

Deutsche Akkreditierungsstelle

Annex to the Accreditation Certificate D-PL-12072-04-00 according to DIN EN ISO/IEC 17025:2018

Valid from: 13.03.2024

Date of issue: 13.03.2024

Holder of accreditation certificate:

PEHLA GmbH
Beckstraße 15, 69469 Weinheim

with the location

PEHLA GmbH
PEHLA-Prüffeld Berlin
Paulsternstraße 26, 13629 Berlin

The testing laboratory meets the requirements of DIN EN ISO/IEC 17025:2018 to carry out the conformity assessment activities listed in this annex. The testing laboratory meets additional legal and normative requirements, if applicable, including those in relevant sectoral schemes, provided that these are explicitly confirmed below.

The management system requirements of DIN EN ISO/IEC 17025 are written in the language relevant to the operations of testing laboratories and they conform to the principles of DIN EN ISO 9001.

High-Voltage Switch and Controlgear **Power Engineering Equipment**

The testing laboratory is permitted, without being required to inform and obtain prior approval from DAkkS, to use standards or equivalent testing methods listed here with different issue dates.

The testing laboratory maintains a current list of all testing standards / equivalent testing procedures within the flexible scope of accreditation.

This certificate annex is only valid together with the written accreditation certificate and reflects the status as indicated by the date of issue. The current status of any given scope of accreditation can be found in the directory of accredited bodies maintained by Deutsche Akkreditierungsstelle GmbH at <https://www.dakks.de>.

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Testing field	Standard / Version	Title of Standard	Test range / Restrictions
General			
Electrical engineering	IEC 62271-1:2017 + AMD 1:2021	High-voltage switchgear and controlgear - Part 1: