testing laboratory Signatures information

Description of accreditation scope

Expansion of accreditation scope PK1RA-139 of March 20, 2025 **Confirmation of competence** PK1RA-139 of March 20, 2025 Show archive <u>Expansion of accreditation scope PK1RA-139 of March 20, 2025</u>

- <u>W/O CONFIGURATOR</u>
- <u>W/CONFIGURATOR</u>

insulators; Ceramic Electrical insulator; Insulating accessories for Electrical equipment and ceramic devices; Electrical insulators; Insulating accessories for Electrical machines and

Testing laboratory Signatures information

111250, Russia, Moscow, Krasnokazarmennaya street, 12, bld. 3.
111250, Russia, Moscow, Krasnokazarmennaya street, 12, bld. 8.
111250, Russia, Moscow, Krasnokazarmennaya street, 12, bld. 7.
Product testing
Note
Electrical switchgear or protective equipment ; Plastic electrically insulating accessories; AC high-voltage circuit-breakers, contactors and reversers (high-voltage power circuit-breakers); Other vulcanized rubber products, not elsewhere classified; Hard rubber in all forms and products thereof; Porous vulcanized rubber flooring and matting; Wiring products; Electrical

equipment; Electrical pipes; Switchgear; Electrical switchgear or protective equipment packages; Other Electrical equipment; High-voltage fuses; Other electronic and Electrical leads and cables; Other Electrical conductors for voltages greater than 1 kV; Other Electrical conductors for voltages not greater than 1 kV; AC high-voltage disconnecting switches, short-circuiting switches, isolating switches, earthing switches; Other transformers for voltages not greater than 16 kVA; Electrical transformers; Electrical circuit switchgear or protection devices for voltages greater than 1 kV; Electrical circuit switchgear or protection devices for voltages not greater than 1 kV; Sections of electrical switchgear or regulating equipment; Electromotors, generators and transformers

HS code (EAEU)

8504 Electrical transformers, static Electrical conventors (for example, rectifiers), inductance coils and throttles:; 8504210000 - - not greater than 650 kVA; 8504221000 - - - greater than 650 kVA, but not greater than 1600 kVA; 8504229000 - - - greater than 1 600 kVA, but not greater than 10 000 kVA; 850423000 - - greater than 10000 kVA:; 850431 - - not greater than 1 kVA:; 850431800 - - - Other:; 850432000 - - greater than 1 kVA, but not greater than 16 kVA:; 8504320002 - - - - Instrument transformers; 850433000 - - greater than 16 kVA, but not greater than500 kVA:; 8504340000 - - greater than 500 kVA; 850450 - Other inductance coils and throttles:; 8535 Electrical switchgear or protective equipment for electrical circuits or connection to them or in electrical circuit (for example, breakers, switches, circuit-breakers, fuses, lightning conductors, voltage suppressors, voltage jump supressors, current collector, sliding contacts and other connectors, connecting boxes) for voltages greater than 1000 V:; 853590000 - Others:; 8535900008 - - Others; 8536 Electrical switchgear or protective equipment for electrical circuits or connection to them or in electrical circuit (for example, breakers, switches, circuit-breakers, relay, fuses, voltage suppressors, two-pin plugs and sockets, lamp holders and other connectors, connecting boxes and other connectors, connecting boxes) for voltages not greater than 1000 V; connectors for optical fibers, fiber-optic bundles and cables:; 853610 - fuses:; 8537 Remote controls, panels, consoles, tables, distribution boards and bases for electrical equipment fitted with two or more devices with items 8535 or 8536 for current control or distribution, including instruents or devices of group 90 and digital control apparatus, except for switchgears with item 8517:; 853720 - for voltages greater than 1000 V:; 854442 - - fitted by connecting accessories:; 854449 - - Other:; 854460 - Electrical conductors for voltages greater than 1000 V Other:; 8546 Insulators made of any materials:; 8546200000 - ceramic; 8546901000 - - plastic Measurement type/method

Environmental effect testing Long-term and accelerated high air humidity testing; Environmental effect testing Elevated operating environmental temperature testing; Environmental effect testing Low-temperature operating environmental temperature testing; Environmental effect testing Other environmental effect test methods; Non-destructive testing Exterior inspection and measurements; Physical-mechanical measurements of geometrical parameters (length, angle); Physical-mechanical measurements of physical quantities; Physical-mechanical determination of strength; other physical and mechanical investigation (testing) methods to determine physical and mechanical parameters; Functional testing of systems and structural elements; Electrophysical investigation (testing) methods without specification;

Calculated rates/measured range

Verification of nameplate data compliance range compliant/noncompliant; Absolute angle error range from -600 to 600 min; Protective coating adhesion range passed/failed; Active power range from 0 to 2000 kVr; Locking device range passed/failed; Interchangeability of parts range compliant/noncompliant; Interchangeability of replaceable identical parts range passed/failed; Water proofness range passed/failed from 91 to 95 %; Exterior range compliant/noncompliant; Holding time range from 0 to 100 h; Overall dimensions/setting dimensions /connecting dimensions range from 0 to 15000 mm; Overall dimensions range from 0 to 1000 mm; Geometrical dimensions range passed/failed from 0 to 20000 mm; Geometrical dimensions range from 0 to 50000 mm; Vector group range compliant/noncompliant; Pressure range from 0 to 0,9 MPa; Power core diameter range from 0,1 to 1000 mm; Dynamic withstand at short-circuits range passed/failed; Water diffusion range passed/failed; Length range from 1 to 100 m; Leakage path length for external insulation range from 0 to 50000 mm; Bending force range from 0 to 500 kN; Test voltage range from 0 to 1000 V; Test current range from 0 to 100

kA; Test current range from 0,1*10⁻³ to 600 A; Test current range from 10 to 100 A; Corrosionprotective coating quality range passed/failed; Protective enclosure surface quality range passed/failed; Quality of connection between accessories and insulation part range compliant/noncompliant; Water repellence class range from 1 to 7 null; Number of cycles range from 1 to 100000 cycles; Switching wear-resistance range passed/failed; Switching capacity passed/failed; Completeness range passed/failed; Completeness range range compliant/noncompliant; Accessory equipment range compliant/noncompliant; Structural dimensions range from 0 to 1000 mm; Protective enclosure structure range passed/failed; Gas concentration range from 0 to 1000 mln⁻¹; Absorption coefficient Calculated rate range; Safety coefficient range compliant/noncompliant; Rotational moment range from 0 to 50 kN*m; Marking range compliant/noncompliant; Marking and branding range confirmed/not confirmed; Marking and branding range compliant/noncompliant; Mass range passed/failed from 0 to 5000 kg; Mass range from 0 to 50 kg; Mass range from 0 to 5000 kg; Mass range from 0,5 to 5000 kg; Mechanical wear-resistance range passed/failed; Mechanical strength range passed/failed; Reliability range passed/failed; Maximum current peak (dynamic current) range from 0 to 200 kA; Lightning impulse voltage range from 0 to 20 kV; Voltage range from 0 to 20 kV; Voltage range from 0 to 35 kV; Voltage range from 0 to 38 kV; Voltage range from 0 to 42 kV; Voltage range from 0 to 50 kV; Voltage range from 0 to 6 kV; Short-circuit voltage Calculated rate range; AC voltage range from 0 to 2000 V; Power supply voltage from 0 to 1000 V; Current voltage range from 1 to 70 kV; Power-frequency voltage range from 0 to 10 kV; Powerfrequency voltage range from 1 to 230 kV; Actuating voltage range from 0 to 500 V; Outer diameter of insulated core range from 0,1 to 1000 mm; Pressure continuity of sliding earthing contacts range passed/failed; Continuity of protective circuit range passed/failed; Rated current range passed/failed from 0 to 12 kA; Identification and marking range compliant/noncompliant; Breaking capacity range passed/failed; Relative humidity range from 60 to 98 %; Relative current error range from -20 to 20 %; Voltage drop range from 0 to 1000 V; AC voltage range from 0 to 100 kV; AC voltage range from 0 to 230 kV; AC current range from 0 to 10000 A; AC current range from 0 to 12000 A; AC current range from 0 to 20 kA; AC current range from 0 to 200 kA; AC current range from 0 to 25 kA; AC current range from 0 to 50 A; AC current range from 0 to 6000 A; AC current range from 0,5 to 12000 A; Error Calculated rate range; Voltage transformer (VT) voltage scale transformation coefficient error range passed/failed from -20 to 20 %; Integrity and correctness of marking range passed/failed; Short-circuit losses Calculated rate range; Consumed power range from 0 to 100 kVT; Temperature rise Calculated rate range; Temperature rise range from 0 to 300 °C; Accuracy limit factor range compliant/noncompliant; Bending deflection range from 0 to 250 mm; Mark permanency range passed/failed; Torsional strength range passed/failed; Radial displacement range passed/failed from 0,01 to 10 mm; Disruptive load under bending range from 0 to 500 kN; Tensile disruptive force range from 0 to 500 kN; Tensile mechanical force during 1 min range from 0 to 500 kN; Force range from 0 to 500 N; Gas leakage rate Calculated rate range; Displacement range passed/failed from 0,01 to 10 mm; Proper time /closing time/opening time range from 0 to 100 s; Insulation resistance of the main circuit range passed/failed from 0 to 40,0 TOhm; Insulation resistance range sufficient/insufficient from 0 to 40,0 TOhm; Insulation resistance range from 0 to 40,0 TOhm; Winding insulation resistance range passed/failed from 0 to 40 TOhm; Winding insulation resistance range passed/failed from 0 to 40,0 TOhm; Winding insulation resistance range from 0 to 40,0 TOhm; DC winding resistance range from 10⁻⁶ to 100*10³ Ohm; DC resistance range from 0 to 1 Ohm; Protective circuit resistance range from 10⁻⁶ to 100*10³ Ohm; Protective condition range compliant/noncompliant; Surface condition coating range compliant/noncompliant; Actuating range passed/failed; Current root mean square range from 0 to 100 kA; Resistance to single shocks range passed/failed; Resistance to high relative humidity range passed/failed; Resistance to elevated environmental temperature range passed/failed; Lowtemperature resistance range passed/failed; Electrical arc resistance range passed/failed; Resistance to water penetration range passed/failed; Short-circuit current withstand range passed/failed; Short-circuit current withstand and load impact resistance range passed/failed; Dielectrical loss angle tangent range from 0,01 to 100 %; Water temperature range from +20 to +98 °C; Water temperature range from 20 to 100 °C; Air temperature range from -70 to +130 °C; Air temperature range from 0 to 300 °C; Temperature range from -60 to +85 °C; Temperature range from -60 to 0 °C; Temperature range from 0 to 300 °C; Temperature range from 0 to 85 °C;

Heat temperature range from 0 to 300 °C; Ambient temperature range from 0 to 300 °C; Thermal resistance at short-circuit range passed/failed; Circuital current range from 0,1*10⁻³ to 600 A; Current range from 0 to 10 kA; Current range from 0 to 100 kA; Current range from 0 to 200 kA; Current range from 0 to 200 kA; Current range from 0 to 32 kA; Current range from 0 to 63 kA; Current range from 10 to 100 A; Actuating current range from 0 to 30 A; Protective coating thickness range passed/failed from 5 to 5000 μ m; Angle error (voltage phase angle error) range passed/failed from -600 to 600 min; Torsion angle range from 0 to 90 degrees; Specific resistance Calculated rate range; Partial discharge range passed/failed from 1 to 100000 pC; Force range from 0 to 500 N; Tearing force range from 0 to 2 kN; Shear force range from 0 to 2 kN; Fixing devices range passed/failed; Operation range passed/failed; Electrical capacity range from 20 to 1*10° pF; Insulation strength range passed/failed; Electrical resistance range from 0 to 40 TOhm; Electrical insulation resistance range from 0 to 40,0 TOhm; Electrical resistance of power core range from 10⁻⁶ to 10*10³ Ohm; Shock energy range from 0 to 60 J Procedure

High-voltage switchgear. General specifications GOST R 55716-2013 Subclause 6.5; Instrument transformers. Part 1. General specifications GOST R 70507.1-2024 Subclause 9.1; Metalenclosed switchgear for rated voltage up to35 kV. General specifications GOST R 55190-2022 Subclause 8.10.4-8.10.6; Metal-enclosed switchgear for rated voltage up to35 kV. General specifications GOST R 55190-2022 Subclauses 8.4.6.1, 8.4.6.5-8.4.6.8, 8.4.6.10; Ceramic post insulators for voltages greater than 1000 V. General specifications GOST R 52034-2023 Subclause 8.6; Outdoor polymer post insulators for voltages 3–750 kV. General specifications GOST R 52082-2023 Subclause 8.9.7; Instruction High-voltage AC bridge MEP-5SA. Operation manual 4221-001-75617971-2007 RE Clause 4; Interstate standards accepted as RF National standards GOST 14794-79 Subclause 6.1; Interstate standards accepted as RF National standards GOST 14794-79 Subclause 6.10; Interstate standards accepted as RF National standards GOST 1983-2015 Subclause 9.3; Interstate standards accepted as RF National standards GOST 1983-2015 Subclause 9.6; Interstate standards accepted as RF National standards GOST 20.57.406-81 Subclauses 1.45, 1.56, 2.16.3; Interstate standards accepted as RF National standards GOST 20.57.406-81 Subclauses 1.45, 1.56, 2.18; Interstate standards accepted as RF National standards GOST 20248-82 clause 9; Interstate standards accepted as RF National standards GOST 20493-2001 Subclause 8.8; Interstate standards accepted as RF National standards GOST 2213-79 Subclause 7.7; Interstate standards accepted as RF National standards GOST 2213-79 Subclause 7.8; Interstate standards accepted as RF National standards GOST 22756-77 Subclause 3.1; Interstate standards accepted as RF National standards GOST 2933-93 Clause 7; Interstate standards accepted as RF National standards GOST 2933-93 Subclause 2.12; Interstate standards accepted as RF National standards GOST 2933-93 Subclause 3.12; Interstate standards accepted as RF National standards GOST 2933-93 Subclause 4; Interstate standards accepted as RF National standards GOST 2933-93 Subclause 5; Interstate standards accepted as RF National standards GOST 2933-93 Subclause 8.5; Interstate standards accepted as RF National standards GOST 2933-93 Subclauses 2.1-2.7; Interstate standards accepted as RF National standards GOST 2933-93 Subclauses 3.1-3.11; Interstate standards accepted as RF National standards GOST 2933-93 Subclauses 8.1 – 8.4; Interstate standards accepted as RF National standards GOST 2990-78 Subclauses 4.1, 4.4.1; Interstate standards accepted as RF National standards GOST 31996-2012 Subclauses 8.3.1; Interstate standards accepted as RF National standards GOST 31996-2012 Subclauses 8.3.2, 8.3.3; Interstate standards accepted as RF National standards GOST 3345-76 clauses2, 3, 4; Interstate standards accepted as RF National standards GOST 34839-2022 Subclause 9.2.1; Interstate standards accepted as RF National standards GOST 34839-2022 Subclause 9.2.2; Interstate standards accepted as RF National standards GOST 34839-2022 Subclause 9.2.4; Interstate standards accepted as RF National standards GOST 34839-2022 Subclause 9.5.1; Interstate standards accepted as RF National standards GOST 34839-2022 Subclause 9.5.2; Interstate standards accepted as RF National standards GOST 34839-2022 Subclause 9.5.3; Interstate standards accepted as RF National standards GOST 34839-2022 Subclauses 9.1.2, 9.2.3, 9.2.5; Interstate standards accepted as RF National standards GOST 3484.3-88 Subclauses 4.1, 5.1; Interstate standards accepted as RF National standards GOST 7746-2015 Subclause 9.3; Interstate standards accepted as RF National standards GOST 7746-2015 Subclause 9.5; Interstate standards accepted as RF National

standards GOST 8.216-2011 Subclauses 10.2, 10.3.1-10.3.11, 10.3.13.2, 10.13.13.3, 10.3.14; Interstate standards accepted as RF National standards GOST 8.217-2024 Subclause 10.1; Interstate standards accepted as RF National standards GOST 8.217-2024 Subclause 10.2; Interstate standards accepted as RF National standards GOST 8.217-2024 Subclauses 10.3, 10.4, 10.5; Interstate standards accepted as RF National standards GOST 9920-89 (ST SEV 6465-88, IEC 815-86, IEC 694-80) Subclause 2.2; Interstate standards accepted as RF National standards GOST IEC 60898-1-2020 Subclause 9.7.1; Interstate standards accepted as RF National standards GOST IEC 60898-1-2020 Subclause 9.7.2; Interstate standards accepted as RF National standards GOST IEC 61439-1-2013 Subclause 10.5.2; RF National standards GOST R 52034-2023 Subclause 8.1.5: RF National standards GOST R 52034-2023 Subclause 8.2.2: RF National standards GOST R 52034-2023 Subclause 8.7; RF National standards GOST R 52082-2023 Subclause 8.4, Annex G; RF National standards GOST R 52082-2023 Subclause 8.6.5; RF National standards GOST R 52082-2023 Subclause 8.8; RF National standards GOST R 52082-2023 Subclause 8.9.1, Annex B.1; RF National standards GOST R 52082-2023 Subclause 8.9.2; RF National standards GOST R 52082-2023 Subclause 8.9.3; RF National standards GOST R 52082-2023 Subclause 8.9.4; RF National standards GOST R 52082-2023 Subclause 8.9.5; RF National standards GOST R 52082-2023 Subclauses 8.5.1, 8.5.2, 8.5.4-8.5.13; RF National standards GOST R 52719-2007 Subclause 10.1; RF National standards GOST R 52719-2007 Subclause 10.5; RF National standards GOST R 55187-2012 Subclause 9.4; RF National standards GOST R 55195-2012 Subclauses 8.1.4, 8.3.2; RF National standards GOST R 70507.1-2024 Subclause 9.2.4; RF National standards GOST R 70507.1-2024 Subclause 9.2.6; RF National standards GOST R 70507.1-2024 Subclause 9.4; RF National standards GOST R 70507.1-2024 Subclause 9.5; RF National standards GOST R 70507.1-2024 Subclauses 9.2.10, 9.2.11; RF National standards GOST R 70507.2-2024 Subclause 9.15; RF National standards GOST R 70507.2-2024 Subclause 9.16; RF National standards GOST R 70507.2-2024 Subclause 9.17; RF National standards GOST R 70507.2-2024 Subclause 9.18; RF National standards GOST R 70507.2-2024 Subclause 9.5.1; IEC Standards High-voltage switchgear and controlgear - Part 103: Alternating current switches for rated voltages above 1kV up to and including 52 kV IEC 62271-103:2021 ed. 2.0 Subclause 7.101; IEC Standards High-voltage switchgear and controlgear - Part 103: Alternating current switches for rated voltages above 1kV up to and including 52 kV IEC 62271-103:2021 ed. 2.0 Subclause 7.6; IEC Standards Highvoltage switchgear and controlgear - Part 111: Automatic circuit reclosers for alternating current systems up to and including 38 kV IEC 62271-111:2019 ed. 3 Subclause 7.101; IEC Standards High-voltage switchgear and controlgear - Part 111: Automatic circuit reclosers for alternating current systems up to and including 38 kV IEC 62271-111:2019 ed. 3 Subclause 7.102; IEC Standards High-voltage switchgear and controlgear - Part 111: Automatic circuit reclosers for alternating current systems up to and including 38 kV IEC 62271-111:2019 ed. 3 Subclause 7.103; IEC Standards High-voltage switchgear and controlgear - Part 111: Automatic circuit reclosers for alternating current systems up to and including 38 kV IEC 62271-111:2019 ed. 3 Subclause 7.6; IEC Standards High-voltage switchgear and controlgear - Part 37-013: Alternating current generator circuit-breakers IEC/IEEE 62271-37-013:2021 ed. 2.0 Subclause 7.106; IEC Standards IEC 60076-1(2011) Subclause 11.4; IEC Standards IEC 60076-5(2006) clause 4; Power transformers . Short-circuit current withstand GOST R 55188-2012 Subclause 4.2; Power transformers. Short-circuit current withstand GOST R 55188-2012 Subclause 4.1; Metal-enclosed switchgear for rated voltage up to35 kV. General specifications GOST R 55190-2022 Subclause 8.4.8; Metal-enclosed switchgear for rated voltage up to35 kV. General specifications GOST R 55190-2022 Subclause 8.2 (general-purpose balance); Metal-enclosed switchgear for rated voltage up to35 kV. General specifications GOST R 55190-2022 Subclause 8.4.9; Metal-enclosed switchgear for rated voltage up to35 kV. General specifications GOST R 55190-2022 Subclause 8.2 (universal measuring tool); Metal-enclosed switchgear for rated voltage up to35 kV. General specifications GOST R 55190-2022 Subclause 8.4.4.2; Metalenclosed switchgear for rated voltage up to35 kV. General specifications GOST R 55190-2022 Subclause 8.4.5.1; Metal-enclosed switchgear for rated voltage up to35 kV. General specifications GOST R 55190-2022 Subclause 8.2 (visual); Metal-enclosed switchgear for rated voltage up to35 kV. General specifications GOST R 55190-2022 Subclause 8.4.1 (visual inspection); Metal-enclosed switchgear for rated voltage up to35 kV. General specifications GOST R 55190-2022 Subclause 8.4.10; Metal-enclosed switchgear for rated voltage up to35 kV.

General specifications GOST R 55190-2022 Subclause 8.4.2 (universal measuring tool); Metalenclosed switchgear for rated voltage up to35 kV. General specifications GOST R 55190-2022 Subclause 8.4.6.2-8.4.6.4 Name of test object null Switchgear Description of accreditation scope Expansion of accreditation scope PK1RA-139 of March 20, 2025 Confirmation of competence PK1RA-139 of March 20, 2025 Show archive Expansion of accrediation scope PK1RA-139 of March 20, 2025

- <u>W/O CONFIGURATOR</u>
- <u>W/CONFIGURATOR</u>

Testing laboratory Signatures information

111250, Russia, Moscow, Krasnokazarmennaya street, 12, bld. 3.

111250, Russia, Moscow, Krasnokazarmennaya street, 12, bld. 8.

111250, Russia, Moscow, Krasnokazarmennaya street, 12, bld. 7.

Product testing

Note

Electrical switchgear or protective equipment ; Insulating accessories for electrical equipment and ceramic devices; Plastic electrically insulating accessories; Power breakers; AC high-voltage circuit-breakers, contactors and reversers (high-voltage power circuit-breakers); Other technicalpurpose vulcanized rubber products, not elsewhere classified; Wiring products; Electrical insulator; Ceramic electrical insulator; Ceramic electrical insulator; Insulating accessories for electrical equipment and ceramic devices; Electrical switchgear or protective equipment packages; Electrical capacitors; Panels and other electrical switchgear or protective equipment packages for voltages not greater than 1 kV; Other transformers for voltages not greater than 16 kVA; Electrical transformers; Electrical circuit switchgear or protection devices for voltages greater than 1 kV; Sections of electrical switchgear or protection devices for voltages not greater than 1 kV; Sections of electrical switchgear or protection devices for voltages is a protective equipment of the switchgear or protection devices for voltages not greater than 1 kV; Sections of electrical switchgear or protective equipment

HS code (EAEU)

850431 - - not greater than 1 kVA:; 8504320002 - - - - Instrument transformers; 8532 Electrical fixed, variable or tuned capacitors:; 8535 Electrical switchgear or protective equipment for Electrical circuits or connection to them or in Electrical circuit (for example, breakers, switches, circuit-breakers, fuses, lightning conductors, voltage suppressors, voltage jump supressors, current collector, sliding contacts and other connectors, connecting boxes) for voltages greater than 1000 V:; 853590000 - Other:; 8536 Electrical switchgear or protective equipment for Electrical circuits or connection to them or in electrical circuit (for example, breakers, switches, circuit-breakers, relay, fuses, voltage suppressors, two-pin plugs and sockets, lamp holders and other connectors, connecting boxes) for voltages not greater than 1000 V; connectors for optical fibers, fiber-optic bundles and cables:; 8537 Other desk units, panels, consoles, tables, switchboard panels and electrical equipment basis, equipped by two or more devices of product item 8535 or 8536 for electrical current control or distribution, including group 90 instruments or devices and digital control switches, except for switchgear of product item:

Measurement type/method

Environmental effect testing Long-term and accelerated high air humidity testing; Environmental effect testing Elevated operating environmental temperature testing; Environmental effect testing Low-temperature operating environmental temperature testing; Environmental effect testing Hermeticity testing; Environmental effect testing Other environmental effect test methods; Non-destructive testing Exterior inspection and measurements; Non-destructive testing Other non-destructive methods; Other investigation (testing) methods without specification; Thermotechnical temperature measurements; Physical-mechanical measurements of geometrical parameters (length, angle); Physical-mechanical measurements of physical quantities; Functional testing of systems and structural elements; Electrophysical investigation (testing) methods without specification

Calculated rates/measured range

Absolute angle error range passed/failed from -600 to 600 min; Absolute angle error range from -600 to 600 min; Visual inspection range compliant/noncompliant; Water proofness range passed/failed; Exterior range compliant/noncompliant; Overall and connecting dimensions range from 0 to 10000 mm; Geometrical dimensions range from 0 to 1000 mm; Geometrical dimensions range from 0 to 50000 mm; Hermeticity range passed/failed; Vector group range compliant/noncompliant; Capacity range from 20 to 10⁶ pF; Impulse voltage with wave shape of 1,2/50 µs range from 0 to 2250 kV; Test to compatibility of identic withdrawable parts range passed/failed; Test voltage range from 1 to 230 kV; Test current range from 0 to 30000 A; Test current range from 0,5 to 3000 A; Test current range from 0,5 to 30000 A; Test current range from 10 to 100 A; Mass range from 0 to 5000 kg; Mass range from 0,5 to 5000 kg; Mechanical strength range passed/failed; Switching impulse voltage range from 750 to 1600 kV; Power supply voltage range from 0 to 1000 V; Pressure continuity of sliding earthing contacts range passed/failed; Continuity of protective circuit range passed/failed; Relative humidity range from 10 to 98 %; Relative humidity range from 60 to 98 %; Relative current error range passed/failed from -20 to 20 %; Relative current error range from -20 to 20 %; AC voltage range from 0 to 230 kV; AC voltage range from 1 to 950 kV; AC current range from 0 to 12000 A; Voltage transformer (VT) voltage scale transformation coefficient error range passed/failed from -20 to 20 %; Correctness of marking range passed/failed; Correctness of marking range compliant/noncompliant; Temperature rise Calculated rate range; Force range from 0 to 500 N; Force range from 0 to 500 N; Closing time range from 0 to 100 s; Opening time range from 0 to 100 s; Alignment of main and auxiliary circuits detachable contacts range from 0 to 10000 mm; Resistance of the gear main circuit range from 0,000001 to 199,9 Ohm; Resistance of the gear main circuit range from 0,000001 to 1999,9 Ohm; Resistance range from 0 to 10 Ohm; Resistance range from 0,000001 to 199,9 Ohm; Winding insulation resistance range passed/failed from 0 to 40,0 TOhm; Protective circuit resistance range from 10⁻⁶ to 100*10³ Ohm; Protective coating condition range passed/failed; Resistance to upper value of operating temperature range passed/failed; Resistance to frost with its subsequent melting range passed/failed; Resistance to lower value of operating temperature range passed/failed; Resistance to high relative air humidity range passed/failed; Resistance to elevated environmental temperature range passed/failed; Low-temperature resistance range passed/failed; Resistance to temperature change range passed/failed; Dielectrical loss angle tangent range from 0,01 to 100 %; Temperature range from -40 to 100 °C; Temperature range from -40 to 300 °C; Temperature range from -60 to +85 °C; Temperature range from -60 to 85 °C; Temperature range from -75 to 0 °C; Temperature range from 0 to 130 °C; Temperature range from 0 to 300 °C; Temperature range from 0 to 85 °C; Winding temperature Calculated rate range; Ambient temperature range from -40 to 100 °C; Ambient temperature range from 0 to 100 °C; Thermal resistance range passed/failed; Angle error (voltage phase angle error) range passed/failed from -600 to 600 min; Force range from 0 to 500 N; Operation of locking devices range passed/failed; Operation range passed/failed; Operability of fixing devices range passed/failed; Cold-resistance range passed/failed; Electrical capacity range from 20 to 10⁶ pF; Insulation strength range passed/failed; Protective circuit efficiency range passed/failed Procedure

Coupling and power take-off capacitors for power transmission lines. Specifications GOST 15581 Subclause 5.20; Coupling and power take-off capacitors for power transmission lines. Specifications GOST 15581 Subclause 5.21; Coupling and power take-off capacitors for power transmission lines. Specifications GOST 15581 Subclause 5.22; Interstate standards accepted as RF National standards GOST 15581-80 Subclause 5.16; Interstate standards accepted as RF National standards GOST 15581-80 Subclause 5.19; Interstate standards accepted as RF National standards GOST 15581-80 Subclause 5.19; Interstate standards accepted as RF National standards GOST 15581-80 Subclause 5.19; Interstate standards accepted as RF National standards GOST 15581-80 Subclause 5.2; Interstate standards accepted as RF National standards GOST 15581-80 Subclause 5.2; Interstate standards accepted as RF National standards GOST 15581-80 Subclause 5.2; Interstate standards accepted as RF National standards GOST 15581-80 Subclause 5.2; Interstate standards accepted as RF National standards GOST 15581-80 Subclause 5.2; Interstate standards accepted as RF National standards GOST 15581-80 Subclause 5.2; Interstate standards accepted as RF National standards GOST 15581-80 Subclause 5.4, 5.14, 5.15; Interstate standards accepted as RF National standards GOST 15581-80 Subclauses 5.6, 5.9; Interstate standards accepted as RF National standards GOST 15581-80 Subclauses 5.6, 5.9; Interstate standards accepted as RF National standards GOST 15581-80 Subclauses 5.6, 5.9; Interstate standards accepted as RF National standards GOST 1983-2015 Subclause 9.6; Interstate standards accepted as RF National standards GOST 20.57.406-81 Subclauses 1.45, 1.56, 2.16.3; Interstate standards accepted as RF

National standards GOST 20.57.406-81 Subclauses 1.45, 1.56, 2.18; Interstate standards accepted as RF National standards GOST 34839-2022 Subclause 9.5.1; Interstate standards accepted as RF National standards GOST 34839-2022 Subclause 9.5.2; Interstate standards accepted as RF National standards GOST 34839-2022 Subclause 9.5.3; Interstate standards accepted as RF National standards GOST 7746-2015 Subclause 9.3; Interstate standards accepted as RF National standards GOST 7746-2015 Subclause 9.5; Interstate standards accepted as RF National standards GOST 8.216-2011 Subclauses 10.2, 10.3.1-10.3.11, 10.3.13.2, 10.13.13.3, 10.3.14; Interstate standards accepted as RF National standards GOST 8.217-2024 Subclause 10.1; Interstate standards accepted as RF National standards GOST 8.217-2024 Subclause 10.2; Interstate standards accepted as RF National standards GOST 8.217-2024 Subclauses 10.3, 10.4, 10.5; Interstate standards accepted as RF National standards GOST 8024-90 Subclause 2.1; Interstate standards accepted as RF National standards GOST 8024-90 Subclause 2.2; Interstate standards accepted as RF National standards GOST 8024-90 Subclause 2.3; Interstate standards accepted as RF National standards GOST 8024-90 Subclause 2.4; Interstate standards accepted as RF National standards GOST 8024-90 Subclause 2.5; Interstate standards accepted as RF National standards GOST 8024-90 Subclause 2.6; Interstate standards accepted as RF National standards GOST IEC 61439-1-2013 Subclause 10.10; Interstate standards accepted as RF National standards GOST IEC 61439-1-2013 Subclause 10.5.2; RF National standards GOST R 52565-2006 Subclauses 9.10.2.1, 9.10.2.2, 9.10.4; RF National standards GOST R 52565-2006 Subclauses 9.10.2.1, 9.10.2.3, 9.10.5; RF National standards GOST R 55187-2012 Subclause 9.17; RF National standards GOST R 55190-2022 Subclause 8.2.1 (general-purpose balance); RF National standards GOST R 55190-2022 Subclause 8.2.1 (universal measuring tool); RF National standards GOST R 55190-2022 Subclause 8.3.1; RF National standards GOST R 55190-2022 Subclause 8.4.10; RF National standards GOST R 55190-2022 Subclause 8.4.2; RF National standards GOST R 55190-2022 Subclause 8.4.4.2; RF National standards GOST R 55190-2022 Subclause 8.4.5.1; RF National standards GOST R 55190-2022 Subclause 8.4.8; RF National standards GOST R 55190-2022 Subclause 8.4.9; RF National standards GOST R 55190-2022 Subclauses 8.10.4-8.10.6; RF National standards GOST R 55190-2022 Subclauses 8.2.1 (visual); RF National standards GOST R 55190-2022 Subclauses 8.4.6.1, 8.4.6.2, 8.4.6.4-8.4.6.8, 8.4.6.10; IEC Standards High-voltage switchgear and controlgear - Part 1: General specifications for alternating current switchgear and controlgear IEC 62271-1:2017 ed. 2.1 Subclause 7.5; IEC Standards High-voltage switchgear and controlgear - Part 37-013: Alternating current generator circuit-breakers IEC/IEEE 62271-37-013:2021 Subclause 7.5 Name of test object

null Power circuit-breakers

Description of accreditation scope Expansion of accreditation scope PK1RA-139 of March 20, 2025 Confirmation of competence PK1RA-139 of March 20, 2025 Show archive Expansion of accrediation scope PK1RA-139 of March 20, 2025

- <u>W/O CONFIGURATOR</u>
- W/CONFIGURATOR

Testing laboratory Signatures information

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Note

Electrical switchgear or protective equipment ; Plastic Electricly insulating accessories; AC high-voltage circuit-breakers, contactors and reversers (high-voltage power circuit-breakers); Other vulcanized rubber products, not elsewhere classified; hard rubber in all forms and products thereof; porous vulcanized rubber flooring and matting; Wiring products; Electrical insulators; Ceramic electrical insulators; insulating accessories for electrical equipment and ceramic devices; Electrical insulators; Insulating accessories for electrical machines and equipment; Electrical pipes; Single-end service assembled chambers; Switchgear; Sulphur hexafluoride-insulated switchgear; Electrical switchgear or protective equipment packages; Other electrical equipment; Other electronic and electrical leads and cables; Other electrical conductors for voltages greater than 1 kV; Other electrical conductors for voltages not greater than 1 kV; AC high-voltage disconnecting switches, short-circuiting switches, isolating switches, earthing switches; Voltage transformers; Other transformers not greater than 16 kVA; Power transformers; Current transformers; Electrical transformers; Electrical circuit switchgear or protection devices for voltages greater than 1 kV; Electrical circuit switchgear or protection devices for voltages not greater than 1 kV; Sections of electrical switchgear or protective equipment; Electromotors, generators and transformers

HS code (EAEU)

8504 Electrical transformers, static electrical conventors (for example, rectifiers), Inductance coils and throttles:; 8504210000 - - not greater than 650 kVA; 8504221000 - - - greater than 650 kVA, but not greater than 1 600 kVA; 8504229000 - - - greater than 1 600 kVA, but not greater than10 000 kVA; 850423000 - - greater than 10 000 kVA:; 850431 - - not greater than 1 kVA:; 850431800 - - - Other:; 850432000 - - greater than 1 kVA, but not greater than 16 kVA:; 8504320002 - - - - Instrument transformers; 850433000 - - greater than 16 kVA, but not greater than 500 kVA:; 8504340000 - - greater than 500 kVA; 850450 - Other inductance coils and throttles :; 8535 Electrical switchgear or protective equipment for electrical circuits or connection to them or in electrical circuit (for example, breakers, switches, circuit-breakers, fuses, lightning conductors, voltage suppressors, voltage jump supressors, current collector, sliding contacts and other connectors, connecting boxes) for voltages greater than 1000 V:; 853590000 - Other:; 8535900001 - - wall tubes with one or several electrodes voltages not less than 110 kV, but not greater than 550 kV in a housing made of aluminum alloy, containing a mounting flange ring for connecting external equipment with mounting holes, the centres of which are located on a circle with a diameter of at least 330 mm, but not greater than 680 mm; 8535900008 - - Other; 8536 Electrical switchgear or protective equipment for electrical circuits or connection to them or in electrical circuit (for example, breakers, switches, circuit-breakers, fuses, lightning conductors, voltage suppressors, voltage jump supressors, current collector, sliding contacts and other connectors, connecting boxes) for voltages not greater than 1000 V; connectors for optical fibers, fiber-optic bundles and cables:; 8537 Other desk units, panels, consoles, tables, switchboard panels and electrical equipment basis, equipped by two or more

devices of product item 8535 or 8536 for electrical current control or distribution, including group 90 instruments or devices and digital control switches, except for switchgear of product item 8517:; 853720 - for voltages greater than 1000 V:; 854442 - - fitted by connecting accessories:; 854449 - - other:; 854460 – Electrical conductors for voltages greater than 1000 V Other:; 8546 Electrical insulators made of any materials:; 8546200000 - ceramic; 8546901000 - - plastic

Measurement type/method

Environmental effect testing Hermiticity testing; Environmental effect testing Other environmental effect test methods; Non-destructive testing Visual method; Non-destructive testing Exterior inspection and measurements; Physical-mechanical measurements of physical quantities; Other physical and mechanical investigation (testing) methods to determine physical and mechanical parameters Other physical and mechanical investigation (testing) methods to determine physical and mechanical parameters; Functional testing of systems and structural elements; Electrophysical investigation (testing) methods without specification Calculated rates/measured range

Absolute angle error range from -600 to 600 min; Protective coating adhesion range passed/failed; Active power Calculated rate range from 0 to 2000 kVT; Active power range from 0 to 2000 kVT; Interchangeability of parts range compliant/noncompliant; Compatibility of identic withdrawable parts range passed/failed; Visual inspection isual inspection range compliant/noncompliant; Exterior (description) range compliant/noncompliant; Exterior range compliant/noncompliant; Time range from 1 to 60 s; Geometrical dimensions range passed/failed from 0 to 20000 mm; Geometrical dimensions range passed/failed from 0 to 50000 mm; Geometrical dimensions range from 0 to 1000 mm; Geometrical dimensions range from 0 to 15000 mm; Geometrical dimensions range from 0 to 50000 mm; Hermeticity range passed/failed; Vector group Calculated rate range from 0 to 1100 kV from 0 to 360 degrees; Vector group range compliant/noncompliant; Power core diameter range from 0,1 to 1000 mm; Water diffusion range passed/failed; Length range from 1 to 100 m; Leakage path length range passed/failed from 0 to 50000 mm; Leakage path length for external insulation range from 0 to 50000 mm; Inductive resistance Calculated rate range; Test force range from 0 to 500 N; Test pressure range from 0 to 5 bar; Test lightning impulse voltage range from 0 to 20 kV; Test lightning impulse voltage range from 0 to 2250 kV; Test lightning impulse voltage range from 3 to 2250 kV; Test voltage range from 0 to 50 kV; Power supply test voltage range from 0 to 1000 V; One-minute AC test voltage range from 0 to 10 kV; One-minute AC test voltage range from 1 to 950 kV; Test control voltage range from 0 to 1000 V; Test current range from 0 to 6000 A; Test current range from 10 to 100 A; Corrosion-protective coating quality range passed/failed; External corrosion-protective coating quality range passed/failed; Quality of protective enclosure surface range passed/failed; Quality of connection between accessories and insulation part range passed/failed from 0 to 10000 mm; Water repellence class range from 1 to 7 null; Number of cycles range from 1 to 100000 cycles; Switching wear-resistance range passed/failed; Completeness range compliant/noncompliant; Structure range compliant/noncompliant; Protective enclosure structure range passed/failed; Gas concentration range from 0 to 1000 mln⁻¹; Absorption coefficient Calculated rate range; Coupling coefficient Calculated rate range; Transformation ratio Calculated rate range; Transformation ratio range from 0,1 to 9999 rel. unit; Steepness (rate of voltage rise) Calculated rate range from 500 to 2500 kV/µs; Marking range compliant/noncompliant; Marking and branding range confirmed/not confirmed; Marking and branding range compliant/noncompliant; Mass range passed/failed from 0 to 5000 kg; Mass range passed/failed from 0.5 to 5000 kg null; Mass range from 0 to 50 kg; Mass range from 0 to 5000 kg; Mass range compliant/noncompliant from 0 to 5000 kg; Mechanical wear-resistance range passed/failed; Mechanical strength of switchgear structural elements in multiple operations range passed/failed; Heating of equipment elements range passed/failed; Lightning impulse voltage range from 0 to 2250 kV; Short-circuit voltage Calculated rate range; Short-circuit voltage in percent range; Short-circuit voltage range from 0 to 100 kV; Exciting voltage range from 0 to 2000 V; Power supply voltage range from 0 to 1000 V; Current voltage range from 1 to 70 kV; Power-frequency voltage range from 1 to 500 kV; Power-frequency voltage range from 1 to 950 kV; Actuating voltage range from 0 to 500 V; Outer diameter of insulated core range from 0,1 to 1000 mm; Pressure continuity of sliding earthing contacts range passed/failed; Continuity of protective circuit range passed/failed; Protected against steep impulse voltage breakdown range passed/failed; Identification and marking range compliant/noncompliant; Vertical axis deviation (verticality) range from 0 to 10 mm; Relative current error range from -20 to 20 %; Voltage drop range from 0 to 1000 V; Flange face surfaces parallelism range passed/failed from 0 to 10 mm; AC voltage range from 0 to 100 kV; AC voltagerange from 0 to 1100 kV; AC voltage range from 0 to 347 kV; AC voltage range from 10 to 80 kV; AC current range from 0 to 25 kA; AC current range from 0 to 6000 A; Voltage transformer (VT) voltage scale transformation coefficient error range passed/failed from -20 to 20 %; Integrity and correctness of marking range passed/failed; DC current range from 0 to 100 A; Short-circuit losses Calculated rate range; Short-circuit losses range from 0 to 2 MW; Short-circuit losses reduced to design temperature range; No-load losses Calculated rate range; Consumed power range from 0 to 100 kVT; Correctness of marking range compliant/noncompliant; Temperature rise Calculated rate range; Predischarge time of impulse range from 0,5 to 6 µs; Breakdown voltage at frequency 50 Hz range from 0 to 500 kV; Verification of nameplate data compliance to the specified requirements range compliant/noncompliant; Mark permanency range negative/positive; Dimensions range from 0 to 50000 mm; Dimensions range compliant/noncompliant from 0 to 1000 mm; Dimensions range compliant/noncompliant from 0 to 50000 mm; Force range from 0 to 500 N; Gas leakage rate Calculated rate range; Closing time range from 0 to 100 c; Opening time range from 0 to 100 s; Alignment of main and auxiliary circuits detachable contacts range from 0 to 1000 mm; Main circuit insulation resistance range passed/failed from 0 to 40,0 TOhm; Insulation resistance range sufficient/insufficient from 0 to 40,0 TOhm; Insulation resistance range from 0 to 40,0 TOhm; Insulation resistance range satisfactory/unsatisfactory from 0 to 40 TOhm; Winding insulation resistance range passed/failed from 0 to 40 TOhm; Winding insulation resistance range passed/failed from 0 to 40 TOhm; Winding insulation resistance range passed/failed from 0 to 40,0 TOhm; Winding insulation resistance range from 0 to 40,0 TOhm; DC winding resistance range from 10⁻⁶ to 100*10³ Ohm; DC winding resistance range passed/failed from 10⁻⁶ to 199,9 Ohm; Protective circuit resistance range from 10⁻⁶ to 100*10³ Ohm; Protective coating condition range compliant/noncompliant; Surface condition range compliant/noncompliant; Actuating range passed/failed; DiElectrical loss angle tangent range from 0,01 to 100 %; Ambient temperature range from 0 to 300 °C; Temperature range from 0 to 300 °C; Circuital current range from 0,1*10⁻³ to 600 A; Exciting current range from 0 to 100 A; Actuating current range from 0 to 30 A; No-load current Calculated rate range; Protective coating thickness range passed/failed from 5 to 3000 µm; Tracking-erosion resistance range passed/failed; Angle error (voltage phase angle error) range passed/failed from -600 to 600 min; Angle error (voltage phase angle error) range compliant/noncompliant; Specific resistance Calculated rate range; Radio interference level range passed/failed from 10 to 100 dB; Partial discharge range passed/failed from 1 to 10000 sr; Partial discharge range passed/failed from 1 to 100000 sr; Partial discharge range satisfactory/unsatisfactory from 1 to 10000 sr; Force range from 0 to 500 N; Tearing force range from 0 to 2 kN; Shear force range from 0 to 2 kN; Installation of accessory equipment and the way of its fixing range compliant/noncompliant; Locking devices range passed/failed; Fixing devices range passed/failed; Operation range passed/failed; Flange face surfaces eccentricity Calculated rate range passed/failed; Electrical capacity range from 20 to 1*10⁶ pF; Insulation strength range passed/failed; Electrical resistance range from 10⁻⁶ to 100*10³ Ohm; Electrical insulation resistance range passed/failed from 0 to 40 TOhm; Electrical insulation resistance range from 0 to 40,0 TOhm; DC Electrical resistance range from 10⁻⁶ to 10⁵ Ohm; Electrical resistance of power core range from 10⁻⁶ to 10*10³ Ohm; Correctness of marking and branding and other technical documentation requirements that can be checked visually range compliant/noncompliant; Protective coating condition and insulation part surfaces range compliant/noncompliant

Procedure

Outdoor polymer post insulators for voltages 3–750 kV. General specifications GOST R 52082-2023 Subclause 8.9.7; Instruction High-voltage AC bridge MEP-5SA. Operation manual 4221-001-75617971-2007 RE clause 4; Interstate standards accepted as RF National standards GOST 14794-79 Subclause 6.1; Interstate standards accepted as RF National standards GOST 14794-79 Subclause 6.10; Interstate standards accepted as RF National standards GOST 14794-79 Subclause 6.2; Interstate standards accepted as RF National standards GOST 14794-79 Subclause 6.2; Interstate standards accepted as RF National standards GOST 14794-79 Subclause 6.7; Interstate standards accepted as RF National standards GOST 14794-79

Subclause 6.8; Interstate standards accepted as RF National standards GOST 1983-2015 Subclause 9.3; Interstate standards accepted as RF National standards GOST 1983-2015 Subclause 9.6; Interstate standards accepted as RF National standards GOST 20248-82 Clause 9; Interstate standards accepted as RF National standards GOST 20493-2001 Subclause 8.8; Interstate standards accepted as RF National standards GOST 22756-77 Subclause 3.1; Interstate standards accepted as RF National standards GOST 28114-89 Subclauses 3-5; Interstate standards accepted as RF National standards GOST 2933-93 Subclause 2.12; Interstate standards accepted as RF National standards GOST 2933-93 Subclause 3.12; Interstate standards accepted as RF National standards GOST 2933-93 Subclause 5; Interstate standards accepted as RF National standards GOST 2933-93 Subclauses 2.1-2.7; Interstate standards accepted as RF National standards GOST 2933-93 Subclauses 3.1-3.11; Interstate standards accepted as RF National standards GOST 2933-93 Subclauses 8.1 - 8.4; Interstate standards accepted as RF National standards GOST 2990-78 Subclauses 4.1, 4.4.1; Interstate standards accepted as RF National standards GOST 31996-2012 Subclauses 8.3.1; Interstate standards accepted as RF National standards GOST 31996-2012 Subclauses 8.3.2, 8.3.3; Interstate standards accepted as RF National standards GOST 3345-76 Clauseы 2, 3, 4; Interstate standards accepted as RF National standards GOST 34839-2022 Subclause 9.2.1; Interstate standards accepted as RF National standards GOST 34839-2022 Subclause 9.2.2; Interstate standards accepted as RF National standards GOST 34839-2022 Subclause 9.2.4; Interstate standards accepted as RF National standards GOST 34839-2022 Subclauses 9.1.2, 9.2.3, 9.2.5; Interstate standards accepted as RF National standards GOST 3484.1-88 Subclauses 5.1, 5.2; Interstate standards accepted as RF National standards GOST 3484.1-88 Clause 2; Interstate standards accepted as RF National standards GOST 3484.1-88 Clause 6; Interstate standards accepted as RF National standards GOST 3484.3-88 Subclauses 4.1, 5.1; Interstate standards accepted as RF National standards GOST 7746-2015 Subclause 9.3; Interstate standards accepted as RF National standards GOST 7746-2015 Subclause 9.5; Interstate standards accepted as RF National standards GOST 8.216-2011 Subclauses 10.2, 10.3.1-10.3.11, 10.3.13.2, 10.13.13.3, 10.3.14; Interstate standards accepted as RF National standards GOST 8.217-2024 Subclause 10.1; Interstate standards accepted as RF National standards GOST 8.217-2024 Subclause 10.2; Interstate standards accepted as RF National standards GOST 8.217-2024 Subclauses 10.3, 10.4; Interstate standards accepted as RF National standards GOST 8.217-2024 Subclauses 10.3, 10.4, 10.5; Interstate standards accepted as RF National standards GOST 9920-89 (ST SEV 6465-88, IEC 815-86, IEC 694-80) Subclause 2.2; Interstate standards accepted as RF National standards GOST IEC 60898-1-2020 Subclause 9.7.2; Interstate standards accepted as RF National standards GOST IEC 61439-1-2013 Subclause 10.5.2; RF National standards GOST R 52034-2023 Subclause 8.1.2; RF National standards GOST R 52034-2023 Subclause 8.7.4; RF National standards GOST R 52034-2023 Subclauses 8.7.1, 8.7.4; RF National standards GOST R 52034-2023 Subclauses 8.7.2, 8.7.4; RF National standards GOST R 52034-2023 Subclauses 8.7.3, 8.7.4; RF National standards GOST R 52082-2023 Subclause 8.1.12; RF National standards GOST R 52082-2023 Subclause 8.2.1-8.2.4, 8.2.6-8.2.9; RF National standards GOST R 52082-2023 Subclause 8.3; RF National standards GOST R 52082-2023 Subclause 8.9.1, Annex B.1; RF National standards GOST R 52082-2023 Subclause 8.9.2; RF National standards GOST R 52082-2023 Subclause 8.9.3; RF National standards GOST R 52082-2023 Subclause 8.9.4; RF National standards GOST R 52082-2023 Subclause 8.9.5; RF National standards GOST R 52082-2023 Subclauses 8.1.1, 8.1.7; RF National standards GOST R 52082-2023 Subclauses 8.1.1, 8.1.2, 8.1.3, 8.1.4, 8.1.5; RF National standards GOST R 52082-2023 Subclauses 8.1.11; RF National standards GOST R 52082-2023 Subclauses 8.8.1, 8.8.5; RF National standards GOST R 52082-2023 Subclauses 8.8.2, 8.8.5; RF National standards GOST R 52082-2023 Subclauses 8.8.3, 8.8.5; RF National standards GOST R 52082-2023 Subclauses 8.8.4, 8.8.5; RF National standards GOST R 52719-2007 Subclause 10.1; RF National standards GOST R 55187-2012 Subclause 9.16; RF National standards GOST R 55187-2012 Subclause 9.2; RF National standards GOST R 55187-2012 Subclause 9.4; RF National standards GOST R 55190-2022 Subclause 8.4.1; RF National standards GOST R 55190-2022 Subclause 8.4.10.1, 8.4.10.3, 8.4.10.4; RF National standards GOST R 55190-2022 Subclause 8.4.10.2; RF National standards GOST R 55190-2022 Subclause 8.4.4.2; RF National standards GOST R 55190-2022 Subclause 8.4.5.1; RF National standards GOST R 55190-2022 Subclause 8.4.9; RF National standards GOST R 55195-2012 Subclauses 8.1.4, 8.3.2; RF National standards GOST R 55716-2013

Subclause 6.5; RF National standards GOST R 70507.1-2024 Subclause 9.1; RF National standards GOST R 70507.1-2024 Subclause 9.2.4; RF National standards GOST R 70507.1-2024 Subclause 9.2.6; RF National standards GOST R 70507.1-2024 Subclause 9.3; RF National standards GOST R 70507.1-2024 Subclause 9.4; RF National standards GOST R 70507.1-2024 Subclause 9.5; RF National standards GOST R 70507.1-2024 Subclauses 9.2.10, 9.2.11; RF National standards GOST R 70507.2-2024 Subclause 9.15; RF National standards GOST R 70507.2-2024 Subclause 9.5.1; RF National standards GOST R IEC 60230-2022 Subclauses 6, 10; IEC Standards IEC 60076-1(2011) Subclause 11.3; IEC Standards IEC 60076-1(2011) Subclause 11.4; IEC Standards IEC 60076-1(2011) Subclause 11.5; IEC Standards IEC 60137(2008) ed 6.0 Subclause 9.9: IEC Standards IEC 60137(2008) ed 6.0 Subclauses 8.10, 9.7: Instrument transformers. Part 2. Specifications on current transformers GOST R 70507.2-2024 Subclause 9.17; Power transformers . Electromagnetic test methods GOST 3484.1-88 Subclause 5.3 (calculation); Metal-enclosed switchgearfor rated voltage up to35 kV. General specifications GOST R 55190-2022 Subclause 8.4.1; Metal-enclosed switchgear for rated voltage up to35 kV. General specifications GOST R 55190-2022 Subclause 8.4.2; Metal-enclosed switchgear for rated voltage up to 35 kV. General specifications GOST R 55190-2022 Subclause 8.4.8; Metalenclosed switchgearfor rated voltage up to35 kV. General specifications GOST R 55190-2022 Subclauses 8.10.4 – 8.10.6; Metal-enclosed switchgearfor rated voltage up to35 kV. General specifications GOST R 55190-2022 Subclauses 8.2.1, 8.2.2; Metal-enclosed switchgearfor rated voltage up to35 kV. General specifications GOST R 55190-2022 Subclauses 8.4.6.1, 8.4.6.2, 8.4.6.4 - 8.4.6.8, 8.4.6.10

Name of test object

null Single-end service assembled chambers; null Switchgear; null sulphur hexafluorideinsulated switchgears; null Voltage transformers; null Power transformers; null Current transformers Accreditation scope Expansion of accreditation scope PK1RA-139 of March 20, 2025 Confirmation of competence PK1RA-139 of March 20, 2025 Show archive Confirmation of competence PK1RA-139 of March 20, 2025

- WITHOUT CONFIGURATOR
- W/CONFIGURATOR

Testing laboratory Signatures information

111250, RUSSIA, Moscow, Krasnokazarmennaya street, 12, bld. 3 111250, RUSSIA, Moscow, Krasnokazarmennaya street, 12, bld. 8. 111250, RUSSIA, Moscow, Krasnokazarmennaya street, 12, bld. 7. Product testing

Note

Electrical batteries and their sections; Antennas and antenna reflectors of all types and their sections; Sections of radio or television transmitting equipment, TV cameras; Equipment for recording and reproducing sound and images; Switchgear, radio or television transmitting equipment, TV cameras; Radar, radio navigation and remote control equipment; Electrical switchgear or protective equipment; Electrical switchgear or protective equipment; Other electrical equipment for control of electrical units, not elsewhere classified; Electrical equipment for control of electrical units, except for contactors and electromagnetic starters, control and protection relays; Accessories (taps, valves and other similar accessories) for pipelines, vessels, boilers, tank cisterns, reservoirs and similar containers; Insulating accessories for electrical machines and equipment; Cable accessories; Cable accessories; Pipeline accessories (accessories) (taps, valves and others); Plastic electrically insulating accessories; Batteries and accumulators; Units, sections and accessories of computing machines; Ferous metal drums and similar containers; Precise scales; Tools for drawing, calculations, devices for measuring linear dimensions etc.; Distilled water; Power breakers; Power breakers; AC high-voltage circuitbreakers, contactors and reversers (high-voltage power circuit-breakers); AC high-voltage circuit-breakers, contactors and reversers (high-voltage power circuit-breakers); Parts and nodes accessories (taps, valves and others); Diods and transistors; Assembled metal buildings; Other vulcanized rubber products, not elsewhere classified; hard rubber in all forms and products thereof; porous vulcanized rubber flooring and matting; Other vulcanized rubber products, not elsewhere classified; hard rubber in all forms and products thereof; porous vulcanized rubber flooring and matting; Other metal products; Wiring products; Insulators for railway overhead; Electrical insulators; Electrical insulators; Electrical ceramic insulators; Insulating accessories for Electrical equipment and ceramic devices; Electrical glass insulators; Electrical insulators; Insulating accessories for Electrical machines and equipment; Other instruments for measurement, control and testing; Electrical tools for soft and hard soldering and welding, machines and devices for surface heat treatment and thermal spraying; Fiber-optic cables; Highvoltage cables for earthmoving, mining and other mobile machines and mechanisms; Power cables for fixed gasket for voltages greater than 1 kV; Power cables with aluminum conductor for voltages greater than 1 kV; Power cables with copper conductor for voltages greater than 1 kV; Power cables with plastic and paper insulation for fixed installation for voltages greater than 1 kV (to 35 kV inclusively); Single-end service assembled chambers; Cards with built-in integrated circuits (smart-cards); Control buttons, control posts, stations, apparatus; Element commutators, controllers, drum switches, manual starters, miscellaneous switches; Switchgears; sulphur hexafluoride-insulated switchgears; Complete transformer substations; Other componenets and accessories for motor vehicles; Componenets and accessories for motor vehicles, not elsewhere classified; Ignition system wiring packages and other wiring packages used in land, air and water transport; Electrical switchgear or protective equipment packages; Electrical switchgear or protective equipment packages; Electronic components; Computers and

peripheral equipment; Computers, their sections and asseccories; Capacitors and capacitor units; Variable or adjustable capacitors (presettable); Fixed capacitors for 50/60 Hz circuits with reactive power of at 0,5 kW; Other fixed capacitors; Electrical capacitors; Electromagnetic contactors; Vaccum or gas-filled electronic tubes and lamps with a hot cathode, cold cathode or cathode ray tube, including cathode ray tubes; Incandescent or gas-discharge lamps; arc lamps; LED lamps; Electrical insulating oils; Other finished metal products, not elsewhere classified; Metal products for bathroom and kitchens; Construction metal structures and their sections; Microphones, talkies, receiving equipment for radiotelephones or radiotelegraph communication; Electromagnetic couplings, electromagnets, electromagnetic cutting, ODA coils, blocks, locks, electromagnetic keys; Other pumps and compressors; Magnetic and optical data carriers; non-Electrical equipment for cooking and heating food; Hydraulic and pneumatic power equipment; Equipment for measuring, testing and navigation; Communacation equipment; Terminal (user) equipment for telephone or telegraph communacation, video communication equipment; Electrical and electronic equipment for vehicles; Electrical lighting equipment; Other Electrical equipment; Other Electrical equipment; other Electrical equipment for motor vehicles and their sections; Other Electrical equipment and their sections; Other Electrical equipment, not elsewhere classified(including electromagnets; electromagnetic clutches and brakes; electromagnetic lifting grips; Electrical accelerators; Electrical signal generators); Arms and armaments; Arms and armaments and their sections; Panels and other Electrical switchgear or protective equipment packages for voltages greater than 1 kV; Panels and other Electrical switchgear or protective equipment packages for voltages not greater than 1 kV; Liquid crystal or light-emetting diode indicators; Electrical equipment for sound or light alarm; Sound boards, video boards, network and similar boards for automatic data processing machines; Mounted printed circuit boards; Other bearings, gears, gear transmissions and drive elements; Ball or roller bearings; Bearings, gears, gear transmissions and drive elements; High-voltage fuses; Nonelectrical appliances; Appliances; Other appliances not elsewhere classified; Instruments for measuring electrical quantaties or ionizing radiation; Instruments for monitoring other physical quantaties; Navigational, meteorogical, theophysical and similar instruments; Television receivers, whether or not combined with broadcast radio receivers or apparatus for recording or reproducing sound or images; Game consoles used with a television receiver or equipped by a built-in screen, and other commercial and gambling games with an electronic display; Wires for overhead transmission line; Wires and cables for rolling stock of transport for voltages greater than 1 kV: Other electronic and electrical wires and cables: Other electronic and electrical wires and cables; Other electrical conductors for voltages greater than 1 kV not elsewhere classified; Other electrical conductors for voltages greater than 1 kV; Other electrical conductors for voltages not greater than 1 kV; Electromagnetic actuators; Broadcast radio receivers; Highvoltage discharge devices; Discharge devices, overvoltage suppressors; Disconnecting switches and earthing switches, insulating switches and short-circuiting switches; AC high-voltage disconnecting switches, short-circuiting switches, insulating switches, earthing switches (AC disconnecting and earthing switches for voltages greater than1 kV, test power-frequency 50 Hz, and actuators for them); Plug connectors and sockets; Plug connectors, sockets and other Electrical circuit switchgear or protection devices, not elsewhere classified; Reservoirs, tank cisterns and other similar metal containers; Resistors, except for heat resistors; Seat belts, airbags, their sections and body accessories; Ligthning fixtures and lightning devices; Other lighning fixtures and lightning devices; Seats for motor vehicles; Electrical connectors, contact clamps, clamp sets; Electrical connectors, contact clamps, clamp sets; Motor vehicles; Integrated electronic circuits; lightweight metal container; Thermostats, pressure stabilizers and other devices and equipment for automatic adjustment and control; Appliances; Voltage transformers; Other transformers for voltage greater than 16 kVA; Other transformers for voltage not greater than 16 kVA; Liquid filled transformers; Power transformers; Current transformers; Electrical transformers; Electrical transformers (general-purpose dry transformer, including autotransformers; auxiliary station transformers; and transformers for packaged transformer substations (PTS) for voltage classes through to 35 kV); Electrical insulating pipes; Magnetic amplifiers and controlled throttles; Electrical generator units and rotary conventers; Other automatic data processing devices; Electrical circuit switchgear or protection devices for voltages greater than 1 kV; Electrical circuit switchgear or protection devices for voltages greater than 1 kV; Storage devices and other data storage devices; Electrical circuit switchgear or protection devices for voltages not greater than 1 kV; Electrical circuit switchgear or protection devices for voltages not greater than 1 kV; Other electrical circuit switchgear or protection devices not elsewhere classified; Security or fire alarm devices and similar equipment; Electrical signalling devices, Electrical equipment for providing safety or traffic control on railways, tramways, roads, inland waterways, parking areas, port facilities or airfields; Refrigerators and freezers; washing machines; Electrical pads; fans; Sections of appliances; Sections of hydraulic and pneumatic power equipment; Sections of sound and video equioment; Sections and accessories of switchgear equipment; Sections and accessories of measuring, testing and navigation equipment; Sections of lamps and lightning equipment; Sections of ovens, stoves, plate warmers and similar non-electrical appliances; Sections of bearings, gears and drive elements; Sections of other electrical equipment for motor vehicles and motorcyles; Sections of resistors, rheostats and potentiometers; Sections of security or fire alarm devices and similar equipment; Sections of electrical capacitors; Sections of electrical capacitors, electrical resistors, rheostats and potentiometers; Sections of electrical switchgear or regulating equipment; Sections of electromotors, generators and transformers; Sections of electronic lamp and pipes, and other electronic accessories not elsewhere classified; Electromotors for power not greater than 37,5 W; other DC electromotors; DC generators; Multipurpose AC and DC electromotors for power greater than 37,5 W; other AC electromotors; AC generators (synchronous generator); Electromotors, generators and transformers; Electromotors, generators and transformers; Ballast elements for gas discharge lamps or tubes; static electrical conventers; other inductor coils; Magnetic semiconductor logic elements; Primary cells and primary cell batteries and their sections

HS code (EAEU)

2710 Oil and petroleum products obtained from bituminous rocks except for crude; products, not elsewhere specified or included, containing 70 mass% of petroleum or petroleum products or more obtained from bituminous rocks, these petroleum products being the main constituents of the products; used petroleum products; 8501 Electrical motors and generators (except for electrical generator unit):; 8504 Electrical transformers, static electrical conventors (for example, rectifiers), inductors and throttles; 8504210000 - - not greater than 650 kVA; 850422 - - greater than 650 kVA, but not greater than 10 000 kVA:; 8504221000 - - - greater than 650 kVA, but not greater than 1600 kVA; 8504229000 - - - greater than 1600 kVA, but not greater than10000 kVA; 850423000 - - greater than 10000 kVA:; 850431 - - not greater than 1 kVA:; 850431800 -- - other; 850432000 - - greater than 1 kVA, but not greater than 16 kVA:; 8504320001 --- for civial aircrafts; 8504320002 - - - - Instrument transformers; 850433000 - - greater than 16 kVA, but not greater than 500 kVA:; 8504340000 - - greater than 500 kVA; 850450 - other inductors and throttles:; 850590 - others, including Sections:; 8532 Electrical fixed variable or tuned capacitors:; 8535 Electrical switchgear or protective equipment for electrical circuits or connection to them or in electrical circuit (for example, breakers, switches, circuit-breakers, fuses, lightning conductors, voltage suppressors, voltage jump supressors, current collector, sliding contacts and other connectors, connecting boxes) for voltages greater than 1000 V:; 853530 - disconnecting switches and breakers:; 853590000 - others:; 8535900008 - - others; 8536 Electrical switchgear or protective equipment for electrical circuits or connection to them or in electrical circuit (for example, breakers, switches, circuit-breakers, relay, fuses, voltage suppressors, two-pin plugs and sockets, lamp holders and other connectors, connecting boxes) for voltages not greater than 1000 V; connectors for optical fibers, fiber-optic bundles and cables:; 853610 - fuses:; 853620 - automatic switches:; 853630 - other electrical circuit protection devices:; 853650 - other switches:; 853670000 - connectors for optical fibers, fiberoptic bundles and cables:; 853690 - other devices:; 8537 Other remote controls, panels, consoles, tables, distribution boards and bases for electrical equipment fitted with two or more devices with items 8535 or 8536 for current control or distribution, including instruents or devices of group 90 and digital control apparatus, except for switchgears with item 8517:; 853720 - for voltages greater than 1000 V:; 854460 – other electrical conductors for voltages greater than 1000 V:; 8546 Electrical insulators made of any materials:; 8546100000 - glass; 8546200000 - ceramic; 8546901000 - - plastic; 8547900000 - other Measurement type/method

Environmental effect testing Temperature change testing; Environmental effect testing Single mechanical shocks testing; Environmental effect testing Cleaning solvent exposure testing;

Environmental effect testing Elevated operating environmental temperature testing; Environmental effect testing Other environmental effect test methods; Safety testing. Fire safety and explosion safety; Other fire and explosion safety test methods; Reliability and service-life testing Other reiability and service-life test methods; Non-destructive testing Exterior inspection and measurements; Non-destructive testing Non-destructive testing by penetrating agents. Leak detection, mass-spectrometry; Non-destructive testing Other non-destructive methods; Other investigation (testing) methods without specification; Thermotechnical testing Temparature measurement; Physical-mechanical measurement of geometrical parameters (length, angle); Physical-mechanical measurement of physical quantities; Physical-mechanical measurement of mechanical quantities; Other physical and mechanical investigation (testing) methods to determine physical and mechanical parameters; Electrophysical investigation (testing) methods without specification

Calculated rates/measured range

Absolute angle error range from -600 to +600 min; Protective coating adhesion range passed/failed; Frequency response amplitude/attenuation factor range from -130 to 0 dB; Compatibility of replacement identic component Sections range operated/not operated; Explosion safety range passed/failed; Vibratory displacement range from 0 to 6 mm; Moisture resistance range passed/failed; Water proofness range passed/failed; Water proofness range passed/failed from 0 to 98 %; Humidity range from 0 to 98 %; Humidity range from 25 to 100 %; Humidity range from 60 to 98 %; Exterior range compliant/noncompliant; Water absorption range passed/failed; Air gaps range from 0 to 8000 mm; Time range from 0 to 1000 s; Time range from 0 to 5 min; Time range from 0 to 50 h; Time range from 0 to 500 h; Time range from 0 to 60 min; Time range from 0 to 60 s; Time range from 0 to 86399 s; Time range from 0 to 86 399 s; Time range from 0,001 to 5,2 s; Time range from $0,2*10^{-3}$ to 5,2 s; Time range from 1 to 60 s; Dye rising time range from 0 to 60 min; Opening time/time interval range from 0,0001 to 1000 s; Withstand cantilever load range from 0 to 10 kN; Power-frequency withstand voltage range from 0 to 10 kV; Power-frequency withstand voltage range from 0 to 230 kV; Height range from 0 to 15 m; Overall dimensions/setting dimensions/connecting dimensions range compliant/noncompliant from 0 to 15000 mm; Overall, setting and connecting dimensions range from 0 to 10000 mm; Geometrical dimensions range from 0 to 10000 mm; Geometrical dimensions range from 0 to 15000 mm; Geometrical dimensions range from 0 to 8000 mm; Geometrical dimensions range compliant/noncompliant from 0 to 10000 mm; Geometrical dimensions range compliant/noncompliant from 0 to 15000 mm; Hermeticity range passed/failed; Water repellence range from 1 to 7 class; Ready gas leak Calculated rate range; Ready gas leak Calculated rate range passed/failed; Vector group range compliant/noncompliant; Pressure range from 0 to 0,9 MPa; Actuating pressure range from 0 to 0,9 MPa; Diameter range from 0 to 8000 mm; Water diffusion into an insulating body range passed/failed; Length range from 0 to 50 m; Length range from 0 to 8000 mm; Leakage path length range passed/failed; Leakage path length range passed/failed from 0 to 15000 mm; Leakage path length range from 0 to 15000 mm; Test length range from 0 to 500 cm; Permissible short-circuit current range passed/failed; Arc resistance range passed/failed; Capacity/electrical capacity range from 20 to 1000 pF; Capacity range from 0 to 10 pF; Capacity range from 20 to 10⁶ pF; Winding capacity range from 20*10⁻¹² to 10⁻⁶ F; Protection from mechanical access to hazardous Sections of equipment designated by the first characteristic digit range from 0 to 4 null; Corrosion resistance range compliant/noncompliant; Protection from electrical shock range passed/failed; Bending force range from 0 to 100 kN; Wear-resistance range passed/failed; Pulse withstand voltage range from 0 to 20 kV; Pulse voltage range from 0,33 to 20 kV; Operability of locking devices range passed/failed; Mechanism operability range passed/failed; Mechanism operability range passed/failed; Mechanism operability range compliant/noncompliant; Operability range compliant/noncompliant; Indicator health range passed/failed; Fixing device test range passed/failed; Electrical strength DC voltage test range passed/failed; Test load range from 0 to 10 kN; Test load range from 0 to 50 kN; Test load range from 0 to 500 kN; Test force range from 0 to 5 kN; Test voltage range from 0 to 100 kV; Test voltage range from 0 to 1000 V; Test voltage range from 0 to 230 kV; Test voltage range from 0 to 35 kV; Test voltage range from 0 to 5 kV; Test voltage range from 0 to 6 kV; Test voltage range from 1 to 230 kV; Test voltage range from 100 to 6000 V; Test AC voltage range from 0 to 230 kV; Test force range from 0 to 50 kN; Test current range passed/failed from 0 to 12 kA; Test current range passed/failed from 0

to 200 kA; Test current range passed/failed from 0 to 50 kA; Test current range from 0 to 10 kA; Test current range from 0 to 100 A; Test current range from 0 to 100 kA; Test current range from 0 to 10000 A; Test current range from 0 to 12000 A; Test current range from 0 to 200 kA; Test current range from 0 to 3 A; Test current range from 0 to 31,5 kA; Test current range from 0 to 63 kA; Test current range from 0,0001 to 100 A; Test current range from 100 to 12000 A; Test current range from 100 to 5000 A; Test current range from 10⁻⁴ to 100 A; Test current range from 50 to 5000 A; Test current/Current range from 0 to 200 kA; Corrosion-protective coating quality range passed/failed; Surface quality range passed/failed; Quality of connection between accessories and insulation part range passed/failed; Zinc coating quality range passed/failed; Cycles quantity range passed/failed; Switching characteristics range passed/failed; Switching wear-resistance range passed/failed; Switching capacity range passed/failed; Completeness range compliant/noncompliant; Contact pressure range from 0 to 5 kN; Contact pressure range from 50 to 500 N; Gas concentration range from 0 to 1000 mln⁻¹ (ppm); Absorption coefficient Calculated rate range; Mechanical strength margin range; Short-time withstand current and peak withstand current range passed/failed; Short-time current range from 0 to 200 kA; Torque moment range from 0 to 100 N*m; Torque moment range from 0 to 50 kN*m; Localization capacity range passed/failed; Terminal marking range compliant/noncompliant; Completeness of terminal marking range compliant/noncompliant; Marking and branding range confirmed/not confirmed; Marking and branding range compliant/noncompliant; Mass range passed/failed from 0,1 to 500 kg; Mass range passed/failed from 1 to 500 kg; Mass range from 0 to 10 kg; Mass range from 0 to 2000 kg; Mass range from 0 to 500 kg; Mass range from 0 to 5000 kg; Mass range from 0,02 to 122 g; Mass range from 0,5 to 500 kg; Mass range from 4 to 500 kg; Mass range compliant/noncompliant from 0 to 5000 kg; Fuse mass range from 0,05 to 500 kg; Intersection insulation range passed/failed; Turn-to-turn insulation range passed/failed; Mechanical wear-resistance range passed/failed; Mechanical load range passed/failed from 0 to 1 kN; Mechanical load range from 0 to 1 kN; Mechanical load range from 0 to 50 kN; Mechanical torsion load range passed/failed from 0 to 50 kN*m; Mechanical tensile load range passed/failed from 0 to 500 kN; Mechanical strength of terminal clamps range passed/failed; Mechanical strength range passed/failed; Mechanical strength at wind load and horizontal tension of connecting leads range passed/failed; Mechanical elements strength range passed/failed; Mechanical operability range passed/failed; Mechanical disruptive force range passed/failed; Mechanical tension force range from 0 to 500 kN; Mechanical force range from 0 to 1 kN; Mechanical force range from 0 to 10 kN*m; Mechanical force range from 0 to 500 kN; Mechanical resistance range passed/failed; Power Calculated rate range; Power range from 0 to 10 kW; Heating in continuous operating regime range from 0 to 300 °C; Load range from 0 to 1 kN; Load range from 0 to 10 kN; Reliability of screws, current-conducting Sections and connections range passed/failed; Reliability range passed/failed; Mechanical durability reliability range passed/failed; Reliability of threaded terminals for external copper conductors range passed/failed; Partial discharge initiation and extinction voltage range from 0 to 230 kV; Voltage range from 0 to 1 kV; Voltage range from 0 to 10 kV; Voltage range from 0 to 100 kV; Voltage range from 0 to 1000 V; Voltage range from 0 to 12 kV; Voltage range from 0 to 150 kV; Voltage range from 0 to 220 kV; Voltage range from 0 to 230 kV; Voltage range from 0 to 35 kV; Voltage range from 0 to 42 kV; Voltage range from 0 to 500 V; Voltage range from 100 to 6000 V; Voltage range from 50 to 5000 V; Indication voltage range from 0 to 100 kV; Voltage between terminals 1-2 range from 1 to 230 kV; Voltage between terminals 2-3 range from 1 to 230 kV; Voltage range from 40 to 100 V; Magnetization voltage/saturation voltage range compliant/noncompliant from 0 to 2000 V; Power supply voltage range from 0 to 500 V; Power supply voltage range from 0,0001 to 1000 V; DC voltage range from 0 to 70 kV; Powerfrequency voltage range from 0 to 230 kV; Response voltage Calculated rate range; Response voltage range from 0 to 1000 V; Electrical continuity of earthed metal Sections range passed/failed; Pressure continuity of sliding earthing contacts range passed/failed; Pressure continuity of sliding earthing contacts range passed/failed from 0,02 to 0,5 mm; Conductor continuity range passed/failed; Rated short-time withstand current range from 100 to 5000 A; Normalized AC supply voltage range from 0 to 500 V; Normalized DC supply voltage range from 0 to 500 V; Single-phase AC with frequency of (50±5) Hz range from 100 to 12000 A; Operation in icy conditions range passed/failed; Operation under nominal static mechanical load applied to terminals range passed/failed; Axial displacement range from 0 to 10 mm; Deviation

from nominal dimensions and shape range from 0,1 to 50 mm; Breaking capacity range passed/failed; Relative air humidity range from 10 to 98 %; Relative humidity range from 10 to 98 %; Relative humidity range from 50 to 98 %; Relative current error range from 0,01 to 100 %; Electrical contact relative resistance Calculated rate range; Voltage drop range from 0 to 100 V; AC voltage/voltage range from 0 to 230 kV; AC voltage range passed/failed from 0 to 230 kV; AC voltage range passed/failed from 0 to 6 kV; AC voltage range from 0 to 200 kV; AC voltage range from 0 to 230 kV; AC voltage range from 0 to 50 kV; AC voltage range from 1 to 230 kV; AC current range from 0 to 6000 A; AC current range range from 1 to 10000 A; Displacement range from 1 to 900 mm; Tightness of contact surfaces of detachable contact connections range passed/failed: Current density Calculated rate range: Section area Calculated rate range; Voltage scale transformation coefficient error/relative voltage error range from 0.01 to 100 %; Voltage transformer (VT) voltage scale transformation coefficient error (VT voltage error) range from 0,01 to 100 %; Voltage error and angle error range from 0,01 to 100 %; Voltage phase angle error range from -600 to +600 min; Fire safety range passed/failed; Winding polarity/Correctness of contact clamp and terminal identification range compliant/noncompliant; DC voltage range from 0 to 100 V; DC voltage range from 0 to 70 kV; DC range from 0,0001 to 100 A; DC range from 0.0001 to 100 A; DC range from 0,0001 to 100 A; DC range from 0,1 to 10000 mA; DC range from 0,0001 to 100 A; Losses range from 0 to 40 kW; Power losses range; Remagnitization losses range passed/failed; Consumed power range from 0 to 100 kW; nameplates range passed/failed; Correctness of nameplates Correctness of range compliant/noncompliant; Correctness of nameplates range compliant/noncompliant; Correctness of marking and branding range compliant/noncompliant; Adjustment correctness range compliant/noncompliant; Operation correctness range passed/failed; Temperature rise Calculated rate range; Temperature rise range passed/failed; Accuracy limit factor and safety coefficient range compliant/noncompliant; Rise of dielectrical loss angle tangent range; Breakdown voltage range from 0 to 100 kV; Breakdown voltage range from 0 to 230 kV; Bending deflection range from 0 to 100 cm; Strength of sealing of wires (cables) in the connecting and and tensioning accessories range passed/failed; Bending strength range passed/failed; Operability of auxiliary contacts range passed/failed; Operability of locking devices range passed/failed; Operability range passed/failed; Mechanical operability range passed/failed; Operability when exposed to glaze-ice range passed/failed; Radial displacement range from 0 to 10 mm; Dimensions range from 0 to 10000 mm; Dimensions range from 0 to 15000 mm; Dimensions range from 0 to 20 mm; Dimensions range from 0 to 5000 µm; Dimensions range from 0 to 6 mm; Dimensions range from 0 to 8000 mm; Dimensions range from 0,02 to 0,5 mm; Dimensions range compliant/noncompliant from 0 to 8000 mm; Breaking force range from 0 to 500 kN; Breaking bending moment Calculated rate range; Path length range from 0 to 2 m; Path length range from 0 to 50 m; Path length range from 15 to 30 mm; Leakage path length range from 0 to 8000 mm; Tension force range from 0 to 1000 kN; Tension force range from 0 to 20 kN; Tension force range from 0 to 50 kN; Tension force range from 0 to 500 kN; Tension range from 0 to 500 kN; Calculated rate: test object temperature rise range from 0 to 300 °C; Resonance frequency range compliant/noncompliant; Force range from 0 to 1 kN; Force range from 0 to 2 kN; Force range from 0 to 500 N; Force range from 0 to 500 kN; Force range from 0,1 to 10 kN; Current force range from 10⁻⁴ to 100 A; Speed/ Closing speed / Opening speed range; Calculated rate range; Proper time/closing time/opening time range from 10⁻⁷ to 10 s; Closing time range from 0,0001 to 10 s; Closing time range from 10⁻⁴ to 10 s; Opening time range from 0,0001 to 10 s; Opening time range from 10^{-4} to 10 s; Alignment of main and auxiliary circuits detachable contacts range from 0,1 to 1000 mm; Compliance of insulation with rated test voltage /insulation strength range passed/failed; Compliance with the design drawings range compliant/noncompliant; Compliance with the assembly drawing range compliant/noncompliant; Compliance with the assembly drawing of surface condition of external insulation Sections range compliant/noncompliant; Compliance with the technical documentatiom range compliant/noncompliant; Supporting documentation range compliant/noncompliant; Resistance/resistance of current-conducting circuit/resistance of current-conducting circuit elements range from 10⁻⁶ to 1999,9 Ohm; Auxiliary contact resistance class 3 range passed/failed from 10⁻⁶ to 1999,9 Ohm/from 10⁻⁴ to 100 A; Auxiliary contact resistance class 1 and 2 range passed/failed from 0,000001 to 1999.9 Ohm; Resistance of the gear main circuit/DC resistance range from 0,000001 to 199,9 Ohm; Resistance of the main circuit range from 1*10⁻⁶ to 1999,9 Ohm; Resistance range from 0 to 1

kOhm; Resistance range from 0 to 1000 µOhm; Resistance range from 0,000001 to 199,9 Ohm; Insulation resistance range passed/failed; Insulation resistancerange from 0 to 1000 GOhm; Insulation resistance range from 10^{-11} to 300 GOhm; Insulation resistance range from $3*10^3$ to 1000*10° Ohm; Insulation resistance range from 3*10³ to 10¹² Ohm; Insulation resistance range from 3.10³ to 10¹² Ohm; Winding insulation resistance range passed/failed from 3*10³ to 10¹² Ohm; Winding insulation resistance range from 0 to 1000 GOhm; Contact and connection resistance of the main circuit range from 1*10⁻⁶ to 1999,9 Ohm; DC winding resistance range from 0,0001 to 100000 Ohm; DC winding resistance range from $2*10^{-4}$ to $2*10^{5}$ Ohm; DC resistance range passed/failed from 10⁻⁶ to 1999,9 Ohm; Resistance of current-conducting circuit and its individual elements range from 10⁻⁶ to 199.9 Ohm: Resistance of current-conducting circuit range from *10⁻⁶ to 199,9 Ohm; Electrical contact resistance range from 10⁻⁶ to 199,9 Ohm; Auxiliary contact resistance class 1 range from 1*10⁻⁶ to 1999,9 Ohm; Auxiliary contact resistance class 2 range from 1*10⁻⁶ to 1999,9 Ohm; Auxiliary contact resistance class 3 range from 1*10⁻⁶ to 1999,9 Ohm; Protective coating condition range passed/failed; Protective coating condition range compliant/noncompliant; Protective coating condition range passed/failed; Protective coating condition of external Sections range passed/failed; Protective coating condition of external Sections range compliant/noncompliant; Condition of grounding clamp pads range passed/failed; Condition of grounding clamp pads range compliant/noncompliant; Surface condition range passed/failed; Surface condition range compliant/noncompliant; External surface condition range passed/failed; Rated short-circuit making current making capacity range passed/failed; Degree of protection range passed/failed; Degree of protection from external hard objects range passed/failed from 1 to 4 null; Degree of protection from access to hazardous parts Sections range passed/failed from 1 to 4 null; Degree of protection from access to hazardous parts Sections range passed/failed from A to D null; Water absorption resistance range passed/failed; Arc resistance at internal short-circuit range passed/failed; Resistance to frost with its subsequent melting range passed/failed; Resistance to condensation and water penetration range passed/failed; Short-time current withstand range passed/failed; Resistance to single shocks range passed/failed; Resistance to temperature change range passed/failed; Resistance to shocks range passed/failed from 0 to 60 J; Electrical arc resistance range passed/failed; Resistance to dynamic shock-circuit effects/resistance at short-circuit/shortcircuit current withstand range passed/failed; Resistance to locking device removal range passed/failed; Resistance to climatic factors range passed/failed; Corrosion resistance range passed/failed; Resistance to short-time rated overcurrent range passed/failed; Resistance to slow temperature change range passed/failed; Resistance to slow temperature change range passed/failed from -70 to +130 °C; Resistance to mechanical force range passed/failed from 0 to 500 kN; Resistance to heating range passed/failed; Resistance to rated current-induced heating range passed/failed; Resistance to continuous spark flow range passed/failed; Resistance to water penetration range passed/failed; Resistance to water penetration range passed/failed; Resistance to dye penetration range passed/failed; Resistance to temperature jump range passed/failed from 50 to 80 °C; Short-circuit through current withstand range passed/failed; Resistance to thermal shock load range passed/failed; Thermal impact resistance/resistance to thermal shock load range passed/failed; Thermal impact resistance range passed/failed; Short-circuit current withstand range passed/failed; Mark permanency range passed/failed; Short-circuit current withstand/shortcircuit current withstand range passed/failed; Short-circuit current withstand/short-circuit current withstand/shock impact withstand range passed/failed; Short-circuit current withstand range passed/failed; Through current withstand range passed/failed; Short-circuit through current withstand range passed/failed; Actuator resistance to current-induced heating range passed/failed; Dielectrical loss angle tangentrange from 0,01 to 100 %; Temperature Calculated rate range; Water temperature range from +15 to +95 °C; Water temperature range from 0 to 100 °C; Temperature range passed/failed from 0 to 300 °C; Temperature range from +15 to +95 °C; Temperature range from +20 to +60 °C; Temperature range from -20 to -7 °C; Temperature range from -40 to +100 °C; Temperature range from -40 to +300 °C; Temperature range from -40 to +85 °C; Temperature range from -60 to +70 °C; Temperature range from -60 to +75 °C; Temperature range from -60 to +85 °C; Temperature range from -60 to 0 °C; Temperature range from -60 to 85 °C; Temperature range from -7 to +2 °C; Temperature range from -70 to +155 °C; Temperature range from -70 to 0 °C; Temperature range from -70 to 155 °C; Temperature range from 0 to +155 °C; Temperature range from 0 to +300 °C; Temperature range from 0 to 100 °C;

Temperature range from 0 to 130 °C; Temperature range from 0 to 300 °C; Temperature range from 0 to 85 °C; Temperature range from 10 to 80 °C; Temperature range from 20 to 100 °C; Temperature range from 20 to 40 °C; Temperature range from 50 to 80 °C; Ambient temperature range from -40 to +85 °C; Ambient temperature range from -40 to 300 °C; Ambient temperature range from 0 to 300 °C; Temperature of Sections range from -40 to 300 °C; Thermal resistance range passed/failed; Thermal resistance at short-circuit /Thermal resistance at short-circuit range passed/failed; Thermal resistance at short-circuit range passed/failed; Thermal resistance range passed/failed; Technical documents range compliant/noncompliant; Current/ Conventional tripping current range from 1 to 10000 A; Current Calculated rate range; Current range from 0 to 10 kA; Current range from 0 to 100 A; Current range from 0 to 100 kA; Current range from 0 to 150 kA; Current range from 0 to 200 kA; Current range from 0 to 250 kA; Current range from 0 to 50 kA; Current range from 0 to 500 A; Current range from 0 to 63 kA; Current range from 0,0001 to 100 A; Current range from 0,001 to 100 A; Current range from 0,5 to 6 kA; Current range from 1 to 6 kA; Current range from 100 to 5000 A; Current range from 10⁻³ to 100 A; Current range from 10⁻⁴ to 100 A; Current range from 10⁻⁴ to 100 A; Current range from 50 to 12000 A; Test dynamic current/test current range from 0 to 200 kA; Test dynamic current /test current range from 0 to 200 kA; Test thermal current range from 0 to 100 kA; Short-circuit current range from 0 to 200 kA; Exciting current range from 0 to 100 A; Exciting current /saturation current range compliant/noncompliant from 0 to 100 A; Overcurrent range from 50 to 12000 A; Useful current range from 0 to 100 A; Useful current of control electromagnets range from 0 to 1000 A; Actuating current range from 0 to 30 A; Corrosion-protective coating thickness range from 5 to 5000 µm; Thickness range from 0 to 20 mm; Protective coating thickness range from 0 to 5000 µm; Zinc coating thickness range passed/failed from 0 to 5000 μ m; Angle error (voltage phase angle error) range from -600 to +600 min; Specific conductance of water range from 0,1 to 1,5 S/m; Specific conductance range from 0 to 2000 µS/cm; Specific electrical resistance Calculated rate range; Specific insulation resistance range; Package and mark range compliant/noncompliant; Partial discharge/Partial discharge range from 1 to 10000 pC; Radio interference range passed/failed from 0 to 100 dB; Radio interference/Radio interference range passed/failed from 10 to 100 dB; Partial discharge/apparent charge of partial discharge range from 1 to 10⁴ pC; Partial discharge range from 1 to 10⁴ pC; Partial discharge at test voltage normalized value range from 1 to 10000 pC; Force range from 0 to 1 kN; Force range from 0 to 100 N; Force range from 0 to 500 N; Pressure force range from 50 to 500 N; Acceleration range from 1,5 to 400 m/s²; Resistance to humidity range passed/failed; Resistance to rain crust range passed/failed; Resistance to sinusoidal vibration range passed/failed; Resistance to sinusoidal and wide-band random vibration range passed/failed; Resistance to temperature range passed/failed; Resistance to temperature and humidity range passed/failed; Resistance to climatic ambient factors range passed/failed; Resistance to climatic factors range passed/failed; Resistance to sinusoidal vibration range passed/failed; Resistance to short-circuit current range passed/failed; Gas leak range from 0 to 0,0274 %/day; Fixing range passed/failed; Operation range passed/failed; Travel of main- and auxiliary circuit detachable contacts range from 0,1 to 1000 mm; Cold resistance (freezing resistance) range passed/failed; Cold resistance range passed/failed; Cycles (lifelength) range from 0 to 100000 cycles; Cycles range from 0 to 10000 cycles; Cycles range from 0 to 30 cycles; Cycles range from 100 to 300 cycles; Rotation frequency range passed/failed from 10 to 30000 r/min; Rotation frequency range from 100 to 30000 r/min; Frequency range from 10 to 10000000 Hz; Frequency range from 20 to 200000 Hz; Frequency range from 3 to 400 Hz; Frequency range from 5 to 600 Hz; Width range from 0 to 50 m; Electrical continuity of grounded metal Sections range passed/failed; Insulation strength of insulating part range passed/failed; Insulation strength/Insulation relative to ground of transformer winding linear terminals with incomplete neutral insulation/ Linear terminal insulation strength at short-time AC voltage/ Linear terminal insulation strength range passed/failed; Insulation strength /Short-time AC applied voltage/Short-time AC applied voltage range passed/failed; Insulation strength/Internal insulation strength/electrical strength of internal transformer insulation range passed/failed; Insulation strength of auxiliary and control circuits range passed/failed; Insulation strength range passed/failed; Insulation strength of measurement terminal range passed/failed; Insulation strength at short-time power-frequency voltage range passed/failed; Insulation strength/insulation strength range passed/failed; Intersection insulation strength at power-frequency voltage range passed/failed; Electrical strength of operating part range passed/failed; Current range from 0 to 100 A; Current range from 0,0001 to 100 A; Electrical resistance range from 0 to 1000 microOhm; Electrical resistance range from 0.000001 to 199,9 Ohm; Electrical resistance range from 1 to 1000 microOhm; Electrical resistance range from 10⁻⁶ to 199,9 Ohm; Electrical resistance range from 10⁻⁶ to 199,9 Ohm; Electrical resistance range from 10⁻⁶ to 1999,9 Ohm; Electrical resistance range from 10⁻⁶ to 1999,9 Ohm; Electrical resistance of replaceable element range; Electrical insulation resistance range passed/failed from 0 to 10^{12} Ohm: Electrical insulation resistance range from 0 to 1000 GOhm: Electrical insulation resistance range from 10⁻⁶ to 1999,9 Ohm; Electrical insulation resistance range from 3*10³ to 1000*10⁹ Ohm; Electrical insulation resistance range from 3*10³ to 10¹² Ohm; Electrical insulation resistance of charging device range from $3*10^3$ to 10^{12} Ohm; Electrical DC current resistance/DC current resistance range from 10⁻⁶ to 9990 Ohm; Electrical DC current resistance range from 10⁻⁶ to 1999,9 Ohm; Electrical resistance/Electrical resistance of power cores and conductors range from 10⁻⁶ to 199,9 Ohm; Electrical insulation properties/insulation strength range passed/failed; shock energy range from 0 to 60 J; frost with its subsequent melting range passed/failed; time range from 10⁻⁷ to 10 s; displacement range from 0 to 900 mm; surface condition of external insulation Sections range passed/failed Procedure

Resistance to climatic and mechanical ambient factors test methods for machines, instruments, and all types of miscellaneous technical products. Humidity testing GOST R 51369-99 Clause 4; methods 207-1, 207-2, 207-3, 207-4, 207-5; Resistance to climatic and mechanical ambient factors test methods for machines, instruments, and all types of miscellaneous technical products. Humidity testing GOST R 51369-99 clause 5; methods 208-1, 208-2; AC load-break switches for voltages from 3 to 10 kV. General specifications GOST 17717-79 Subclause 7.1.1; AC load-break switches for voltagesfrom 3 to 10 kV. General specifications GOST 17717-79 Subclause 7.7; AC circuit-breakers for voltages from 3 to 750 kV. General specifications GOST R 52565-2006 Subclause 9.10.2.1, 9.10.2.2, 9.10.2.3, 9.10.4, 9.10.5; Low-voltage control switchgear. Part 1. General requirements GOST IEC 61439-1-2013 Subclause 10.9; Small electrical switchgear. Overcurrent protection circuit-breakers for household and analogous use. Part 1. AC automatic circuit-breakers GOST IEC 60898-1-2020 Subclause 9.10; Small electrical switchgear. Overcurrent protection circuit-breakers for household and analogous use. Part 1. AC automatic circuit-breakers GOST IEC 60898-1-2020 Subclause 9.12 (short-circuit current withstand); Small electrical switchgear. Overcurrent protection circuit-breakers for household and analogous use. Part 1. AC automatic circuit-breakers GOST IEC 60898-1-2020 Subclause 9.12 (switching capacity); Small electrical switchgear. Overcurrent protection circuit-breakers for household and analogous use. Part 1. AC automatic circuit-breakers GOST IEC 60898-1-2020 Subclause 9.14; Small electrical switchgear. Overcurrent protection circuit-breakers for household and analogous use. Part 1. AC automatic circuit-breakers GOST IEC 60898-1-2020 Subclause 9.6; Small electrical switchgear. Overcurrent protection circuit-breakers for household and analogous use. Part 1. AC automatic circuit-breakers GOST IEC 60898-1-2020 Subclause 9.7.3; Small electrical switchgear. Overcurrent protection circuit-breakers for household and analogous use. Part 1. AC automatic circuit-breakers GOST IEC 60898-1-2020 Subclause 9.7.4 (insulation resistance); Small electrical switchgear. Overcurrent protection circuit-breakers for household and analogous use. Part 1. AC automatic circuit-breakers GOST IEC 60898-1-2020 Subclause 9.7.4 (auxiliary circuit strength); Small electrical switchgear. Overcurrent protection circuit-breakers for household and analogous use. Part 1. AC automatic circuit-breakers GOST IEC 60898-1-2020 Subclause 9.7.5 (pulse voltage); Small electrical switchgear. Overcurrent protection circuit-breakers for household and analogous use. Part 1. AC automatic circuitbreakers GOST IEC 60898-1-2020 Subclause 9.8; Small electrical switchgear. Overcurrent protection circuit-breakers for household and analogous use. Part 1. AC automatic circuitbreakers GOST IEC 60898-1-2020 Subclause 9.9; AC gears and electrotechnical devices for voltages greater than 1000 V. Heating rates in continuous operating regime and test methods GOST 8024-90 Subclause 2.6; Low-voltage electrical gears. Test methods GOST 2933-83 Subclause 5; Low-voltage electrical gears. Test methods GOST 2933-83 Subclauses 6.2-6.5; Low-voltage electrical gears. Test methods GOST 2933-83 Subclause 4.1; Low-voltage Electrical gears. Test methods GOST 2933-83 Subclause 4.2; Low-voltage electrical gears. Test methods GOST 2933-83 Subclause10; Low-voltage electrical gears. Test methods GOST 2933-83 Subclause 6.6; Low-voltage electrical gears. Test methods GOST 2933-83 Subclause 9; Line

accessories. Acceptance rules and test methods GOST R 51155-2017 Subclause 5.3.4 - 5.3.6; Line accessories. Acceptance rules and test methods GOST R 51155-2017 Subclause 5.3.8; Insulated bushings for alternating voltages greater than 1000 V IEC 60137(2017) Subclause 8.10; Insulated bushings for alternating voltages greater than 1000 V IEC 60137(2017) Subclause 8.9; Insulated bushings for alternating voltages greater than 1000 V. General specifications GOST R 55187-2012 Subclause 9.18 (field tests); Insulated bushings for alternating voltages greater than 1000 V. General specifications GOST R 55187-2012 Subclause 9.5; Insulated bushings for alternating voltages greater than 1000 V. General specifications GOST R 55187-2012 Subclause 9.7; Insulated bushings for alternating voltages greater than 1000 V. General specifications GOST R 55187-2012 Subclauses 9.12, 9.13; Electrical bushingsin nuclear power plant enclosure structure GOST R 52287-2004 (IEC 60772-1983) Subclause 6.4.10; Electrical bushingsin nuclear power plant enclosure structure GOST R 52287-2004 (IEC 60772-1983) Subclause 6.4.3; Electrical bushings in nuclear power plant enclosure structure GOST R 52287-2004 (IEC 60772-1983) Subclause 6.4.9; Electrical bushings in nuclear power plant enclosure structure GOST R 52287-2004 6.4.9; AC load-break switches for voltages from 3 to 10 kV. General specifications GOST 17717-79 Subclause 7.4.3.2; AC load-break switches for voltages from 3 to 10 kV. General specifications GOST 17717-79 Subclause 7.1.2(mass); AC load-break switches for voltages from 3 to 10 kV. General specifications GOST 17717-79 Subclause 7.1.2(dimensions); AC load-break switches for voltages from 3 to 10 kV. General specifications GOST 17717-79 Subclause 7.4.2.1; AC load-break switches for voltages from 3 to 10 kV. General specifications GOST 17717-79 Subclause 7.5; AC load-break switches for voltages from 3 to 10 kV. General specifications GOST 17717-79 Subclause7.4.3; AC loadbreak switches for voltages from 3 to 10 kV. General specifications GOST 17717-79 Subclause7.8.1; AC load-break switches for voltages from 3 to 10 kV. General specifications GOST 17717-79 Subclause 7.4.1.2; AC load-break switches for voltages from 3 to 10 kV. General specifications GOST 17717-79 Subclause 7.4.2.1; AC circuit-breakers for voltages from 3 to 750 kV. General specifications GOST R 52565-2006 9.5; AC circuit-breakers for voltages from 3 to 750 kV. General specifications GOST R 52565-2006 Subclause 9.2.1.2, 9.2.2.4; AC circuit-breakers for voltages from 3 to 750 kV. General specifications GOST R 52565-2006 Subclause 9.2.1.2, 9.2.2.5; AC circuit-breakers for voltages from 3 to 750 kV. General specifications GOST R 52565-2006 Subclause 9.2.1.2, 9.2.2.6; AC circuit-breakers for voltages from 3 to 750 kV. General specifications GOST R 52565-2006 Subclause 9.2.1.2, 9.2.2.8; AC circuit-breakers for voltages from 3 to 750 kV. General specifications GOST R 52565-2006 Subclause 9.2.1.2, 9.2.4; AC circuit-breakers for voltages from 3 to 750 kV. General specifications GOST R 52565-2006 Subclause 9.2.1.2, 9.2.5; AC circuit-breakers for voltages from 3 to 750 kV. General specifications GOST R 52565-2006 Subclause 9.2.1.2, 9.2.6; AC circuit-breakers for voltages from 3 to 750 kV. General specifications GOST R 52565-2006 Subclause 9.6; AC circuit-breakers for voltages from 3 to 750 kV. General specifications GOST R 52565-2006 Subclause 9.7; AC circuit-breakers for voltages from 3 to 750 kV. General specifications GOST R 52565-2006 Subclause 9.1; AC circuit-breakers for voltages from 3 to 750 kV. General specifications GOST R 52565-2006 Subclause 9.2.1.2, 9.2.2.2; AC circuitbreakers for voltages from 3 to 750 kV. General specifications GOST R 52565-2006 Subclause 9.2.1.2, 9.2.2.3; AC circuit-breakers for voltages from 3 to 750 kV. General specifications GOST R 52565-2006 Subclause 9.2.1.2, 9.2.2.9; AC circuit-breakers for voltages from 3 to 750 kV. General specifications GOST R 52565-2006 Subclause 9.2.1.2, 9.2.3; National Measurement Assurance System. Voltage transformers. Verification procedure GOST 8.216-2011 Subclause 10.2; National Measurement Assurance System. Voltage transformers. Verification procedure GOST 8.216-2011 Subclause 10.3; National Measurement Assurance System. Current transformers. Verification procedure GOST 8.217-2003 Subclause 9.4; National Measurement Assurance System. Current transformers. Verification procedure GOST 8.217-2003 Subclauses 9.3, 9.5; Electrotechnical products. Resistance to climatic and mechanical ambient factors test methods GOST 16962.1-89 Subclause 2.14, method 222; Ceramic base insulators for voltages greater than1000 V. General specifications GOST R 52034-2008 Subclause 7.2.1; Ceramic base insulators for voltages greater than1000 V. General specifications GOST R 52034-2008 Subclause 7.2.2; Ceramic base insulators for voltages greater than1000 V. General specifications GOST R 52034-2008 Subclauses 7.4.2, 7.4.7, 7.4.9; Ceramic insulators. Test methods GOST 26093-84 Subclause 3.2.1.3; Ceramic insulators. Test methods GOST 26093-84 Subclause

3.2.1.4; Ceramic insulators. Test methods GOST 26093-84 Subclause 3.2.2.2; Ceramic insulators. Test methods GOST 26093-84 Subclause 4.2.3; Ceramic insulators. Test methods GOST 26093-84 Subclause 5.2; Ceramic insulators. Test methods GOST 26093-84 Subclauses 1.7, 3.1.2, 3.1.3, 3.2.1.1-3.2.1.4, 3.2.2.1; Linear suspended rod polymer insulators. General specifications GOST R 55189 Subclause 8.5.5; Linear suspended rod polymer insulators. General specifications GOST R 55189-2012 Subclause 8.5.4; Linear suspended rod polymer insulators. General specifications GOST R 55189-2012 Subclause 8.7.6; Linear suspended platelike insulators. General specifications GOST 6490 Subclause 7.3.4 (zinc coating quality); Linear suspended plate-like insulators. General specifications GOST 6490 Subclause 7.4.1; Linear rod porcelain and glass insulators for voltages from 1 to 35 kV. General specifications GOST 1232 Subclause 8.12.1; Linear rod porcelain and glass insulators for voltages from 1 to 35 kV. General specifications GOST 1232 Subclause 8.12.2; Linear rod porcelain and glass insulators for voltages from 1 to 35 kV. General specifications GOST 1232 Subclause 8.13; Organic base insulators for internal installation system for rated voltages greater than 1000 V. Test methods GOST 28739-90 Subclause 22; Outdoor polymer post insulators for voltages 6-220 kV. General specifications GOST R 52082 Subclause 8.4, Annex M; Outdoor polymer post insulators for voltages 6-220 kV. General specifications GOST R 52082 Subclauses 8.6.4 - 8.6.5; Outdoor polymer post insulators for voltages 6-220 kV. General specifications GOST R 52082-2003 Subclause 8.9.4; Outdoor polymer post insulators for voltages 6-220 kV. General specifications GOST R 52082-2003 Subclause 8.9.7; Outdoor polymer post insulators for voltages 6-220 kV. General specifications GOST R 52082-2003 Subclauses 8.9.5.1, 8.9.5.2, 8.9.5.5 (tearing); Instruction Operation manual «Magnetic coating thickness gaugeTM-MG4» KBSSUBCLAUSE427634.051-1 RE clause 2; Instruction Operation manual Crane-suspended balance VSK-A clause 3; Instruction Operation manual Pressure-force gauge CMR-1, Subclause 5.2; Instruction Operation manual Megaohmmeters E6-32, E6-31, and E6-31/1 RAPM.411218.002RE; CABLES, WIRES AND CORES Electrical resistance of power cores and conductors test method GOST 7229 clauses 4, 5; Power cables with plastic insulation for rated voltages 0,66, 1, and 3 kV. General specifications GOST 31996-2012 Subclause 8.3.3; Power cables with plastic insulation for rated voltages 0,66, 1, and 3 kV. General specifications GOST 31996-2012 Subclause 8.3.4 (AC voltage method); Power cables with plastic insulation for rated voltages from 6 to 35 kV inclusively. General specifications GOST R 55025-2012 Subclause 8.3.6; High-voltage switchgear. General specifications GOST R 55716-2013 Subclause 6.4; High-voltage switchgear. General specifications GOST R 55716-2013 Subclause 6.6; Coupling and power take-off capacitors for power transmission lines. Specifications GOST 15581 Subclause 5.15; Coupling and power take-off capacitors for power transmission lines. Specifications GOST 15581 Subclause 5.20; Coupling and power take-off capacitors for power transmission lines. Specifications GOST 15581 Subclause 5.21; Coupling and power take-off capacitors for power transmission lines. Specifications GOST 15581 Subclause 5.23; Coupling and power take-off capacitors for power transmission lines. Specifications GOST 15581 Subclauses 5.4, 5.14; Rotating electrical machines. General test methods GOST 11828-86, clause 2, 3; Rotating electrical machines. General test methods GOST 11828-86, clause 2, 4; Rotating electrical machines. General test methods GOST 11828-86, clause 2, 6; Rotating electrical machines. General test methods GOST 11828-86, clause 2, 7; Rotating electrical machines. General test methods GOST 11828-86, clause 2, 8; Rotating electrical machines. General test methods GOST 11828-86, clause 2, 9; Rotating electrical machines. General test methods GOST 11828-86, clause 2,10; Interstate standards accepted as RF National standards GOST 12179-76 clauses 3, 4; Interstate standards accepted as RF National standards GOST 1232-2017 Subclause 8.5 (leakage path length); Interstate standards accepted as RF National standards GOST 1232-2017 Subclause 8.5 (mass); Interstate standards accepted as RF National standards GOST 1232-2017 Subclause 8.5 (dimensions); Interstate standards accepted as RF National standards GOST 1232-2017 Subclause 8.6; Interstate standards accepted as RF National standards GOST 1232-2017 Subclauses 8.8, 8.9, 8.11; Interstate standards accepted as RF National standards GOST 14254-2015 (IEC 60529:2013) clause 12; Interstate standards accepted as RF National standards GOST 14254-2015 (IEC 60529:2013) clause 13; Interstate standards accepted as RF National standards GOST 14254-2015 (IEC 60529:2013) clause 15; Interstate standards accepted as RF National standards GOST 14694-76 clause 10: Interstate standards accepted as RF National standards GOST 14694-76 clause 11; Interstate standards

accepted as RF National standards GOST 14694-76 clause 7; Interstate standards accepted as RF National standards GOST 14694-76 Subclause 1.1; Interstate standards accepted as RF National standards GOST 14694-76 Subclause 1.5; Interstate standards accepted as RF National standards GOST 14694-76 Subclause 4.10; Interstate standards accepted as RF National standards GOST 14694-76 Subclause 4.8; Interstate standards accepted as RF National standards GOST 14694-76 Subclause 4.9; Interstate standards accepted as RF National standards GOST 14694-76 Subclauses 5.1, 5.2; Interstate standards accepted as RF National standards GOST 1516.3-96 Subclauses 4.3, 4.4, 4.5.4, 4.5.5, 4.14, 8.1.4, 8.2.2, 8.3, 8.4.2, 8.4.5, 13.5, 13.6; Interstate standards accepted as RF National standards GOST 15581-80 Subclause 5.12; Interstate standards accepted as RF National standards GOST 15581-80 Subclause 5.16; Interstate standards accepted as RF National standards GOST 15581-80 Subclause 5.17; Interstate standards accepted as RF National standards GOST 15581-80 Subclause 5.19; Interstate standards accepted as RF National standards GOST 15581-80 Subclause 5.2; Interstate standards accepted as RF National standards GOST 15581-80 Subclause 5.22; Interstate standards accepted as RF National standards GOST 15581-80 Subclause 5.6; Interstate standards accepted as RF National standards GOST 15581-80 Subclause 5.7 (visual); Interstate standards accepted as RF National standards GOST 15581-80 Subclause 5.7 (measuring tool); Interstate standards accepted as RF National standards GOST 15581-80 Subclauses 5.18; Interstate standards accepted as RF National standards GOST 15581-80 Subclauses 5.3; Interstate standards accepted as RF National standards GOST 15581-80 Subclauses 5.4, 5.14; Interstate standards accepted as RF National standards GOST 17441-84 Subclause 2.6; Interstate standards accepted as RF National standards GOST 19264-82 Subclause 7.4; Interstate standards accepted as RF National standards GOST 19264-82 Subclause 7.7; Interstate standards accepted as RF National standards GOST 20493-2001 Subclause 8.6; Interstate standards accepted as RF National standards GOST 20493-2001 Subclauses 8.1, 8.2; Interstate standards accepted as RF National standards GOST 26093-84 Subclause 4.2.1; Interstate standards accepted as RF National standards GOST 26093-84 Subclause 4.2.2; Interstate standards accepted as RF National standards GOST 26093-84 Subclause 4.2.4; Interstate standards accepted as RF National standards GOST 26093-84 Subclause 5.1.1; Interstate standards accepted as RF National standards GOST 26093-84 Subclause 5.7; Interstate standards accepted as RF National standards GOST 26093-84 Subclauses 4.2.1, 4.3.1; Interstate standards accepted as RF National standards GOST 28856-90 Subclause 5.4.1.1 (dimensions); Interstate standards accepted as RF National standards GOST 28856-90 Subclause 5.4.1.2; Interstate standards accepted as RF National standards GOST 28856-90 Subclauses 5.2.2, 5.2.3; Interstate standards accepted as RF National standards GOST 2933-83 Subclause 2.1; Interstate standards accepted as RF National standards GOST 2933-83 Subclause 2.2; Interstate standards accepted as RF National standards GOST 2933-83 Subclause 2.5; Interstate standards accepted as RF National standards GOST 2933-83 Subclause 3; Interstate standards accepted as RF National standards GOST 2933-83 Subclause 8; Interstate standards accepted as RF National standards GOST 2990-78 Subclauses 4.1, 4.2; Interstate standards accepted as RF National standards GOST 30284-2017 Subclause 7.12; Interstate standards accepted as RF National standards GOST 30284-2017 Subclause 7.13; Interstate standards accepted as RF National standards GOST 30284-2017 Subclause 7.15; Interstate standards accepted as RF National standards GOST 30284-2017 Subclause 7.5; Interstate standards accepted as RF National standards GOST 30284-2017 Subclause 7.6; Interstate standards accepted as RF National standards GOST 3345-76 clauses 2, 3, 4; Interstate standards accepted as RF National standards GOST 34204-2017 Subclause 7.10; Interstate standards accepted as RF National standards GOST 34204-2017 Subclause 7.15; Interstate standards accepted as RF National standards GOST 34205-2017 Subclause 7.10, 7.11; Interstate standards accepted as RF National standards GOST 34205-2017 Subclause 7.7; Interstate standards accepted as RF National standards GOST 34839-2022 Subclause 9.3.7; Interstate standards accepted as RF National standards GOST 34839-2022 Subclauses 9.3.1, 9.3.2; Interstate standards accepted as RF National standards GOST 3484.1-88 Clause 4; Interstate standards accepted as RF National standards GOST 3484.3-88 Subclause 4.2; Interstate standards accepted as RF National standards GOST 3484.3-88 Subclauses 4.1.1-4.1.3; Interstate standards accepted as RF National standards GOST 3484.3-88 Subclauses 4.1.4; Interstate standards accepted as RF National standards GOST 6490-2017 Subclause 7.3.1; Interstate standards accepted as RF National standards GOST 6490-2017 Subclause 7.3.2.4; Interstate standards accepted as RF

National standards GOST 6490-2017 Subclause 7.3.4 (zinc coating thickness); Interstate standards accepted as RF National standards GOST 6490-2017 Subclause 7.3.5 (axial displacement); Interstate standards accepted as RF National standards GOST 6490-2017 Subclause 7.3.5 (radial displacement); Interstate standards accepted as RF National standards GOST 6490-2017 Subclause 7.3.6; Interstate standards accepted as RF National standards GOST 6490-2017 Subclause 7.5.2 (mechanical disruptive force); Interstate standards accepted as RF National standards GOST 6490-2017 Subclauses 7.3.2.1-7.3.2.3; Interstate standards accepted as RF National standards GOST 6490-2017 Subclauses 7.5.1, 7.5.4; Interstate standards accepted as RF National standards GOST 6581-75 Subclauses 1.4, 1.5, clause 4; Interstate standards accepted as RF National standards GOST 6815-79 Subclause 6.1; Interstate standards accepted as RF National standards GOST 6815-79 Subclause 6.12; Interstate standards accepted as RF National standards GOST 6815-79 Subclause 6.2; Interstate standards accepted as RF National standards GOST 8024-90 Subclause 2.1; Interstate standards accepted as RF National standards GOST 8024-90 Subclause 2.2; Interstate standards accepted as RF National standards GOST 8024-90 Subclause 2.3; Interstate standards accepted as RF National standards GOST 8024-90 Subclause 2.4; Interstate standards accepted as RF National standards GOST 8024-90 Subclause 2.5; Interstate standards accepted as RF National standards GOST 9920-89 (ST SEV 6465-88, IEC 815-86, IEC 694-80) Subclause 2.2; Interstate standards accepted as RF National standards GOST IEC 60044-1-2013 Subclause 9.2; Interstate standards accepted as RF National standards GOST IEC 60044-1-2013 Subclause 9.3; Interstate standards accepted as RF National standards GOST IEC 60898-1-2020 Subclause 9.11; Interstate standards accepted as RF National standards GOST IEC 60898-1-2020 Subclause 9.3; Interstate standards accepted as RF National standards GOST IEC 60898-1-2020 Subclause 9.4; Interstate standards accepted as RF National standards GOST IEC 60898-1-2020 Subclause 9.5; Interstate standards accepted as RF National standards GOST IEC 60898-1-2020 Subclause 9.7.2; Interstate standards accepted as RF National standards GOST IEC 61439-1-2013 Subclause 10.10; Interstate standards accepted as RF National standards GOST IEC 61439-1-2013 Subclause 10.11; Interstate standards accepted as RF National standards GOST IEC 61439-1-2013 Subclause 10.2.7; High-voltage test techniques. Partial discharge tests GOST R 55191-2012 clauses 5, 8; Environmental effect testing for machines, instruments, and all types of miscellaneous technical products. General requirementsGOST 30630.0.0-99 clauses 4, 7, Subclauses 8.1-8.9; Tests for resistance to climatic ambient factors for machines, instruments, and all types of miscellaneous technical products. Humidity testing GOST R 51369-99 clause 7; method 206-1 (Resistance to frost with its subsequent melting); Tests for resistance to climatic ambient factors for machines, instruments, and all types of miscellaneous technical products. Humidity testing GOST R 51369-99 clause 8; method 222-1 (Tests for operability when exposed to glaze-ice); Tests for resistance to climatic ambient factors for machines, instruments, and all types of miscellaneous technical products. Temperature testing GOST 30630.2.1-2013, clause 4; methods 201-1.1, 201-1.2, 201-2.1.1, 201-2.1.2, 201-2.3.1, 201-2.3.2; Tests for resistance to climatic ambient factors for machines, instruments, and all types of miscellaneous technical products. Temperature testing GOST 30630.2.1-2013, clause 5; method 202-1; Tests for resistance to climatic ambient factors for machines, instruments, and all types of miscellaneous technical products. Temperature testing GOST 30630.2.1-2013, clause 6; methods 203-1, 203-2.1, 203-2.2; Tests for resistance to climatic ambient factors for machines, instruments, and all types of miscellaneous technical products. Temperature testing GOST 30630.2.1-2013, clause 7; method 204-1; Tests for resistance to climatic ambient factors for machines, instruments, and all types of miscellaneous technical products. Temperature testing GOST 30630.2.1-2013, clause 8; methods 205-1.1, 205-2; Test for mechanical ambient factors for machines, instruments, and all types of miscellaneous technical products. Selecting a vibration test method GOST R IEC 60068-2-1 Clauseы 4, 5, 6, 8; Test for mechanical ambient factors for machines, instruments, and all types of miscellaneous technical products. Selecting a vibration test method GOST R IEC 60068-2-2 clauses 4, 5, 6, 8; Test for mechanical ambient factors for machines, instruments, and all types of miscellaneous technical products. Vibration testing GOST 30630.1.2-99 Subclause 5.4; method 103-1.1; Test for mechanical ambient factors for machines, instruments, and all types of miscellaneous technical products. Vibration testing GOST 30630.1.2-99 Subclause 4.3; method 102-1; Test for mechanical ambient factors for machines, instruments, and all types of miscellaneous technical products. Vibration testing GOST 30630.1.2-99 Subclause 4.6 method 102-4; Test for

mechanical ambient factors for machines, instruments, and all types of miscellaneous technical products. Vibration testing GOST 30630.1.2-99 Subclause 5.10; method 103-2.1; Short-current resistance test methods GOST 20243-74; High-voltage switch mechanism and control mechanism - Part 1: General specifications for AC switching control mechanism IEC 62271-1-2017 ed. 2.1 Subclause 7.10.5; High-voltage switch mechanism and control mechanism - Part 1: General specifications for AC switching control mechanism IEC 62271-1-2017 ed. 2.1 Subclause 7.4.3; High-voltage switch mechanism and control mechanism - Part 1: General specifications for AC switching control mechanism - Part 1: General specifications for AC switching control mechanism IEC 62271-1-2017 ed. 2.1 Subclause 7.4.3; High-voltage switch mechanism and control mechanism - Part 1: General specifications for AC switching control mechanism - Part 1: General specifications for AC switching control mechanism - Part 1: General specifications for AC switching control mechanism - Part 1: General specifications for AC switching control mechanism - Part 1: General specifications for AC switching control mechanism - Part 1: General specifications for AC switching control mechanism - Part 1: General specifications for AC switching control mechanism - Part 1: General specifications for AC switching control mechanism - Part 1: General specifications for AC switching control mechanism - Part 1: General specifications for AC switching control mechanism - Part 1: General specifications for AC switching control mechanism - Part 1: General specifications for AC switching control mechanism - Part 1: General specifications for AC switching control mechanism - Part 1: General specifications for AC switching control mechanism - Part 1: General specifications for AC switching control mechanism - Part 1: General specifications for AC switching control mechanism - Part 1: General specifications for AC switching control mechanism - Part 1: General specifications for AC switching control

Subclause 7.4.4; High-voltage switch mechanism and control mechanism - Part 1: General specifications for alternating current switches control mechanism and mechanism IEC 62271-1-2017 ed. 2.1 Subclause 7.5; High-voltage switch mechanism and control mechanism - Part 1: General specifications for alternating current switches control mechanism and mechanism IEC 62271-1-2017 ed. 2.1 Subclause 7.6; Multifunction balance GX-A and GF-A Subclause 5.1; National standards RF GOST R 51155-2017 Subclause 5.1.4; National standards RF GOST R 51155-2017 Subclause 5.2.1; National standards RF GOST R 51155-2017 Subclause 5.4; National standards RF GOST R 51155-2017 Subclauses 5.2.4, 5.2.6, 5.2.7; National standards RF GOST R 51321.1-2007 (IEC 60439-1:2004) Subclause 8.2.1; National standards RF GOST R 51321.1-2007 (IEC 60439-1:2004) Subclause 8.2.2; National standards RF GOST R 51321.1-2007 (IEC 60439-1:2004) Subclause 8.2.3; National standards RF GOST R 51321.1-2007 (IEC 60439-1:2004) Subclause 8.2.5; National standards RF GOST R 51321.1-2007 (IEC 60439-1:2004) Subclause 8.2.6; National standards RF GOST R 51321.1-2007 (IEC 60439-1:2004) Subclause 8.3.4; National standards RF GOST R 52082-2003 Subclause 8.6.4; National standards RF GOST R 52082-2003 Subclause 8.9.1; National standards RF GOST R 52082-2003 Subclause 8.9.2; National standards RF GOST R 52082-2003 Subclause 8.9.3; National standards RF GOST R 52082-2003 Subclause 8.9.6; National standards RF GOST R 52082-2003 Subclauses 8.8.1-8.8.3, 8.8.5 (dimensions); National standards RF GOST R 52082-2003 Subclauses 8.8.4, 8.8.5; National standards RF GOST R 52287-2004 (IEC 60772-1983) Subclause 6.4.9; National standards RF GOST R 52719-2007 Subclause 10.1 (by measuring tool); National standards RF GOST R 52726-2007 Subclause 8.2; National standards RF GOST R 52726-2007 Subclause 8.3; National standards RF GOST R 54828-2022 Subclause 8.12; National standards RF GOST R 54828-2022 Subclause 8.6; National standards RF GOST R 54828-2022 Subclause 8.8.1; National standards RF GOST R 55025-2012 Subclause 8.3.3; National standards RF GOST R 55025-2012 Subclause 8.3.8; National standards RF GOST R 55025-2012 Subclause 8.3.9; National standards RF GOST R 55187-2012 Subclause 9.1; National standards RF GOST R 55187-2012 Subclause 9.18 (calculation method); National standards RF GOST R 55187-2012 Subclause 9.22; National standards RF GOST R 55187-2012 Subclause 9.4; National standards RF GOST R 55187-2012 Subclause 9.6; National standards RF GOST R 55189-2012 Subclause 8.7.5; National standards RF GOST R 55189-2012 Subclauses 8.4.1- 8.4.7; National standards RF GOST R 55189-2012 Subclauses 8.6.1, 8.6.4 (dimensions); National standards RF GOST R 55189-2012 Subclauses 8.6.2, 8.6.4 (leakage path length); National standards RF GOST R 55189-2012 Subclauses 8.6.3, 8.6.4 (mass); National standards RF GOST R 55190-2022 Subclause 8.3.1; National standards RF GOST R 55190-2022 Subclause 8.4.10; National standards RF GOST R 55190-2022 Subclause 8.4.5.1; National standards RF GOST R 55190-2022 Subclause 8.4.8; National standards RF GOST R 55190-2022 Subclause 8.4.9; National standards RF GOST R 55190-2022 Subclause 8.6; National standards RF GOST R 55190-2022 Subclause 8.7.4; National standards RF GOST R 55190-2022 Subclause 8.7.6; National standards RF GOST R 55190-2022 Subclause 8.9.1; National standards RF GOST R 55190-2022 Subclause 8.9.2; National standards RF GOST R 55190-2022 Subclauses 8.5.1, 8.5.2, 8.5.5 - 8.5.7, 8.5.9 - 8.5.13; National standards RF GOST R 55194-2012 Subclauses 4.1, 4.4; National standards RF GOST R ISO 3746-2013 Appendix A; General insulation strength methods GOST 1516.2 Subclauses 4.1, 4.2, 4.4, 4.5, 7.1-7.4, Clause 8; AC fuses for voltage from 3 kV and above. General specifications GOST 2213-79 Subclause 7.1; AC fuses for voltage of 3 kV and above. General specifications GOST 2213-79 Subclause 7.5; AC fuses for voltage of 3 kV and above. General specifications GOST 2213-79 Subclause7.5 (by amperometer and voltmeter methods); AC disconnecting switches and shortcircuiting switches for voltage greater than 1 kV including their actuators. General specifications GOST R 52726 Subclause 8.13; AC disconnecting switches and earthing switches for voltage

greater than 1 kV, including their actuators. General specifications GOST R 52726 Subclause 8.14; AC disconnecting switches and earthing switches for voltage greater than 1 kV including their actuators. General specifications GOST R 52726 Subclause 8.17; AC disconnecting switches and short-circuiting switches for voltage greater than 1 kV including their actuators. General specifications GOST R 52726 Subclause 8.19; AC disconnecting switches and shortcircuiting switches for voltage greater than 1 kV including their actuators. General specifications GOST R 52726 Subclause 8.8.2; AC disconnecting switches and short-circuiting switches for voltage greater than 1 kV including their actuators. General specifications GOST R 52726 Subclause 8.9; AC disconnecting switches and short-circuiting switches for voltage greater than 1 kV including their actuators. General specifications GOST R 52726 Subclause8.1; AC disconnecting switches and short-circuiting switches for voltage greater than 1 kV including their actuators. General specifications GOST R 52726 Subclauses 8.5.1.1, 8.5.3, 8.5.8; AC disconnecting switches and short-circuiting switches for voltage greater than 1 kV including their actuators. General specifications GOST R 52726 Subclauses 8.5.1.1, 8.5.4, 8.5.8; AC disconnecting switches and short-circuiting switches for voltage greater than 1 kV including their actuators. General specifications GOST R 52726 Subclauses 8.5.1.1, 8.5.5, 8.5.8; AC disconnecting switches and short-circuiting switches for voltage greater than1 kV including their actuators. General specifications GOST R 52726 Subclauses 8.5.1.1, 8.5.6, 8.5.8; AC disconnecting switches and short-circuiting switches for voltage greater than 1 kV including their actuators. General specifications GOST R 52726 Subclauses 8.5.1.1, 8.5.7, 8.5.8; AC disconnecting switches and short-circuiting switches for voltage greater than 1 kV including their actuators. General specifications GOST R 52726 Subclauses 8.5.1.1, 8.6; AC disconnecting switches and short-circuiting switches for voltage greater than 1 kV including their actuators. General specifications GOST R 52726-2007 Subclause 8.7; Current-limiting reactor GOST 14794-79 Subclause 6.12; Operation manual VR41.00.000RE Subclause 2.4.1; IEC standards High-voltage switchgear and controlgear - Part 37-013: Alternating current generator circuitbreakers IEC/IEEE 62271-37-013 ed. 2.0 Subclause 7.6; IEC standards High-voltage switchgear and controlgear - Part 37-013: Alternating current generator circuit-breakers IEC/IEEE 62271-37-013 ed. 2.0 Subclauses 7.103, 7.104, 7.105; IEC standards IEC 60060-1(2010) ed. 3.0 Clauses 4, 6; IEC standards IEC 60076-1(2011) Subclause 11.2; IEC standards IEC 60137(2017) Subclause 8.14; IEC standards IEC 60137(2017) Subclause 8.8; IEC standards IEC 60137(2017) Subclause 9.2; IEC standards IEC 60214-1(2014) Subclause 7.2.3; IEC standards IEC 61869-2(2012) Subclause 7.2.2; IEC standards IEC 61869-2(2012) Subclause 7.3.1; IEC standards IEC 61869-2(2012) Subclause 7.4.3; IEC standards IEC 61869-2(2012) Subclauses 7.2.6, 7.3.5; IEC standards IEC 61869-3(2011) ed.1 Subclause 7.3.1; IEC standards IEC 61869-3(2011) ed.1 Subclause 7.4.3; IEC standards IEC 62271-100 ed. 2.1 Subclauses 7.102, 7.103, 7.104, 7.105, 7.106, 7.107, 7.108, 7.109, 7.110, 7.111; IEC standards IEC 62271-101 ed. 3.0 Subclauses 7.102, 7.104, 7.107, 7.108.2, 7.109, 7.110, 7.111; IEC standards Power transformers - Part 11: Dry-type transformers IEC 60076-11 ed. 2.0 Subclause 14.4.4; TRANSFORMERS (POWER AND VOLTAGE) AND REACTORS Electrical insulation strength method GOST 22756-77 Subclauses 2.7, 2.10, 3.3; Instrument transformers. Part 1. General requirements IEC 61869-1:2007 Subclause 7.4.3; Instrument transformers. Part 1. General requirements IEC 61869-1:2007 Subclause 7.4.5; Instrument transformers. Part 1. General requirements EC 61869-1:2007 Subclause 7.2.7.1; Instrument transformers. Part 1. General requirements IEC 61869-1:2007 Subclause 7.2.7.1; Instrument transformers. Part 1. General requirements IEC 61869-1:2007 Subclause 7.3.1, 7.3.3, 7.3.4; Instrument transformers. Part 2. Specific requirements for current transformers IEC 61869-2(2012) Subclause 7.2.201 (Resistance to rated short-time thermal current /dynamic withstand); Instrument transformers. Part 2. Specific requirements for current transformers IEC 61869-2(2012) Subclause 7.2.201 (Resistance to rated short-time thermal current /thermal resistance); Instrument transformers. Part 2. Specific requirements for current transformers IEC 61869-2(2012) Subclause 7.3.203; Instrument transformers. Part 3. Specific requirements for inductive voltage converters IEC 61869-3(2011) ed.1 Subclauses 7.2.6, 7.3.5; Voltage transformers. General specifications GOST 1983-2015 Subclause 9.1.1; Voltage transformers. General specifications GOST 1983-2015 Subclause 9.13; Voltage transformers. General specifications GOST 1983-2015 Subclause 9.14; Voltage transformers. General specifications GOST 1983-2015 Subclause 9.3; Voltage transformers. General specifications GOST 1983-2015 Subclause 9.6; Voltage transformers. General specifications GOST 1983-2015

Subclauses 9.1.1, 9.1.2; Voltage transformers. General specifications GOST 1983-2015 Subclauses 9.1.1, 9.1.3; Power transformers and reactors. Frequency-response measurement method GOST R 59239-2020 (IEC 60076-18:2012) Clause 5; Power transformers. General specifications GOST R 52719 Subclause 10.5; Power transformers. General specifications GOST R 52719 Subclause 10.1 (visually); Power transformers. Part 1. General provisions IEC 60076-1(2011) Appendix E; Power transformers. Part 18. Frequency-response measurements IEC 60076-18(2012) Clause 4; Power transformers. Part 3. Insulation levels, dielectrical breakdown tests and outside air clearances IEC 60076-3(2013) Clause 10; Power transformers. Part 3. Insulation levels, dielectrical breakdown tests and outside air clearances IEC 60076-3(2013) Clause 12: Power transformers. Part 3. Insulation levels, dielectrical breakdown tests and outside air clearances IEC 60076-3(2013) Clause 14; Power transformers. Part 5. Shortcircuit strength IEC 60076-5(2006) Clause 4; Dry-type transformers GOST R 54827-2011 Subclause 26.3; Dry-type transformers GOST R 54827-2011 Subclauses 27.3, 27.4; Current transformers. General specifications GOST 7746 Subclause 9.1; Current transformers. General specifications GOST 7746 Subclause 9.10; Current transformers. General specifications GOST 7746 Subclause 9.2.1; Current transformers. General specifications GOST 7746 Subclause 9.2.3; Current transformers. General specifications GOST 7746 Subclause 9.2.6; Current transformers. General specifications GOST 7746 Subclause 9.2.7; Current transformers. General specifications GOST 7746 Subclause 9.3; Current transformers. General specifications GOST 7746 Subclause 9.5.1.1; Current transformers. General specifications GOST 7746 Subclause 9.6; Current transformers. General specifications GOST 7746 Subclause 9.7; Current transformers. General specifications GOST 7746 Subclause 9.8; Current transformers. General specifications GOST 7746 Subclause 9.9; Voltage indicating devices. General specifications GOST 20493-2001 Subclause 8.10.8, 8.10.9; Voltage indicating devices. General specifications GOST 20493-2001 Subclauses 8.4, 8.5, 8.9.5; Voltage indicating devices. General specifications GOST 20493-2001 Subclauses 8.9.2, 8.10.3; Voltage indicating devices. General specifications GOST 20493-2001 Subclauses 8.9.2, 8.8; Voltage indicating devices. General specifications GOST 20493-2001 Subclauses 8.4, 8.5, 8.10.5; Voltage indicating devices. General specifications GOST 20493-2001 Subclauses 8.4, 8.5, 8.10.6; Low-voltage switchgear and control devices. Part 1. General requirements GOST IEC 61439-1-2013 Subclause 10.13; Sulphur hexafluoride-insulated metalenclosed switchgear for rated voltages from 110 kV and above. General specifications GOST R 54828-2022 8.10.3; Sulphur hexafluoride-insulated metal-enclosed switchgears for rated voltages from 110 kV and above. General specifications GOST R 54828-2022 8.9.1; Metalenclosed switchgears for rated voltage up to 35 kV. General specifications GOST R 55190 Subclause 8.11; Metal-enclosed switchgear for rated voltage up to 35 kV. General specifications GOST R 55190 Subclause 8.3.2.1; Metal-enclosed switchgear for rated voltage up to 35 kV. General specifications GOST R 55190 Subclause 8.3.2.2; Metal-enclosed switchgear for rated voltage up to 35 kV. General specifications GOST R 55190 Subclause 8.3.2.3; Metal-enclosed switchgear for voltage up to 10 kV. Test methods GOST 14694 Subclause 3.1.8; Metal-enclosed switchgear for voltage up to 10 kV. Test methods GOST 14694 Subclause 4.2; Metal-enclosed switchgear for voltage up to 10 kV. Test methods GOST 14694 Subclause 4.3; Metal-enclosed switchgear for voltage up to 10 kV. Test methods GOST 14694 Subclause 4.4; Metal-enclosed switchgear for voltage up to 10 kV. Test methods GOST 14694 Subclause 4.5; Metal-enclosed switchgear for voltage up to 10 kV. Test methods GOST 14694 Subclauses 3.1.1; 3.2 - 3.9; Metal-enclosed switchgear for voltage up to 10 kV. Test methods GOST 14694 Subclauses 3.1.2 - 3.1.7; Metal-enclosed switchgear for voltage up to 10 kV. Test methods GOST 14694-76 Clause 12; Metal-enclosed switchgear for voltage up to 10 kV. Test methods GOST 14694-76 Subclause 6.4; Metal-enclosed switchgear for voltage up to 10 kV. Test methods GOST 14694-76 Subclauses 4.6, 4.7; Control electromagnets. General specifications GOST 19264-82 Subclause 7.5; Control electromagnets. General specifications GOST 19264-82 Subclause 7.6; AC electrical equipment and installations for voltages from 1 to 750 kV. General insulation strength methods GOST R 55194-2012 Clause 7 (Insulation strength of auxiliary circuits); AC electrical equipment and installations for voltages from 1 to 750 kV. General insulation strength methods GOST R 55194-2012 Clause 7 (Insulation strength in one-minute voltage test); AC electrical equipment and installations for voltages from 1 to 750 kV. General insulation strength methods GOST R 55194-2012 Clause 7 (Insulation strength in AC smooth-rise voltage test); AC Electrical equipment and installations for voltages from 1 to 750 kV. General insulation strength methods GOST R 55194-2012 Clause 8; Electrical equipment and installations. Partial discharge measurement method GOST 20074-83 Clauses 1 - 5; winding changeover devices GOST 8008 Subclause 14.3, 14.4; winding changeover devices GOST 8008-75 Subclause 14.2, 14.5; winding changeover devices GOST 8008-75 Subclause 14.3, 14.7; winding changeover devices GOST 8008-75 Subclause 4 (by microhmmeter); winding changeover devices GOST 8008-75 Subclause 9; winding changeover devices; GOST 8008-75 Subclause 14.2, 14.6 Name of test object

002.001.11 Insulators for electrified railway overhead; 002.015 Insulators for electrified railway overhead; 003.001.11 Insulators for electrified railway overhead; 003.009 Insulators for electrified railway overhead; 3185.1 Insulators for electrified railway overhead; 3414.14 Capacitors and capacitor units; null Power circuit-breakers; null Power cables with plastic and paper insulation for stationary cable laying for voltage greater than 1 kV (through to 35 kV); null Single-end service assembled chambers; null Switchgears; null Sulphur hexafluoride switchgears; null Packaged transformer substations; null Capacitors and capacitor units; null Single suppressors; null Disconnecting switches and earthing switches, isolating switches and short-circuiting switches; null Voltage transformers; null Power transformers; null Current transformers

Accreditation Scope Expansion of accreditation scope PK1RA-139 of March 20, 2025 Confirmation of competence PK1RA-139 of March 20, 2025 Show archive Confirmation of competence PK1RA-139 of March 20, 2025

- <u>W/O CONFIGURATOR</u>
- <u>W/CONFIGURATOR</u>

Testing Laboratory Signatures information

111250, RUSSIA, Moscow, Krasnokazarmennaya street, 12, bld. 3 111250, RUSSIA, Moscow, Krasnokazarmennaya street, 12, bld. 8 111250, RUSSIA, Moscow, Krasnokazarmennaya street, 12, bld. 7 Product testing

Note

Electrical switchgear and regulating equipment; Electrical switchgear and regulating equipment; Pipeline accessories (accessories) (taps, valves and others); Batteries and accumulators; Ferrousmetal drums and similar vessels; Power circuit-breakers; AC high-voltage circuit-breakers, contactors and reversers (high-voltage power circuit-breakers); AC high-voltage circuit-breakers, contactors and reversers (high-voltage power circuit-breakers); Wiring products; Fiber optic cables; Switchgears; Switchgears; Sulphur hexafluoride-insulated switchgears; Packaged transformer substations; Other components and accessories for motor vehicles; Electrical switchgear or protective equipment packages; Electrical switchgear or protective equipment packages; Electronic components; Computers and peripheral equipment; Other end metal products, not elsewhere classified; Metal structures and their sections; Other pumps and compressors; Magnetic and optical storage media; Hydraulic and pneumatic power equipment; Measurement, testing and navigation equipment; Communication equipment; Electrical and electronic equipment for motor vehicles; Electrical lighting equipment; Other Electrical equipment; Other Electrical equipment; Weapon and munitions; Loaded printed boards; Bearings, wheel gears, trains of gears and actuating members; Other electronic and electrical leads and cables; Other electronic and electrical leads and cables; Disconnecting switches, shortcircuiting switches, isolators, AC high-voltage earthing switches (AC disconnecting switches and earthing switches for voltage greater than 1 kV of power-frequency 50 Hz, including their actuators); Other metal reservoirs, tanks and similar vessels; Motor vehicles; Light-weight metal packs; Consumer electronics; Voltage transformers; Other transformers of power no greater than 16 kVA; Current transformers; Electrical transformers; Electrical switchgear or protective equipment for voltage greater than 1 kV; Electrical circuit switchgear or protective eqipment for voltage not greater than 1 kV; Sections of electrical switchgear or regulating equipment; Electrical motors, generators and transformers; Electrical motors, generators and transformers Code TN VED (EAES)

8504 Electrical transformers, static electrical converters (for example, rectifiers), inductance coils and throttles:; 850431 – of power no greater than 1 kVA:; 8504320002 - - - instrument transformers; 8535 Electrical switchgear or protective equipment or equipment for connection to electrical circuits or in electrical circuits (for example, circuit-breakers, switchgears, interrupters, fuses, lightning rods, voltage suppressors, step voltage suppressors, pantagraphs, current collectors and other connectors, connection boxes) for voltage greater than 1000 V:; 853530 - disconnecting switches and interrupters:; 8536 Electrical switchgear or protective equipment or equipment for connection to electrical circuits or in electrical circuits (for example, circuit-breakers, switchgears, interrupters; 8536 Electrical switchgear or protective equipment or equipment for connection to electrical circuits or in electrical circuits (for example, circuit-breakers, switchgears, interrupters, fuses, step voltage suppressors, male plugs and plug-in sockets, electrical lamp holders and other connectors, connection boxes) for voltage no greater than 1000 V; connectors for fibers of optical, fiber optical bundles or cables:; 8537 Other desk units, panels, consoles, tables, switchboard panels and Electrical equipment bases, equipped by two or more devices of product item 8535 or 8536, for electrical-current control or distribution,

including group 90 instruments or devices and digital control switches, except for switchgears of product item 8517:; 853720 – for voltage greater than 1000 V:; 8546 Electrical insulators made of different materials:

Measurement type/method

Environmental testing High operating ambient temperature testing; Environmental testing Low operating ambient temperature testing; Environmental testing Other environmental investigation (testing) methods; Reliability, service-life testing; other reliability, service-life investigation (testing) methods; Non-destructive testing visual inspection and measurements; Physical and mechanical measurement of physical quantities; Other physical and mechanical investigation (testing) methods to determine physical and mechanical parameters; Functional testing of construction systems and elements Functional testing of construction systems and elements; Electrophysical investigation (tests) Electrophysical investigation (testing) methods, not expressly specifying

Calculated rates/ measured range

Absolute angular error measured range from -600 to +600 min; Absolute angular error measured range from 0,01 to 100 %; Interchangeability of identic replacement components measured range passed/failed; Air humidity measured range from 10 to 98 %; Humidity measured range from 25 to 100 %; Humidity measured range from 60 to 98 %; Test humidity measured range from 40 to 98 %; Exterior measured range compliant/noncompliant; Exposure to wind, glaze-ice, and leads tension measured range passed/failed; Holding time measured range from 0 to 60 s; Time measured range from 0 to 1000 s; Time measured range from 0.001 to 5.2 s; Time measured range from 10⁻⁴ to 10 s; Withstand power-frequency voltage measured range from 0 to 10 kV; Overall and connecting dimensions measured range from 0 to 15000 mm; Overall dimensions measured range from 0 to 15000 mm; Pressure measured range from 0 to 0.9 MPa; Actuating pressure measured range from 0 to 0.9 MPa; Locking device operation / Electrical locking device operation / Electrical locking device operation measured range passed/failed; Impulse withstand voltage measured range from 0 to 20 kV; Locking device operability measured range passed/failed; Mechanism operability measured range passed/failed; Mechanism operability measured range passed/failed; Test force measured range from 0 to 1 kN; Test force measured range from 0 to 10 kN; test voltage measured range from 0 to 100 kV; Test voltage measured range from 0 to 1000 V; Test voltage measured range from 0 to 230 kV; Test voltage measured range from 0 to 500 V; Test current measured range from 0 to 5000 A; Test current measured range from 0.0001 to 100 A; Completeness measured range compliant/noncompliant; Contact pressure measured range from 0 to 5 kN; Contact pressure measured range from 50 to 500 N; Controlled PTS assembly measured range passed/failed; Marking measured range compliant/noncompliant; Marking and branding measured range confirmed/not confirmed; Marking and branding measured range compliant/noncompliant; Mass measured range from 0 to 5000 kg; Mass measured range compliant/noncompliant from 0 to 5000 kg; Mechanical wearresistance measured range passed/failed; Mechanical load measured range passed/failed from 0 to 1 kN; Mechanical load measured range from 0 to 1 kN; Mechanical strength of switchgear structural elements in multiple operations measured range passed/failed; mechanical strength of switchgear structural elements in multiple operations measured range passed/failed; Mechanical operability measured range passed/failed; Mechanical resistance measured range passed/failed; Availability of nameplate with data specified by normative documents measured range compliant/noncompliant; Power voltage measured range from 0 to 500 V; Power voltage measured range from 0 to 690 V; Actuation voltage measured range from 0 to 1000 V; Pressure continuity of sliding earthing contacts measured range passed/failed; Operation in glaze-ice conditions measured range passed/failed; Operation under rated static mechanical load to terminals measured range passed/failed; Making and breaking test of main circuit switchgear and actuators measured range passed/failed; Relative current error measured range from -600 to +600 min; Relative current error measured range from 0.01 to 100 %; AC voltage measured range from 0.1 to 100 kV; Displacement measured range from 0 to 100 mm; Displacement measured range from 1 to 900 mm; Winding polarity measured range compliant/noncompliant; Correctness of contact clamps and terminals identification measured range compliant/noncompliant; Proper arrangement of operative control, protection, automatic and alarm circuits measured range compliant/noncompliant; Correctness of nameplates; Correctness of marking measured range

compliant/noncompliant; Correctness of marking and branding measured range compliant/noncompliant; Correctness of adjustment measured range compliant/noncompliant; Switchgear operation test measured range passed/failed; Auxiliary contact operation measured range passed/failed; Operability of locking devices measured range passed/failed; Operability measured range passed/failed; Operability of mechanical parts measured range passed/failed; Operability when exposed to glaze-ice measured range passed/failed; Operability of instruments, gears, and diagrams of auxiliary circuits measured range passed/failed; Overall dimensions range from 0 to 15000 mm; Overall dimensions measured measured range compliant/noncompliant from 0 to 15000 mm; Force measured range from 0 to 1 kN; Force measured range from 0 to 1 kN; Force measured range from 0.1 to 10 kN; Rate Calculated rate measured range; Switchgear contact movement rate in making and braking operations. Calculated rate measured range compliant/noncompliant; Closing time measured range from $0.2*10^{-3}$ to 5.2 s; Closing time measured range compliant/noncompliant from 10^{-4} to 10 s; Opening time measured range from 0 to 100 s; Opening time measured range from $0.2*10^{-3}$ to 5.2 s; Opening time measured range compliant/noncompliant from 10⁻⁴ to 10 s; Compliance to design drawings measured range compliant/noncompliant; Compliance to technical documentation requirements measured range compliant/noncompliant; Insulation resistance measured range from 3*10³ to 1000*10⁶ Ohm; Windings insulation resistance measured range passed/failed from 3*10³ to 1000*10⁹ Ohm; Winding insulation resistance measured range from 0 to 1000 GOhm; DC resistance measured range compliant/noncompliant from 10⁻⁶ to 1999.9 Ohm; Protective coating condition measured range passed/failed; Protective coating condition measured range compliant/noncompliant; Protective coating condition measured range passed/failed; Surface condition measured range passed/failed; Surface condition measured range compliant/noncompliant; Surface condition of external measured range passed/failed; Degree of protection from external solid objects measured range passed/failed from 1 to 4 null; Degree of water protection designated by the second characteristic digit measured range from 3 to 5 null; Degree of protection from access to hazardous parts measured range passed/failed from 1 to 4 null; Degree of protection from access to hazardous parts measured range passed/failed from A to D null; Mark permanency measured range passed/failed; Temperature measured range from +20 to +60 °C; Temperature measured range from -20 to -7 °C; Temperature measured range from -25 to 5 °C; Temperature measured range from -70 to 0 °C; Temperature measured range from -75 to +130 °C; Temperature measured range from -75 to +135 °C; Temperature measured range from -75 to 130 °C; Test temperature measured range from 0 to 50 °C; Technical documentation measured range compliant/noncompliant; Current measured range from 0.0001 to 100 A; Useful current measured range from 0 to 100 A; Thickness measured range from 0 to 20 mm; Thickness measured range from 0 to 30 mm; Ice crust thickness measured range from 0 to 20 mm; Force measured range from 0 to 1 kN; Force on withdrawable element transfer control handle measured range from 0 to 1 kN; Humidity resistance measured range passed/failed; Resistance to climatic factors measured range passed/failed; Rain crust resistance measured range passed/failed; Temperature resistance measured range passed/failed; Temperature resistance measured range passed/failed from -70 to +130 °C; Temperature and humidity resistance measured range passed/failed; Fixing devices measured range passed/failed; Operation of cabinet and withdrawable parts mechanisms measured range passed/failed; Insulation strength PTS in dew-fall conditions measured range passed/failed; Insulation strength measured range passed/failed; Electrical resistance measured range from 0.000001 to 199.9 Ohm; Electrical resistance measured range from 1 to 1000 µOhm; Electrical insulation properties /Insulation strength measured range passed/failed; frost effect with its subsequent melting measured range passed/failed

Procedure

Test methods for resistance to climatic ambient factors of machines; instruments, and other technical products. Air humidity tests GOST R 51369-99 Clause 4; methods 207-1, 207-2, 207-3, 207-4, 207-5; Test methods for resistance to climatic ambient factors of machines; instruments, and other technical products. Air humidity tests GOST R 51369-99 Clause 5; methods 208-1, 208-2; AC circuit-breakers for voltages from 3 to 750 kV. General specifications GOST R 52565-2006 Subclauses 9.10.2.1, 9.10.2.2, 9.10.2.3, 9.10.4, 9.10.5; Electrical products. Test methods for resistance to climatic ambient factors GOST 16962.1-89 Subclause 2.14 (test 222); Low-voltage switchgears and control devices. Part 1. General requirements GOST IEC

61439-1-2013 Subclause 10.9; AC circuit-breakers for voltages from 3 to 750 kV. General specifications GOST R 52565-2006 Subclause 9.2.1.2, 9.2.2.4; AC circuit-breakers for voltages from 3 to 750 kV. General specifications GOST R 52565-2006 Subclause 9.2.1.2, 9.2.2.5; AC circuit-breakers for voltages from 3 to 750 kV. General specifications GOST R 52565-2006 Subclause 9.2.1.2, 9.2.2.6; AC circuit-breakers for voltages from 3 to 750 kV. General specifications GOST R 52565-2006 Subclause 9.2.1.2, 9.2.2.8; AC circuit-breakers for voltages from 3 to 750 kV. General specifications GOST R 52565-2006 Subclause 9.2.1.2, 9.2.4; AC circuit-breakers for voltages from 3 to 750 kV. General specifications GOST R 52565-2006 Subclause 9.2.1.2, 9.2.5; AC circuit-breakers for voltages from 3 to 750 kV. General specifications GOST R 52565-2006 Subclause 9.2.1.2, 9.2.6; AC circuit-breakers for voltages from 3 to 750 kV. General specifications GOST R 52565-2006 Subclause 9.1 (visually); AC circuit-breakers for voltages from 3 to 750 kV. General specifications GOST R 52565-2006 Subclause 9.1 (by general-purpose balance); AC circuit-breakers for voltages from 3 to 750 kV. General specifications GOST R 52565-2006 Subclause 9.1 (by universal measuring tool); AC circuit-breakers for voltages from 3 to 750 kV. General specifications GOST R 52565-2006 Subclause 9.2.1.2; AC circuit-breakers for voltages from 3 to 750 kV. General specifications GOST R 52565-2006 Subclause 9.2.1.2, 9.2.2.3; AC circuit-breakers for voltages from 3 to 750 kV. General specifications GOST R 52565-2006 Subclauses 9.2.1.2, 9.2.2.9; AC circuit-breakers for voltages from 3 to 750 kV. General specifications GOST R 52565-2006 Subclause 9.2.1.2, 9.2.3; AC circuit-breakers for voltages from 3 to 750 kV. General specifications GOST R 52565-2006 Subclause 9.2.2.2; State System for Ensuring Uniform Measurements. Current transformers. Check-out procedure GOST 8.217 Subclause 9.4; TEST METHODS FOR RESISTANCE TO CLIMATIC AMBIENT FACTORS OF MACHINES; INSTRUMENTS, AND OTHER TECHNICAL PRODUCTS GOST 30630.0.0 Clauses 4, 7, Subclauses 8.1 – 8.9; Interstate standards, accepted as RF National standards GOST 14254-2015 (IEC 60529:2013) Clause 12; Interstate standards, accepted as RF National standards GOST 14254-2015 (IEC 60529:2013) Clause 13; Interstate standards, accepted as RF National standards GOST 14254-2015 (IEC 60529:2013) Clause 14; Interstate standards, accepted as RF National standards GOST 14254-2015 (IEC 60529:2013) Clause 15; Interstate standards, accepted as RF National standards GOST 14694-76 Subclause 1.1; Interstate standards, accepted as RF National standards GOST 14694-76 Subclause 1.5; Interstate standards, accepted as RF National standards GOST 14694-76 Subclause 4.10.2; Interstate standards, accepted as RF National standards GOST 14694-76 Subclause 4.3; Interstate standards, accepted as RF National standards GOST 14694-76 Subclause 4.4; Interstate standards, accepted as RF National standards GOST 14694-76 Subclause 4.9; Interstate standards, accepted as RF National standards GOST 14694-76 Subclauses 4.10.1, 4.10.3; Interstate standards, accepted as RF National standards GOST 14694-76 Subclauses 4.5.1, 4.5.4, 4.5.5; Interstate standards, accepted as RF National standards GOST 14694-76 Subclauses 4.5.2, 4.5.3, 4.5.4, 4.5.5; Interstate standards, accepted as RF National standards GOST 14694-76 Subclauses 5.1, 5.2; Interstate standards, accepted as RF National standards GOST 1516.2-97 Subclauses 4.1, 4.2, 4.4, 4.5, 7.1-7.5, 7.7; Interstate standards, accepted as RF National standards GOST 1983-2015 Subclause 9.1; Interstate standards, accepted as RF National standards GOST 1983-2015 Subclause 9.13; Interstate standards, accepted as RF National standards GOST 1983-2015 Subclause 9.3; Interstate standards, accepted as RF National standards GOST 20248-82 Clause 1; Interstate standards, accepted as RF National standards GOST 20248-82 Clause 4; Interstate standards, accepted as RF National standards GOST 20248-82 Subclauses 13.1, 13.2, 13.4 - 13.6; Interstate standards, accepted as RF National standards GOST 20248-82 Subclauses 13.3, 13.6; Interstate standards, accepted as RF National standards GOST 7746-2015 Subclause 9.1; Interstate standards, accepted as RF National standards GOST 7746-2015 Subclause 9.3; Interstate standards, accepted as RF National standards GOST 7746-2015 Subclause 9.5; Interstate standards, accepted as RF National standards GOST 8.217-2003 Subclause 9.2; Interstate standards, accepted as RF National standards GOST 8.217-2003 Subclauses 9.3, 9.5; Interstate standards, accepted as RF National standards GOST IEC 61439-1-2013 Subclause 10.13; Interstate standards, accepted as RF National standards GOST IEC 61439-1-2013 Subclause 10.2.7; Test methods for resistance to climatic ambient factors of machines, instruments, and other technical products. Air humidity tests GOST R 51369-99 Clause 7; method 206-1 (test for resistance to frost with its subsequent melting); Test methods for resistance to climatic ambient

factors of machines, instruments, and other technical products. Air humidity tests GOST R 51369-99 Clause 8; method 222-1 (Test for operability when exposed to glaze-ice); Test methods for resistance to climatic ambient factors of machines, instruments, and other technical products. Temperature resistance test GOST 30630.2.1-2013 Clause 4; methods 201-1.1, 201-1.2, 201-2.1.1, 201-2.1.2, 201-2.3.1, 201-2.3.2; Test methods for resistance to climatic ambient factors of machines, instruments, and other technical products. Temperature resistance test GOST 30630.2.1-2013 Clause 5; method 202-1; Test methods for resistance to climatic ambient factors of machines, instruments, and other technical products. Temperature resistance test GOST 30630.2.1-2013 Clause 6; methods 203-1, 203-2.1, 203-2.2; Test methods for resistance to climatic ambient factors of machines, instruments, and other technical products. Temperature resistance test GOST 30630.2.1-2013 Clause 7; method 204-1; Test methods for resistance to climatic ambient factors of machines, instruments, and other technical products. Temperature resistance test GOST 30630.2.1-2013 Clause 8; methods 205-1.1, 205-2; National standards RF GOST R 52726-2007 Subclause 8.3; RF National standards GOST R 55194-2012 Subclauses 4.1, 4.4, Clause 7; RF National standards GOST R IEC 60068-2-1-2009 Clauses 4, 5, 6, 8; RF National standards GOST R IEC 60068-2-2-2009 Clauses 4, 5, 6, 8; Packaged transformer substations of power from 25 to 2500 kV·A for voltage up to 10 kV. Test methods GOST 20248 Clause 5; Packaged transformer substations of power from 25 to 2500 kV·A for voltage up to 10 kV. Test methods GOST 20248 Clause 6; Packaged transformer substations of power from 25 to 2500 kV·A for voltage up to 10 kV. Test methods GOST 20248 Clause 7; Packaged transformer substations of power from 25 to 2500 kV·A for voltage up to 10 kV. Test methods GOST 20248 Subclause 8.4; Disconnecting switches and AC earthing switches for voltage greater than 1 kV including their actuators. General specifications GOST R 52726 Subclause 8.19; Disconnecting switches and AC earthing switches for voltage greater than 1 kV, including their actuators. General specifications GOST R 52726 Subclause 8.6; Disconnecting switches and AC earthing switches for voltage greater than 1 kV including their actuators. General specifications GOST R 52726 Subclause 8.1; Disconnecting switches and AC earthing switches for voltage greater than 1 kV including their actuators. General specifications GOST R 52726 Subclauses 8.5.1.1, 8.5.3, 8.5.8; Disconnecting switches and AC earthing switches for voltage greater than 1 kV including their actuators. General specifications GOST R 52726 Subclauses 8.5.1.1, 8.5.4, 8.5.8; Disconnecting switches and AC earthing switches for voltage greater than 1 kV, including their actuators. General specifications GOST R 52726 Subclauses 8.5.1.1, 8.5.5, 8.5.8; Disconnecting switches and AC earthing switches for voltage greater than 1 kV, including their actuators. General specifications GOST R 52726 Subclauses 8.5.1.1, 8.5.6, 8.5.8; Disconnecting switches and AC earthing switches for voltage greater than 1 kV, including their actuators. General specifications GOST R 52726 Subclauses 8.5.1.1, 8.5.7, 8.5.8; Disconnecting switches and AC earthing switches for voltage greater than 1 kV, including their actuators. General specifications GOST R 52726-2007 Subclause 8.7; Voltage transformers. General specifications GOST 1983 Subclause 9.13; Current transformers. General specifications GOST 7746 Subclause 9.5.1.1; Metal-enclosed switchgear for voltage up to 10 kV. Test methods GOST 14694 Subclause 4.6; Metal-enclosed switchgear for voltage up to 10 kV. Test methods GOST 14694 Subclause 4.7; Metal-enclosed switchgear for voltage up to 10 kV. Test methods GOST 14694 Subclause 4.8

Name of test object

null Power circuit-breakers; null Switchgears; null Sulfur-hexafluoride switchgears; null Packaged transformer substations; null Voltage transformers; null Current transformers

SCOPE OF ACCREDITATION

Extension of accreditation scope PK1RA-139 of March 20, 2025 **Confirmation of competence** PK1RA-139 of March 20, 2025 Show archive **Confirmation of competence PK1RA-139 of March 20, 2025**

- W/O CONFIGURATOR
- W/CONFIGURATOR

Testing Laboratory Signatures information

111250, RUSSIA, Moscow, Krasnokazarmennaya street, 12, bld. 3 111250, RUSSIA, Moscow, Krasnokazarmennaya street, 12, bld. 8 111250, RUSSIA, Moscow, Krasnokazarmennaya street, 12, bld. 7 Product testing

Note

Electrical accumulators and their parts; Switchgear and regulating Electrical equipment; Other Electrical switchgear to control electrotechnical installations, not elsewhere classified; Electrical switchgear to control electrotechnical installations, except for electromagnetic contactors and actuators, control and protective relays; Electrical switchgear to control electrotechnical installations, except for electromagnetic contactors and actuators, control and protective relays; Cable accessories; Pipeline accessories (accessories) (taps, valves, and others); Plastic Electrically insulating accessories; Plastic Electrically insulating accessories; Plastic Electrically insulating accessories (OPERATIVE INSULATING RODS AND TEMPORARY EARTH RODS); Batteries and accumulators; Ferrous-metal drums and similar vessels; Distilled water; Power circuit-breakers; AC high-voltage circuit-breakers, contactors and reversers (high-voltage power circuit-breakers); High-speed railway transport and high-speed railway transport infrastructure; Railway rolling stock and its sections; Other vulcanized rubber products, not elsewhere classified; hard rubber in all forms and products thereof; porous vulcanized rubber flooring and matting; other vulcanized rubber products, not elsewhere classified; hard rubber in all forms and products thereof; porous vulcanized rubber flooring and matting; Wiring products; Insulators for electrified railway overhead; Insulators for electrified railway overhead; Electrical insulators; Electrical insulators; Ceramic Electrical insulators; Insulating accessories for Electrical equipment and ceramic devices; Ceramic Electrical insulators; insulating accessories for Electrical equipment and ceramic devices; Glass Electrical insulators; Glass Electrical insulators; Electrical insulators; insulating accessories for Electrical machines and equipment; electrical pipes; Electrical instruments for soft and hard soldering and welding, machines and apparatus for surface heat treatment and thermal spraying; Railway transport infrastructure; Fiber optic cables; Plastic and paper isolated power cables for stationary cable laying for voltage greater than 1 kV (through 35 kV); Single-end service assembled chambers; Control buttons, button control stations, stations, switchgears; Accumulator switches, master controllers, controllers, drum switches, hand-operated starters, different switches; Switchgears; Sulphur hexafluoride-insulated switchgears; Packaged transformer substations; Packaged transformer substations; Other components and accessories for motor vehicles; Electrical switchgear or protective equipment packages; Electrical switchgear or protective equipment packages; Electronic components; Computers and peripheral equipment; Capacitors and capacitor units; Variable or control capacitors (presettable); Fixed capacitors for 50/60 Hz circuits, for reactive power no less than 0.5 kVAr; Other fixed capacitors; Electrical capacitors; Electromagnetic contactors; Electrical filament lamps or gas-discharge lamps; arc lamps; LED lamps; Electrical insulating oils; Other end metal products, not elsewhere classified; Metal structures and their sections; Electromagnetic couplings, electromagnets, electromagnetic taps, ODA coils, units, locks, electromagnetic keys; Other pumps and compressors; Magnetic and optical data storage media; Nonelectrical appliances for food preparation and heating; Hydraulic and pneumatic power equipment; Measurement, test and navigation equipment; Communication equipment;

Electrical and electronic equipment for motor vehicles; Electrical lighting equipment; Other Electrical equipment; Other Electrical equipment and its components; Other Electrical equipment, not elsewhere classified (including Electrical magnets; electromagnetic boxes and brakes; electromagnetic lifting clamps; Electrical particle accelerators; Electrical signal generators); Weapon and munitions; Panels and other electrical switchgear and protective equipment for voltage not greater than 1 kV; Panels and other electrical switchgear and protective equipment for voltage not greater than 1 kV; Liquid-crystalline or light-emitting diode indicative plates; Electrical equipment of audio or light alarm; Loaded printed boards, Bearings, wheel gears, gear units and actuating members; High voltage fuses; Nonelectrical appliances; Electrical appliances; Other electrical appliances, not elsewhere classified; Other electronic and electrical leads and cables; Other electrical conductors for voltage no greater than 1 kV; Other electrical conductors for voltage no greater than 1 kV; Electromagnetic starters; High-voltage dischargers; Dischargers, Overvoltage suppressors; Disconnecting switches and earthing switches, isolating switches, and short-circuiting switches; AC high-voltage disconnecting switches, short-circuiting switches, isolating switches, earthing switches; AC high-voltage disconnecting switches, short-circuiting switches, isolating switches, earthing switches; Plug connectors and plug-in circuits; Plug connectors, plug-in sockets and other Electrical switchgear or protective equipment, not elsewhere classified; Reactors for electrified railroad substations; Reactors for electrified railroad substations; Reactors, including concrete current-limiting reactors; Reactors, including concrete current-limiting reactors; Other metal reservoirs, tanks and similar vessels; Resistors, except for heating resistors; Decision of Customs Union Commission of July 15, 2011 No 710 (TR TS 001/2011, TR TS 002/2011TR TS 003/2011) (revision of October 30, 2018); Lamps and lighting facilities; Other lamps and lighting facilities; Electrical couplers, contact clamps, sets of clamps; Motor vehicles; Light-weight metal packs; Consumer electronics; Voltage transformers; Other transformers of power greater than 16 kVA; Other transformers of power greater than 16 kVA; Other transformers of power no greater than 16 kVA; Other transformers of power no greater than 16 kVA; Liquid-filled transformers; Liquidfilled transformers; Power transformers; Power transformers; Current transformers; Electrical transformers; Electrical transformers; Electrical transformers (Power transformers (auto-type transformers), line regulating transformers, shunt, current-limiting and arc-suppression reactors); Electrical transformers (General-purpose dry transformers, including autotransformers; auxiliary station transformers, and transformers for packaged transformer substations (PTS) for voltage classes through to 35 kV; Electrical transformers (Power transformers); Magnetic amplifiers and controlled throttles; Electrical generator plants and rotating converters; Electrical switchgear or protective equipment for voltages not greater than 1 kV; Electrical switchgear or protective equipment for voltage not greater than 1 kV; Other Electrical switchgear or protective equipment, not elsewhere classified; Electrical signaling devices, electrical equipment to provide traffic safety and control on railways, tramlines, motor roads, inland waterways, parking areas, in port facilities or at aerodromes; Refrigerators and freezers; washing machines; electrical blankets; fans; Parts of electrical appliances; Parts of lamps and lighting equipment; Parts of furnaces, stoves, plate heaters and similar nonelectrical appliances; Parts of electrical resistors, resistance units, and potentiometers; Parts of electrical capacitors; Parts of electrical capacitors, electrical resistors, resistance units and potentiometers; Sections of Electrical switchgear or regulating equipment; Parts of electrical motors, generators and transformers; Electrical motors with a capacity no greater than 37.5 W; other direct current motors; constant current generators; Universal AC and DC electrical motors with a capacity greater than 37.5 W; other AC electrical motors; AC generators (synchronous generators); Electrical motors, generators and transformers; Ballast elements for gas-discharge lamps or tubes; static electrical converters; other inductance coils; Magnetic, semiconductor logic elements; Primary elements and primary element batteries and their parts

Code TN VED (EAES)

2710 Petroleum and petroleum products obtained from bituminous rocks, except for raw products, not named or not included elsewhere, containing 70 % wt or more petroleum or petroleum products obtained from bituminous rocks, and these petroleum products are main product components; used petroleum products:; 8501 Electrical motors and generators (except for power generation units):; 8504 Electrical transformers, static electrical converters (for example, rectifiers), inductance coils and throttles:; 8504210000 - - of power not greater than 650

kVA; 850422 - - of power greater than 650 kV A, but not greater than 10 000 kVA:; 8504221000 - - - of power greater than 650 kVA, but not greater than 1 600 kVA; 8504229000 - - - of power greater than 1 600 kVA, but not greater than 10 000 kVA; 850423000 - - of power greater than 10 000 kVA:; 850431 - - of power not greater than 1 kVA:; 850431800 - - - others:; 850432000 -- of power greater than 1 kVA, but not greater than 16 kVA:; 8504320001 --- for civil aircrafts; 8504320002 - - - - Instrument transformers; 850433000 - - of power greater than 16 kVA, but not greater than 500 kVA:; 8504340000 - - of power greater than 500 kVA; 850450 - other inductance coils and throttles:; 850590 - others, including parts:; 8532 Fixed, variable or tuning electrical capacitors:; 8535 Electrical switchgear or protective equipment for connections to electrical circuits or in electrical circuits (for example, circuit-breakers, switches, interrupters, fuses, lightning rods, voltage suppressors, voltage jump dampers, pantographs, current collector and other connectors, connection boxes) for voltage greater than 1000 V:; 853530 disconnecting switches and interrupters:; 8535400000 - lightning rods, voltage suppressors and voltage jump dampers; 853590000 - others:; 8535900008 - - others; 8536 Electrical switchgear or protective equipment for connections to electrical circuits or in electrical circuits (for example, circuit-breakers, switches, interrupters, relay, fuses, voltage jump dampers, plugs and sockets, electrical lamp holders and other connectors, connection boxes) for voltage no greater than 1000 V; connectors for optical fibers, optical fiber bundles and cables:; 853610 - fuses:; 853620 automatic circuit-breakers:; 853630 - other electrical protective equipment:; 853650 - other switches:: 853670000 - connectors for optical fibers, optical fiber bundles and cables:: 853690 other devices:; 8537 Desk units, panels, consoles, tables, switchboard panels and other Electrical equipment bases, equipped by two or more devices of product item or 8536, for electrical current control or distribution, including instruments or devices of group 90 and digital control units, except for switchgears of commodity items 8517:; 853720 - for voltage greater than 1000 V:; 854442 - - fitted with connecting devices:; 854449 - - others:; 854460 - other electrical conductors for voltage greater than 1000 V; 8546 Electrical insulators made of any material:; 8546100000 - glass; 8546200000 - ceramic; 8546901000 - - plastic; 8547900000 - others Measurement type/ method

Measurement of physical factor parameters noise measurement; Other environmental investigation (testing) methods; Reliability, service-life tests other reliability, service-life investigation (testing) methods; Non-destructive testing visual method; Non-destructive testing visual inspection and measurements; Non-destructive testing non-destructive testing other non-destructive testing methods; Other investigation (testing) other investigation (testing) methods without specification; Thermotechnical tests temperature measurements; Physical and mechanical measurement of time and frequency; Physical and mechanical investigation (testing) methods to determine physical and mechanical parameters; Functional testing of structural systems and elements functional testing of structural systems and elements; Electrophysical investigation (testing) methods without specification

Calculated rates/ measured range

Resistance to condensation and water penetration/ environmental resistance measured range passed/failed; 50% discharge voltage in conditions of contamination measured range passed/failed; Absolute angular error measured range from -600 to +600 min; Adherence of protective coating measured range passed/failed; Interchangeability of identic replacement parts measured range passed/failed; Visible defects measured range availability/absence; Exterior measured range compliant/noncompliant; Internal insulation / Insulation strength / Electrical strength of internal transformer insulation measured range passed/failed; Water absorption capacity measured range passed/failed; Air clearances and leakage distances measured range from 0 to 8000 mm; Holding time measured range from 0 to 120 h; Holding time measured range from 0 to 23 h 59 min 59 s null; Time measured range from 0 to 23 h 59 min 59 s. null; Time measured range from 0 to 83699 s; Time measured range from 0 to 60 min; Arrangement of contact connections measured range confirmed/not confirmed; Extension force measured range from 0 to 500 N; Overall and

connecting dimensions measured range from 0 to 10000 mm; Overall and connecting dimensions measured range from 0 to 15000 mm; Overall dimensions measured range from 1 to 10000 mm; Harmonic composition of no-load current measured range from 0 to 100 %; Dimensions measured range passed/failed from 0 to 10000 mm; Dimensions measured range passed/failed from 0 to 15000 mm; Dimensions measured range from 0 to 15000 mm; Dimensions measured range from 0 to 50 m; Hermeticity measured range passed/failed; Annual gas leakage Calculated rate measured range passed/failed; Vector group calculated rate measured range from 0 to 11 null; Vector group measured range from 0 to 11 null; Vector group measured range confirmed Vector confirmed/not from 0 to 11 null; group measured range compliant/noncompliant; Pressure measured range from 0 to 0.9 MPa; Actuating pressure measured range from 0 to 0.9 MPa; Diameter measured range from 0 to 8000 mm; Length measured range from 0 to 8000 mm; Leakage path length measured range passed/failed from 0 to 10000 mm; Leakage path length measured range passed/failed from 0 to 100000 mm; Leakage path length measured range passed/failed from 0 to 15000 mm; Leakage path length measured range passed/failed from 0 to 8000 mm; Leakage path length measured range from 0 to 15000 mm; Test length measured range from 0 to 500 cm; Long-time alternating voltage with measurement of partial discharge intensity / DPN / Insulation strength in long-time alternating voltage test with measurement of partial discharge intensity measured range passed/failed; Exposure time measured range from 0 to 10 s; Exposure time measured range from 0 to 30 min; Transient period length measured range from 0 to 100 s; Capacity / Electrical capacity measured range from 20 to 106 pF; Capacity measured range from 0 to 1000 nF; Capacity measured range from 0 to 10⁶ pF; Capacity measured range from 20 to 1000000 pF; Capacity measured range from 20 to 10³ pF; Capacity measured range from 20 to 10⁶ pF; Winding capacity measured range from 20*10⁻¹² to 10⁻⁶ F; Corrosion protection measured range compliant/noncompliant; short-time induced alternating voltage measured range from 0 to 900 kV; Test lightning impulse voltage measured range from 0 to 2250 kV; Test switching impulse voltage measured range from 750 to 1600 kV; Test full lightning impulse voltage measured range from 0 to 2250 kV; Test chopped impulse voltage measured range from 0 to 2250 kV; Test voltage value measured range from 0 to 900 kV; Test power-frequency voltage measured range from 0 to 950 kV; Test power measured range from 0.1 to 10 kN; Short-time alternating voltage measured range from 0 to 900 kV; Applied short-time alternating voltage value measured range from 0 to 425 kV; Short-circuit impedance / total resistance/total ohmic losses measured range from 0 to 100000 Ohm; Zerosequence impedance/ total zero-sequence resistance measured range from 0.0000001 to 100000 Ohm; Pulse voltage measured range from 3 to 2250 kV; Impulse voltage measured range from 30 to 2250 kV; Impulse voltage measured range compliant/noncompliant from 0.33 to 20 kV; Inductive resistance Calculated rate measured range; Inductive resistance measured range from 0 to 30 kOhm; Induced short-time AC voltage / IKPN / Insulation strength measured range passed/failed; Induced voltage measured range from 0 to 900 kV; Proper mechanism operation measured range passed/failed; Proper mechanism operation measured range passed/failed; Proper operation measured range compliant/noncompliant; Indicator health measured range passed/failed; Test by continuous spark flow measured range passed/failed; Test by AC voltage measured range from 1 to 500 kV; Test power measured range from 0 to 5 kN; Test lightning impulse voltage measured range from 10 to 2250 kV; Test lightning impulse voltage measured range from 3 to 200 kV; Test voltage measured range from 0 to 10 kV; Test voltage measured range from 0 to 100 kV; Test voltage measured range from 0 to 150 kV; Test voltage measured range from 0 to 20 kV; Test voltage measured range from 0 to 300 kV; Test voltage measured range from 0 to 350 kV; Test voltage measured range from 0 to 500 V; Test voltage measured range from 0 to 500 kV; Test voltage measured range from 0 to 6 kV; Test voltage measured range from 0 to 900 kV; Test voltage measured range from 0 to 950 kV; Test voltage measured range from 1 to 350 kV; Test voltage measured range from 1 to 500 kV; Test voltage measured range from 10 to 80 kV; Test voltage measured range from 3 to 2250 kV; Test voltage measured range from 50 to 5000 V; Test switching surge voltage measured range from 750 to 1600 kV; Test voltage/ experiment voltage measured range from 0 to 100 kV; Test one-minute alternating voltage measured range from 0 to 300 kV; Test charging current of overhead and cable lines measured range from 0 to 5 A; Test direct current measured range from 0 to 100 A; Test current measured range from 0 to 100 A; test current measured range from 0 to 500 A; Test current measured range from 0 to 5000 A; Test current measured range from 0 to 5000 A; Test current

measured range from $0,1*10^{-3}$ to 100 A; Test current measured range from $0,1*10^{-3}$ to 100 A; Test current measured range from 100 to 5000 A; Test current measured range from 10⁻⁴ to 100 A; Test current measured range from 10⁻⁴ to 100 A; Test current measured range from 50 to 5000 A; Transformer no-load test current measured range from 0 to 5 A; Test current/ experiment current measured range from 0 to 6000 A; Test balancing current measured range from 0 to 1600 A; Corrosion-protective coating quality measured range passed/failed; Soldering quality measured range passed/failed; Surface condition measured range passed/failed; Protective coating surface condition measured range passed/failed; Surface condition of insulation parts measured range passed/failed; Quality of assembly and finishing measured range passed/failed; Water repellence class measured range from 1 to 7 class; Number of cycles measured range from 0 to 1000 cycles; Switching capacity measured range passed/failed; Switching / compensating current switching/ transformer no-load current switching / switching of charging current of overhead and cable lines measured range passed/failed; Switching current measured range from 0 to 80 A; Completeness measured range compliant/noncompliant; Structure measured range compliant/noncompliant; Contact pressure measured range from 0 to 5 kN; Check assembly PTS measured range passed/failed; Gas concentration measured range from 0 to 1000 mln⁻¹ (ppm); Corrected sound power level measured range from 30 to 137 dB; Absorption coefficient Calculated rate measured range; Attenuation factor measured range from 0 to -130 dB; Coupling coefficient Calculated rate measured range; Transformation ratio Calculated rate measured range; Transformation ratio measured range from 0.1 to 1000 null; Transformation ratio measured range from 0.8 to 9999 null; Short-time rated overcurrent measured range passed/failed from 0 to 5000 A; Pulse tilt measured range from 0 to 2000 kV/ µs; Pulse tilt measured range from 0 to 2500 kV/µs; Pulse tilt measured range from 500 to 2000 $kV/\mu s$; Pulse tilt measured range from 500 to 2500 kV/ μs ; Pulse tilt measured range from 500 to 3000 kV/ µs; Torque moment measured range from 0 to 100 N*m; Linear primary voltage / Linear secondary voltage/ Voltage between different clamps of different windings / Voltage measured range from 0.01 to 127 kV; Terminals marking measured range compliant/noncompliant; Marking measured range passed/failed; Marking and branding measured range confirmed/not confirmed; Marking and branding measured range compliant/noncompliant; Mass measured range passed/failed from 0,1 to 500 kg; Mass measured range passed/failed from 0,5 to 500 kg; Mass measured range passed/failed from 1 to 500 kg; Mass measured range from 0 to 2000 kg; Mass measured range from 0 to 500 kg; Mass measured range from 0 to 5000 kg; Mass measured range from 0.02 to 122 g; Mass measured range from 0.05 to 500 kg; Mass measured range from 4 to 500 kg; Intersection insulation measured range passed/failed; Turn-to-turn insulation measured range passed/failed; Interphase voltage/Voltage between phase terminal and neutral/test voltage measured range from 0 to 100 kV; Mechanical load measured range passed/failed from 0 to 10 kN; Mechanical load measured range from 0 to 10 kN; Mechanical load measured range from 0 to 50 kN; Mechanical strength measured range passed/failed; Mechanical bending strength in dry condition measured range passed/failed; Mechanical strength at wind load and horizontal tension of connecting leads passed/failed; Mechanical strength of switchgear structural elements in multiple operations measured range passed/failed from 0 to 10000 cycles from 0 to 1000 V; Mechanical strength of switchgear structural elements in multiple operations measured range passed/failed; Mechanical operability measured range passed/failed; Mechanical disruptive force measured range passed/failed; Mechanical force measured range from 0 to 1 kN; Power measured range from 0 to 10 kW; Load power measured range from 0 to 2000 V*A; Power/ no-load losses measured range from 0 to 40 kW; Heating measured range passed/failed; Continuous current-induced heating measured range passed/failed; Rated current-induced heating measured range passed/failed; heating of current-conducting circuit elements measured range passed/failed; Rated (admissible continuous) current-induced heating measured range passed/failed; Electromagnet winding heating measured range passed/failed; Load measured range from 0 to 1 kN; Load measured range from 0 to 10 kN; Load measured range from 0 to 2000 V*A; Load losses/ short-circuit losses measured range from 0 to 40 kW; Reliability of screws, currentconducting parts and connections measured range passed/failed; Reliability of fixtures measured range passed/failed; Reliability of threaded terminals for external copper conductors measured range passed/failed; Maximum force per hand measured range from 0 to 1 kN; Availability of indicators measured range availability/absence; Partial discharge inception and extinction

voltage measured range from 0 to 500 kV; Lightning impulse voltage measured range from 0 to 100 kV; Lightning impulse voltage measured range from 0 to 2250 kV; Lightning impulse voltage measured range from 3 to 2250 kV; Lightning impulse voltage measured range from 3 to 500 kV; Lightning impulse voltage measured range from 30 to 2250 kV; Voltage measured range from 0 to 100 kV; Voltage measured range from 0 to 1000 V; Voltage measured range from 0 to 35 kV; Voltage measured range from 0 to 500 V; Voltage measured range from 0 to 900 kV; Voltage measured range from 10 to 80 kV; Voltage measured range from 100 to 6000 V; Voltage measured range from 40 to 100 V; Voltage measured range from 50 to 5000 V; Indication voltage measured range from 0 to 100 kV; Switching surge voltage measured range from 30 to 1600 kV; Switching surge voltage measured range from 750 to 1600 kV; Switching surge voltage measured range from 750 to 2250 kV; Short-circuit voltage Calculated rate measured range; Short-circuit voltage measured range from 0 to 100 %; Voltage between terminals 1-2 measured range from 1 to 230 kV; Voltage between terminals 2-3 measured range from 1 to 230 kV; voltage across open triangle bushings measured range from 0 to 600 V; Experiment voltage measured range from 0 to 100 kV; Experiment voltage/applied voltage/Experiment voltage measured range from 0 to 100 kV; Primary voltage / Secondary voltage/Voltage measured range from 0,01 to 127 kV; Power voltage measured range from 0 to 1000 V; Power voltage measured range from 0 to 500 V; Partial discharge extinction voltage passed/failed; Direct current voltage measured range from 0 to 70 kV; Direct current voltage measured range from 2 to 70 kV; Power-frequency voltage measured range from 0 to 150 kV; Power-frequency voltage measured range from 0 to 200 kV; Power-frequency voltage measured range from 0 to 350 kV; Power-frequency voltage measured range from 0 to 5 kV; Powerfrequency voltage measured range from 0 to 500 kV; Power-frequency voltage measured range from 0 to 950 null; Power-frequency voltage measured range from 0 to 950 kV; Powerfrequency voltage measured range from 1 to 950 kV; Power-frequency voltage measured range from 100 to 6000 V; Actuation voltage measured range from 0 to 1000 V; Voltage measured range from 0 to 900 kV; Continuity measured range passed/failed; Continuity of earthed metal parts measured range passed/failed; Pressure continuity of sliding earthing contacts measured range passed/failed; Pressure continuity of sliding earthing contacts measured range passed/failed from 0.02 to 0.5 mm; Protective circuit continuity measured range passed/failed; Protected against steep impulse voltage breakdown measured range passed/failed; Total current of three phase windings measured range from 0 to 6000 A; Post-switching-off measurement of average winding temperature measured range; Switchgear and main circuit drivers on-off test Switchgear and main circuit drivers on-off test measured range passed/failed; Axial displacement measured range from 0.01 to 10 mm; Deviation from nominal dimensions measured range passed/failed; Out-of-straightness measured range from 0 to 50 mm; Braking capacity measured range passed/failed; Relative air humidity measured range from 10 to 98 %; Relative current error measured range from 0.01 to 100 %; Relative electrical contact resistance calculated rate measured range; Absence of visible corona measured range passed/failed; Voltage drop measured range from 0 to 100 V; Flange face surfaces parallelism measured range passed/failed from 0 to 10 mm; AC voltage measured range from 0 to 100 kV; AC voltage measured range from 0 to 200 kV; AC voltage measured range from 0 to 250 kV; AC voltage measured range from 0 to 35 kV; AC voltage measured range from 0 to 350 kV; AC voltage measured range from 0 to 425 kV; AC voltage measured range from 0 to 5 kV; AC voltage measured range from 0 to 50 kV; AC voltage measured range from 0 to 500 kV; AC voltage measured range from 0 to 600 kV; AC voltage measured range from 0 to 80 kV; AC voltage measured range from 0 to 900 kV; AC voltage measured range from 0 to 950 kV; AC voltage measured range from 1 to 100 kV; AC voltage measured range from 1 to 350 kV; AC voltage measured range from 1 to 425 kV; AC voltage measured range from 1 to 500 kV; AC voltage measured range from 1 to 900 kV; AC voltage measured range from 1 to 950 kV; AC voltage measured range from 10 to 500 kV; AC voltage measured range from 10 to 80 kV; AC voltage measured range from 100 to 6000 V; AC voltage measured range from 11 to 950 kV; AC voltage measured range from 20 to 400 kV; AC Power-frequency voltage measured range from 0 to 500 kV; Alternating Powerfrequency voltage measured range from 0 to 80 kV; Alternating current measured range from 0 to 6000 A; Displacement measured range from 1 to 900 mm; TN scaling voltage conversion factor error (voltage error TN) measured range from 0,01 to 100 %; Applied experiment voltage measured range from 0 to 127 kV; Winding polarity/ correctness of contact clamps and terminals

marking measured range compliant/noncompliant; Electrical insulation resistance constant measured range; DC voltage measured range from 0 to 100 V; Direct current measured range from 0.0001 to 100 A; Direct current measured range from 0.0001 to 10 A; Direct current measured range from 0.0001 to 100 A; Direct current measured range from 0.1*10⁻³ to 100 A; Transformer losses measured range from 0 to 40 kW; Short-circuit losses measured range; Shortcircuit losses measured range from 0 to 40 kW; Reversal magnetization losses measured range passed/failed; No-load losses measured range from 0 to 40 kW; Consumed power Calculated rate measured range; Consumed power measured range from 0 to 100 kW; Proper arrangement of operative control, protection, automatic and alarm circuits measured range passed/failed; Correctness of nameplates measured range compliant/noncompliant; Correctness of nameplates measured range compliant/noncompliant; Correctness of marking measured range confirmed/not confirmed; Correctness of marking measured range compliant/noncompliant; Temperature rise Calculated rate measured range; Temperature rise Calculated rate measured range passed/failed; Temperature rise measured range; Temperature rise of individual transformer elements over coolant temperature / Temperature rise of individual transformer elements / Transformer heating / Temperature-rise tests Temperature-rise tests measured range; Applied voltage measured range from 0 to 425 kV; Breakdown voltage measured range from 0 to 500 kV; Breakdown voltage at 50 Hz frequency measured range passed/failed; Breakdown voltage at 50 Hz frequency measured range from 0 to 100 kV; Breakdown voltage at 50 Hz frequency measured range from 0 to 350 kV; Breakdown voltage at 50 Hz frequency measured range from 0 to 400 kV; Verification of nameplate data compliance to the specified requirements measured range confirmed/not confirmed; Switchgear functional check measured range passed/failed; bending deflection measured range from 0 to 100 cm; Bending strength measured range passed/failed; Tensile strength measured range passed/failed; Operation of locking devices measured range passed/failed; Operability of locking devices measured range passed/failed; Operability of capacitor transformers in transient modes measured range passed/failed; Operability at combined effects of leads tension and wind load measured range passed/failed; Radial displacement measured range from 0.01 to 10 mm; Dimensions measured range from 0 to 10000 mm; Dimensions measured range from 0 to 15000 mm; Dimensions measured range from 0 to 50000 mm; Dimensions measured range from 0 to 8000 mm; Current division in parallel winding wires measured range from 0 to 630 A; Resonance frequency measured range compliant/noncompliant; mechanical durability measured range passed/failed; Force measured range from 0 to 1 kN; Force measured range from 0 to 2 kN; Force measured range from 0 to 50 kN; Speed / Closing speed / Opening speed measured range; Switchgear contact speed in closing and opening operations measured range passed/failed; Gas leakage rate calculated rate measured range; Corrected no-load losses measured range from 0 to 150 kW; Proper time / Closing time / Opening time measured range from 10^{-4} to 10 s; Closing time measured range passed/failed from 10⁻⁴ to 10 s; Opening time measured range passed/failed from 10⁻⁴ to 10 s; Proper time/ Closing time / Opening time measured range from $0.2*10^{-3}$ to 6.5 s; Alignment of main and auxiliary circuits detachable contacts measured range from 0.1 to 1000 mm; Insulation compliance with rated test voltage / Insulation strength measured range passed/failed; Compliance with design drawings measured range compliant/noncompliant; Compliance with assembly drawing measured range compliant/noncompliant; Compliance with assembly drawing dimensions measured range compliant/noncompliant; Accompanying documents measured range compliant/noncompliant; Resistance / Electrical resistance measured range from 1 to 1000 µOhm; Resistance of auxiliary contacts of class 3 measured range from 10⁻⁶ to 1999.9 Ohm; Resistance of auxiliary contacts of classes 1 and 2 measured range from 10⁻⁶ to 1999.9 Ohm; Resistance of gear main circuit measured range from 1*10⁻⁶ to 1999.9 Ohm; Resistance measured range from 0 to 1 kOhm; Resistance measured range from 0.000001 to 199.9 Ohm; Resistance measured range from 0.000001 to 200 000 Ohm; Resistance measured range from 10⁻⁶ to 2*10⁵ Ohm; Main circuit insulation resistance measured range compliant/noncompliant from 0.1 to 300*10° Ohm; Insulation resistance measured range from 0 to 1000 GOhm; Insulation resistance measured range from 0.000003 to 1000 GOhm; Insulation resistance measured range from 0.003 to 1000 GOhm; Insulation resistance measured range from 3*10³ to 1000*10° Ohm; Insulation resistance measured range from 3*10³ to 10¹² Ohm; Insulation resistance measured range from $3 \cdot 10^3$ to 10^{12} Ohm; Insulation resistance measured range compliant/noncompliant from 0.1 to 300*109 Ohm; Winding insulation resistance measured range from 0 to 1000 GOhm; Winding insulation resistance measured range from 3*10³ to 10¹² Ohm; Core resistance (winding) measured range from 0.000001 to 199.9 Ohm; Resistance between clamp PE and different protective circuit points measured range passed/failed; Zerosequence resistance measured range from 0.0000001 to 100000 Ohm; Winding resistance measured range from 0.000001 to 20000 Ohm; Winding DC resistance measured range from 0.0001 to 100000 Ohm; Winding DC resistance measured range from 2*10⁻⁴ to 2*10⁵ Ohm; DC resistance measured range passed/failed from 10⁻⁶ to 1999.9 Ohm; DC resistance measured range from 0.000001 to 199.9 Ohm; Resistance of current-conducting circuit measured range from *10⁻⁶ to 199.9 Ohm; Resistance of current-conducting circuit elements measured range from 10⁻⁶ to 199.9 Ohm; Resistance/ "Cold" winding resistance/ Resistance under load losses/ DC winding resistance measured range from 0.0002 to 200000 Ohm; Protective coating condition measured range passed/failed; Protective coating condition measured range detected/not detected; Protective coating condition measured range compliant/noncompliant; Protective coating condition of external parts measured range compliant/noncompliant; Earthing clamp pad condition measured range compliant/noncompliant; Surface condition measured range passed/failed; Surface condition measured range detected/not detected; Surface condition measured range compliant/noncompliant; Surface condition of external insulation parts measured range compliant/noncompliant; Auxiliary transformer no-load current breaking capacity measured range passed/failed; Static load measured range from 0 to 10 kN; Degree of protection from external solid objects measured range passed/failed from 1 to 4 null; Degree of water protection designated by the second characteristic digit measured range from 3 to 5 null; Degree of protection against access to hazardous parts measured range passed/failed; Degree of protection against access to hazardous parts measured range passed/failed from A to D null; Degree of protection against access to hazardous parts from 1 to 4 null; Degree of protection from foreign solid body penetration measured range from 1 to 4 null; Thermal break-down resistance of insulation measured range passed/failed; Resistance to condensation and water penetration measured range passed/failed; Resistance to steep voltage impulses measured range passed/failed; Resistance to wind, glaze-ice loads, and lead tension measured range passed/failed; Static load resistance measured range passed/failed; Resistance to cycles under load and in release condition measured range passed/failed; Resistance to locking device removal measured range passed/failed; Resistance to heating measured range passed/failed; Resistance to continuous spark flow measured range passed/failed; Resistance to water penetration measured range passed/failed; Coloring liquid penetration resistance measured range passed/failed; Resistance to short-circuit discharges measured range passed/failed; Resistance to thermal shock load measured range passed/failed; Thermal-shock resistance / to thermal shock load measured range passed/failed; Mark permanency measured range passed/failed; Actuator resistance to current-induced heating measured range passed/failed; Dielectrical loss-angle tangent measured range from 0.01 to 100 %; Loss-angle tangent / Dielectrical loss-angle tangent measured range from 0.01 to 100 %; Water temperature measured range from 0 to 100 °C; Temperature measured range passed/failed from 0 to 300 °C; Temperature measured range from -40 to 300 °C; Temperature measured range from -60 to +75 °C; Temperature measured range from -60 to +85 °C; Temperature measured range from -60 to 70 °C; Temperature measured range from 0 to +300 °C; Temperature measured range from 0 to 300 °C; Oil temperature measured range from 0 to 100 °C; Ambient temperature measured range from -40 to 85 °C; Ambient temperature measured range from 0 to +300 °C; Ambient temperature measured range from 0 to 300 °C; Ambient temperature from 0 to 60 °C; Cooling medium temperature measured range from 0 to 300 °C; Surface temperature measured range from 0 to +300 °C; Temperature measured by resistance test method /Coil (winding) temperature measured range; Temperature, measured by thermometer method measured range from -40 to 100 °C; Temperature measured by thermocouple method measured range from -40 to 300 °C; Temperature/ Coolant temperature/ Transformer elements temperature measured range from 0 to +300 °C; Heat resistance measured range passed/failed; Technical documentation measured range compliant/noncompliant; Circuital current measured range from 0.001 to 100 A; Current measured range from 0 to 50 A; Current measured range from 0 to 6000 A; Current measured range from 0.0001 to 100 A; Current measured range from 10⁻⁴ to 100 A; Magnetizing current measured range from 0 to 100 A; Magnetizing current measured range compliant/noncompliant from 0 to 100 A; Experiment current measured range from 0 to 6000 A; Experiment current/ no-

load current measured range; Experiment current/ no-load current/ mean-square value of no-load current measured range from 0 to 400 A; Useful current measured range from 0 to 100 A; Leakage current across open contacts compliant/noncompliant from 0 to 20 mA; No-load current measured range from 0 to 3 A; No-load current measured range from 10⁻³ to 100 A; Protecting coating thickness measured range from 0 to 5000 µm; Zinc coating thickness measured range passed/failed from 0 to 5000 µm; Tracking-erosion resistance measured range passed/failed; Tracking-erosion resistance measured range passed/failed from 10 to 80 kV; Tracking resistance measured range passed/failed; Angular error (phase voltage shift angle error) measured range from -600 to +600 min; Water conductivity measured range from 0.1 to 1.5 Sm/m; Electrical conductivity measured range from 0 to 2000 µS /cm; Specific volume Electrical resistance measured range; Packing and marking measured range compliant/noncompliant; Level ChR/Partial discharge factor measured range from 1 to 10000 pC; Radio interference level measured range passed/failed; Radio interference level measured range passed/failed from 01 to 100 dB; Radio interference level measured range passed/failed from 10 to 100 dB; Radio interference level measured range from 1 to 100 dB from 1 to 500 kV; Radio interference level measured range from 10 to 100 dB; Partial discharge factor / Partial discharge characteristics measured range from 10 to 10000 pC; Partial discharge factor / partial discharge apparent charge measured range from 1 to 10⁴ pC; Partial discharge factor measured range passed/failed from 0 to 10⁴ pC; Partial discharge factor measured range passed/failed from 1 to 10000 pC; Partial discharge factor measured range passed/failed from 1 to 10000 pC; Partial discharge factor measured range from 1 to 10000 pC; Partial discharge factor measured range from 1 to 10000 pC; Partial discharge factor measured range from 1 to 10000 pC from 1 to 350 kV; Partial discharge factor measured range from 1 to 100000 pC; Partial discharge factor at specified test voltage measured range from 1 to 10000 pC; Force measured range from 0 to 1 kN; Force measured range from 0 to 10 kN; Force measured range from 0 to 100 N; Pressure force measured range from 50 to 500 N; Setting dimensions measured range from 1 to 10000 mm; Resistance to long-term single-phase earthed short-circuit of the power line measured range passed/failed; Resistance to climatic effects measured range passed/failed; High-temperature resistance measured range passed/failed; Resistance to short-circuit current measured range passed/failed; Phase angle measured range from 0 to 360...°; Fixing measured range passed/failed; Operation measured range passed/failed; operation of cabinet and withdrawable parts mechanisms measured range passed/failed; Travel of auxiliary-circuit detachable contacts Travel of main and auxiliary circuits detachable contacts measured range from 0.1 to 1000 mm; Cycles measured range from 0 to 30 cycles; Rotation frequency measured range passed/failed from 100 to 30000 rpm; Rotation frequency measured range from 100 to 30000 rpm; Frequency measured range from 20 to 200000 Hz; Frequency measured range from 3 to 400 Hz; Frequency measured range from 45 to 200 Hz; Frequency measured range from 5 to 100 Hz; Test voltage frequency measured range from 0 to 200 Hz; Test voltage frequency measured range from 45 to 200 Hz; Flange face surfaces eccentricity measured range passed/failed from 0 to 10 mm; Electrical capacity measured range from 20 to 10⁶ pF; Electrical strength of external contaminated insulation measured range passed/failed; Electrical strength of auxiliary circuits measured range passed/failed; Electrical strength measured range passed/failed; Electrical strength of insulating part measured range passed/failed from 0 to 230 kV; Insulation strength / Ground insulation of transformer winding linear terminals with incomplete neutral insulation / Electrical liner terminal strength under short-time alternating voltage / LKPN measured range passed/failed; Insulation strength / Lightning impulse voltage / PGI / SGI / GIVN / GIMV/ insulation strength at lightning impulse voltage measured range passed/failed; Insulation strength / Short-time applied AC voltage / PKPN measured range passed/failed; Insulation strength / Electrical internal insulation strength / Electrical strength of internal transformer insulation measured range passed/failed; Auxiliary circuit insulation strength measured range passed/failed; Main circuit insulation strength measured range passed/failed; Double-pole indicator insulation strength measured range passed/failed; Insulation strength measured range passed/failed; Insulation strength of measuring terminal measured range passed/failed; Insulation strength in long-time induced AC voltage test with measurement of partial discharge intensity measured range passed/failed; Insulation strength in short-time induced AC voltage test measured range passed/failed; Insulation strength in induced voltage test passed/failed; Insulation strength in induced voltage test commercial-frequency AC voltage measured range passed/failed; Insulation

strength in short-time AC voltage test measured range passed/failed; Insulation strength in full lightning impulse test measured range passed/failed; Insulation strength at switching impulse voltage / Switching impulse voltage / SI measured range passed/failed; Electrical strength under long-tine Power-frequency voltage measured range passed/failed; Electrical strength in full lightning impulse test measured range passed/failed from 0 to 2250 kV; Electrical strength in chopped lightning impulse test measured range passed/failed from 0 to 2250 kV; Electrical strength of operating unit measured range passed/failed from 0 to 230 kV; Electrical current measured range from 0 to 100 A; Electrical current measured range from 0.0001 to 100 A; Electrical resistance / Electrical resistance of current conducting cores and conductors from 10⁻⁶ to 199.9 Ohm; Electrical resistance measured range from 0.000001 to 199.9 Ohm; Electrical resistance measured range from 0.000001 to 1999.9 Ohm; Electrical resistance measured range from 1 to 1000 Ohm; Electrical resistance measured range from 1*10⁻⁶ to 1999.9 Ohm; Electrical resistance measured range from 10⁻⁶ to 199.9 Ohm; Electrical protective earthing resistance. Electrical earthing resistance of touchable metallic parts measured range from 10⁻⁶ to 199.9 Ohm; Electrical insulation resistance measured range from 0 to 1000 GOhm; Electrical insulation resistance measured range from 0 to 10¹² Ohm; Electrical insulation resistance measured range from 0.003 to 1000 GOhm; Electrical insulation resistance measured range from 3*10³ to 10¹² Ohm; Electrical resistance of charging device insulation measured range from 3*10³ to 10¹² Ohm; Electrical DC resistance measured range from 0.000001 to 10000 Ohm; Electrical DC resistance measured range from 0.000001 to 1999.9 Ohm; Electrical DC resistance measured range from 0.000001 to 9990 Ohm; terminal marking measured range passed/failed; correctness of nameplates measured range passed/failed; protective coating condition of outside parts measured range passed/failed; condition of earthing clamp pads measured range passed/failed; Surface condition of outside insulation parts measured range passed/failed; Temperature measured range from 0 to 300 °C

Procedure

Dry-type transformers. General specifications GOST R 54827 26.3; Dry-type transformers. General specifications GOST R 54827 27.3, 27.4; Dry-type transformers. General specifications GOST R 54827 Clause 20; Dry-type transformers. General specifications GOST R 54827 Clause 21 (Full lightning impulse); Dry-type transformers. General specifications GOST R 54827 Clause 21 (Chopped lightning impulse); Dry-type transformers. General specifications GOST R 54827 Clause 22; Metal-enclosed switchgear for voltage up to 10 kV. Test methods GOST 14694 Subclause 4.6; Small-size Electrical equipment. Overcurrent protection circuit-breakers for household and analogous use. Part 1. AC circuit-breakers GOST IEC 60898-1-2020 Subclause 9.5; Small-size Electrical equipment. Overcurrent protection circuit-breakers for household and analogous use. Part 1. AC circuit-breakers GOST IEC 60898-1-2020 Subclause 9.7.4 (insulation resistance); Small-size Electrical equipment. Overcurrent protection circuitbreakers for household and analogous use. Part 1. AC circuit-breakers GOST IEC 60898-1-2020 Subclause 9.7.4 (electrical strength); Small-size Electrical equipment. Overcurrent protection circuit-breakers for household and analogous use. Part 1. AC circuit-breakers GOST IEC 60898-1-2020 Subclause 9.7.5; Small-size Electrical equipment. Overcurrent protection circuit-breakers for household and analogous use. Part 1. AC circuit-breakers GOST IEC 60898-1-2020 Subclause 9.9; AC equipment and Electrical devices for voltage greater than 1000 V. Heating rates in continuous operating regimes and test methods GOST 8024 Subclause 2.3; AC equipment and Electrical devices for voltage greater than 1000 V. Heating rates in continuous operating regimes and test methods GOST 8024 Subclause 2.4; AC equipment and Electrical devices for voltage greater than 1000 V. Heating rates in continuous operating regimes and test methods GOST 8024 Subclause 2.5; Insulated bushings for voltages greater than 1000 VAC IEC 60137(2017) 8.6; Insulated bushings for voltages greater than 1000 VAC IEC 60137(2017) 9.6; Insulated bushings for voltages greater than 1000 VAC IEC 60137(2017) Subclause 8.3; Insulated bushings for voltage greater than 1000 VAC IEC 60137(2017) Subclause 8.8; Electrical bushings in nuclear power plant enclosure structure GOST R 52287-2004 (IEC-60772-1983) Subclause 6.4.9; AC circuit-breakers for voltages from 3 to 750 kV. General specifications GOST R 52565 Subclause 9.1 (by visual inspection); AC circuit-breakers for voltages from 3 to 750 kV. General specifications GOST R 52565 Subclause 9.1 (by general-purpose balance); AC circuit-breakers for voltages from 3 to 750 kV. General specifications GOST R 52565 Subclause

9.1 (by universal measuring tools); AC circuit-breakers for voltages from 3 to 750 kV. General specifications GOST R 52565 Subclauses 9.2.1.2, 9.2.2.2; AC circuit-breakers for voltages from 3 to 750 kV. General specifications GOST R 52565 Subclauses 9.2.1.2, 9.2.2.3; AC circuitbreakers for voltages from 3 to 750 kV. General specifications GOST R 52565 Subclauses 9.2.1.2, 9.2.2.4; AC circuit-breakers for voltages from 3 to 750 kV. General specifications GOST R 52565 Subclauses 9.2.1.2, 9.2.2.5; AC circuit-breakers for voltages from 3 to 750 kV. General specifications GOST R 52565 Subclauses 9.2.1.2, 9.2.2.6; AC circuit-breakers for voltages from 3 to 750 kV. General specifications GOST R 52565 Subclauses 9.2.1.2, 9.2.2.8; AC circuitbreakers or voltages from 3 to 750 kV. General specifications GOST R 52565 Subclauses 9.2.1.2, 9.2.3; AC circuit-breakers for voltages from 3 to 750 kV. General specifications GOST R 52565 Subclauses 9.2.1.2, 9.2.4; AC circuit-breakers for voltages from 3 to 750 kV. General specifications GOST R 52565 Subclauses 9.2.1.2, 9.2.6; State System for Ensuring Uniform Measurement. Current transformers. Check-out procedure GOST 8.217 Subclause 9.4; Linear cap-and-pin suspension insulator. General specifications GOST 6490 Subclause 7.4.1; Porcelain and glass linear pin insulators for voltage from 1 to 35 kV. General specifications GOST 1232 Subclause 8.12.1; Porcelain and glass linear pin insulators for voltage from 1 to 35 kV. 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General specifications GOST R 52726 Subclause 8.8.2; Operation manual VR41.00.000RE Subclause 2.4.1; IEC standards High-voltage switchgear and controlgear - Part 1: Common specifications for AC switchgear and controlgear IEC 62271-1 ed. 2.1 Subclause 7.10.5; IEC standards High-voltage switchgear and controlgear - Part 1: Common specifications for AC switchgear and controlgear IEC 62271-1 ed. 2.1 Subclause 7.4.3; IEC standards High-voltage switchgear and controlgear - Part 1: Common specifications for AC switchgear and controlgear IEC 62271-1 ed. 2.1 Subclause 7.4.4; IEC standards High-voltage switchgear and controlgear - Part 1: Common specifications for AC switchgear and controlgear IEC 62271-1 ed. 2.1 Subclause 7.5; IEC standards High-voltage switchgear and controlgear -Part 1: Common specifications for AC switchgear and controlgear IEC 62271-1 ed. 2.1 Subclause 7.9.1.1; IEC standards High-voltage switchgear and controlgear - Part 1: Common specifications for AC switchgear and controlgear IEC 62271-1 ed. 2.1 Subclauses 7.2.1 - 7.2.9, 7.2.12; IEC standards IEC 60060-1(2010) ed. 3.0 Clauses 4, 6; IEC standards IEC 60060-1(2010) ed. 3.0 Clauses 4, 7; IEC standards IEC 60060-1(2010) ed. 3.0 Clauses 4, 8; IEC standards IEC 60076-1(2011) Subclause 11.2; IEC standards IEC 60076-1(2011) Subclause

11.3; IEC standards IEC 60076-18(2012) Clause 4; IEC standards IEC 60076-3(2013) Clause 11; IEC standards IEC 60076-3(2013) Clauses 10, 12, 13, 14; IEC standards IEC 60137(2017) Subclause 8.10; IEC standards IEC 60137(2017) Subclause 8.14; IEC standards IEC 60137(2017) Subclause 8.2; IEC standards IEC 60137(2017) Subclause 8.4; IEC standards IEC 60137(2017) Subclause 8.5; IEC standards IEC 60137(2017) Subclause 8.7; IEC standards IEC 60137(2017) Subclause 9.2; IEC standards IEC 60137(2017) Subclause 9.5; IEC standards IEC 61869-1(2007) Subclause 7.2.7.1; IEC standards IEC 61869-1(2007) Subclause 7.3.2; IEC standards IEC 61869-1(2007) Subclause 7.4.3; IEC standards IEC 61869-1(2007) Subclause 7.4.5; IEC standards IEC 61869-1(2007) Subclauses 7.2.3.1 - 7.2.3.3, 7.2.4, 7.3.1, 7.3.3, 7.3.4, 7.4.1, 7.4.2; IEC standards IEC 61869-2(2012) Subclause 7.3.203; IEC standards IEC 61869-2(2012) Subclause 7.4.3; IEC standards IEC 61869-2(2012) Subclauses 7.2.3, 7.3.1; IEC standards IEC 61869-2(2012) Subclauses 7.2.6, 7.3.5; IEC standards IEC 61869-3(2011) ed.1 Subclause 7.2.301; IEC standards IEC 61869-3(2011) ed.1 Subclause 7.4.3; IEC standards IEC 61869-3(2011) ed.1 Subclauses 7.2.3.1-7.2.3.3, 7.3.1, 7.3.2; IEC standards IEC 61869-3(2011) ed.1 Subclauses 7.2.6, 7.3.5; IEC standards Power transformers - Part 11: Dry-type transformers IEC 60076-11 ed. 2.0 Subclause 14.4.4; IEC standards Power transformers - Part 11: Dry-type transformers IEC 60076-11 ed. 2.0 Subclause 14.4.5; Instrument transformers. Part 1. General requirements IEC 61869-1(2007) Subclause 7.2.2; Instrument transformers. Part 1. Current transformers GOST IEC 60044-1-2013 Subclause 7.2; Instrument transformers. Part 3. Specific requirements for inductive voltage converter IEC 61869-3(2011) ed.1 Subclause 7.2.2; Voltage transformers. General specifications GOST 1983 Subclause 9.1 (by visual inspection); Voltage transformers. General specifications GOST 1983 Subclause 9.12; Voltage transformers. General specifications GOST 1983 Subclause 9.13; Voltage transformers. General specifications GOST 1983 Subclause 9.9; Voltage transformers. General specifications GOST 1983 Subclauses 9.7, 9.8; Power transformers and reactors. Insulation strength test methods and requirements. GOST R 56738-2015 Clause 10; Power transformers. Temperature-rise tests GOST 3484.2-88 Appendix 3, Clause 2 (calculation); Power transformers. Temperature-rise tests GOST 3484.2-88 Clause 5 (calculation); Power transformers. Temperature-rise tests GOST 3484.2-88 Clauses 1 -4, 6; Power transformers. Winding tap-changer test methods GOST 8008 Subclause 7; Power transformers. Electromagnetic test methods GOST 3484.1-88 3.1.4; Power transformers. Electromagnetic test methods GOST 3484.1-88 Clause 5; Power transformers. Electromagnetic test methods GOST 3484.1-88 Clause 6; Power transformers. Electromagnetic test methods GOST 3484.1-88 Clause 7; Power transformers. Electromagnetic test methods GOST 3484.1-88 Clause 8; Power transformers. Electromagnetic test methods GOST 3484.1-88 Subclause 2.2.3; Power transformers. General specifications GOST R 52719 Subclause 10.1 (visually); Power transformers. Part 1. General provisions IEC 60076-1 Appendix E; Power transformers. Part 1. General provisions IEC 60076-1 Subclause 11.4; Power transformers. Part 1. General provisions IEC 60076-1 Subclause 11.5; Power transformers. Part 1. General provisions IEC 60076-1 Subclause 11.6; Power transformers. Part 2. Liquid-filled transformer temperature increase IEC 60076-2(2011) Clause 7; Current transformers. General specifications GOST 7746 Subclause 9.1 (visual inspection); Current transformers. General specifications GOST 7746 Subclause 9.1 (by general-purpose balance); Current transformers. General specifications GOST 7746 Subclause 9.1 (by universal measuring tool); Current transformers. General specifications GOST 7746 Subclause 9.5.1.1; Current transformers. General specifications GOST 7746 Subclause 9.9; Voltage indicating devices. General specifications GOST 20493-2001 Subclauses 8.10.8, 8.10.9; Voltage indicating devices. General specifications GOST 20493-2001 Subclauses 8.4, 8.5, 8.10.5; Voltage indicating devices. General specifications GOST 20493-2001 Subclauses 8.4, 8.5, 8.10.6; Voltage indicating devices. General specifications GOST 20493-2001 Subclauses 8.4, 8.5, 8.9.5; Voltage indicating devices. General specifications GOST 20493-2001 Subclauses 8.9.2, 8.10.3; Voltage indicating devices. General specifications GOST 20493-2001 Subclauses 8.9.2, 8.8; Metal-enclosed switchgear for rated voltage up to 35 kV. General specifications GOST R 55190 Subclause 8.3.2.1; Metal-enclosed switchgear for rated voltage up to 35 kV. General specifications GOST R 55190 Subclause 8.3.2.2; Metal-enclosed switchgear for rated voltage up to 35 kV. General specifications GOST R 55190 Subclause 8.4.5.1; Metal-enclosed switchgear for rated voltage up to 35 kV. General specifications GOST R 55190 Subclause 8.9.2; Sulphur hexafluoride-insulated metal-enclosed switchgear for rated voltages from 110 kV and above. General specifications GOST R 54828-2022 Subclause 8.10.3; Control electromagnets.

General specifications GOST 19264-82 Subclause 7.8; AC Electrical equipment and installations for voltage from 3 kV and above. General insulation strength methods GOST 1516.2 Clauses 1 -4, Subclauses 7.1 - 7.3, 7.7; AC Electrical equipment and installations for voltage from 3 kV and above. General insulation strength methods GOST 1516.2 Clauses 1 - 6, Subclauses 7.1 - 7.4, Clause 8; AC Electrical equipment and installations for voltage from 3 kV and above. General insulation strength methods GOST 1516.2 Subclauses 4.1 – 4.5, 7.1 – 7.3, 7.5; AC Electrical equipment and installations for voltage from 3 kV and above. General insulation strength methods GOST 1516.2 Subclauses 4.1 – 4.5, 7.1 – 7.3, 7.7; AC Electrical equipment and installations for voltage from 3 kV and above. General insulation strength methods GOST 1516.2 Subclauses 4.1-4.5, Clauses 5, 6, sub Subclause7.1-7.5, 7.7, Clause 8; AC Electrical equipment and installations for voltages from 1 to 750 kV. General insulation strength methods GOST R 55194 Subclauses 4.1 - 4.4, 7.1 - 7.4, 7.8; AC Electrical equipment and installations for voltages from 1 to 750 kV. General insulation strength methods GOST R 55194 Subclauses 4.1, 4.4, 4.5, Clauses 5, 6, Subclauses 7.1 – 7.5, Clause 8; Electrical equipment and installations. Measurement method of partial discharge characteristics GOST 20074 Clauses 1 - 5; Electrical equipment for voltage greater than 3 kV. Contaminated external insulation methods GOST 10390 Subclauses 4.2, 4.5 - 4.11, Clause 5; Subclauses 6.1 - 6.10, 6.12.1, 6.17; Electrical equipment for voltage greater than 3 kV. Contaminated external insulation methods GOST 10390 Subclauses 4.2, 4.5 – 4.11, Clause 5; Subclauses 6.1 – 6.16, 6.19, 6.20; tests GOST R 56738-2015 Subclauses 11.1, 11.2; Subclause 2.5, 2.8 GOST 22756 Subclauses 2.5, 2.8; Subclauses 1.5.3, 1.5.4, 2.7.2, 2.7.3, 2.7.7 GOST 22756 Subclauses 1.5.3, 1.5.4, 2.7.2, 2.7.3, 2.7.7; Subclauses 2.6, 2.9, 3.2 GOST 22756 Subclauses 2.6, 2.9, 3.2; Subclauses 2.7, 2.10, 3.3 GOST 22756 Subclauses 2.7, 2.10, 3.3; Clause 14 GOST R 56738-2015 Clause 14; tr GOST R 56738-2015 Clause 12; trances GOST R 56738-2015 Subclause 11.3; trr GOST R 56738-2015 Clause 13

Name of test object

001 Railway rolling stock and its components; 002 High-speed railway transport and high-speed railway transport infrastructure; 002.001.11 Insulators for electrified railway overhead; 003 Railway transport infrastructure; 003.001.11 Insulators for electrified railway overhead; 003.009 Insulators for electrified railway overhead; 3185.1 Insulators for electrified railway overhead; 3185.29 Reactors for electrified railroad substations; 3411.1 Reactors, including concrete current-limiting reactors; 3414.14 Capacitors and capacitor units; 710 Decision of Customs Union Commission of July 15, 2011 No 710 (TR TS 001/2011, TR TS 002/2011, TR TS 003/2011) (Revision of October 30, 2018); null Power circuit-breakers; null Plastic and paper-insulated power cables for stationary cable laying for voltage greater than 1 kV (through to 35 kV); null Single-end service assembled chamber; null Switchgears; null Sulfur hexafluoride insulated switchgears; null Packaged transformer substations; null Capacitors and capacitor units; null Discharge switches, isolating switches and short-circuiting switches; null Power transformers; null Current transformers

Status Active RA.RU.21HH33 Date of making an entry November 15, 2018 Type Testing laboratory Inclusion in the national part of the Unified Register No

- ACCREDITED PARTY
- ACCREDITATION SCOPE
- ACCREDITATION
- STATE SERVICES
- APPLICANT

• ACCREDITED CONFORMITY ASSESSMENT BODY

No. of decision on accreditation Aa-727 Date of decision on accreditation November 15, 2018 Full name of accreditation expert Panchenko Viktor Aleksandrovich Accreditation expert registration entry number 00886 Expert organization Federal Autonomous Institution "National Institute of Accreditation" Technical expert Makurin Denis Alekseevich

- w/o configurator
- w/configurator

Status Active Unique accreditation record number in the Register of Accredited Conformity Assessment Bodies RA.RU.21HH33 Date of making an entry November 15, 2018 Type Testing laboratory Inclusion in the national part of the Unified State Register No

- ACCREDITED PARTY
- SCOPE OF ACCREDITATION
- ACCREDITATION
- STATE SERVICES
- APPLICANT
- ACCREDITED CONFORMITY ASSESSMENT BODY

Type of SA (State Agency)

Making amendments. Other amendments

PK1RA-139 of March 20, 2025 Confirmation of competence PK1RA-139 of March 20, 2025 Confirmation of competence PK1RA-139 of March 20, 2025 Expansion of accreditation scope PK1RA-139 of March 20, 2025 Reduction of accreditation scope by decision of accredited party February 10, 2025 Reduction of accreditation scope by decision of accredited party February 03, 2025 Reduction of accreditation scope by decision of accredited party April 18, 2023 Confirmation of competence PK1RA-119 of March 17, 2023 Expansion of accreditation scope PK1RA-119 of March 17, 2023 Confirmation of competence PK1-511 of April 03, 2020 Expansion of accreditation scope PK1-511 of April 03, 2020 No of decision on making amendments **PK1RA-139** Date of decision on making amendments March 20, 2025

Status Active Unique accreditation record number in the Register of Accredited Conformity Assessment Bodies RA.RU.21HH33 Date of making an entry 15/11/2018 Type Testing laboratory Inclusion in the national part of the Unified Register No

- ACCREDITED PARTY
- SCOPE OF ACCREDITATION
- ACCREDITATION
- STATE SERVICES
- APPLICANT
- ACCREDITED CONFORMITY ASSESSMENT BODY

Applicant type Legal entity Legal entity form Federal state unitary enterprises Full name of legal entity FEDERAL STATE UNITARY ENTERPRISE «RUSSIAN FEDERAL NUCLEAR CENTER-ZABABAKHIN ALL-RUSSIA RESEARCH INSTITUTE OF TECHNICAL PHYSICS» Abbreviated name of legal entity FSUE «RFNC-VNIITF NAMED AFTER ACADEM. E.I. ZABABAKHIN» State enterprise Yes Taxpayer identification number (INN) 7423000572 Tax registration reason code (KPP) 745901001 Primary state registration number (OGRN) 1027401350932 Legal entity location address 456770, RUSSIA, CHELYABINSK REGION, SNEZHINSK, VASILIEVA STREET, 13 Tax office name Interdistrict Inspectorate of the Federal Tax Service 17 for Chelyabinsk Region Date of registration with the tax office June 23, 2015 Legal entity head Zheleznov Mikhail Evgenievich Position of legal entity head Director Legal entity phone number +7 3514655120 Legal entity fax number +7 3514652233 Legal Entity email vniitf@vniitf.ru

Status Active Unique accreditation record number in the Register of Accredited Conformity Assessment Bodies RA.RU.21HH33 Date of making an entry November 15, 2018 Type Testing laboratory Inclusion in the national part of the Unified Register No

- ACCREDITED PARTY
- SCOPE OF ACCREDITATION
- ACCREDITATION
- STATE SERVICES
- APPLICANT

ACCREDITED CONFORMITY ASSESSMENT BODY

Status

Active

Name of accredited conformity assessment body

Ispytatelnyy centr vserossiyskogo elektrotehnicheskogo instituta - filiala federalnogo gosudarstvennogo unitarnogo predpriyatiya "rossiyskiy federalnyy yadernyy centr - vserossiyskiy nauchno-issledovatelskiy institut tehnicheskoy fiziki imeni akademika e.Subclause zababahina"

Applicant name

Federalnoe gosudarstvennoe unitarnoe predpriyatie "rossiyskiy federalnyy yadernyy centr - vserossiyskiy nauchno-issledovatelskiy institut tehnicheskoy fiziki imeni akademika e.i. zababahina"

Type of accredited conformity assessment body

Testing laboratory

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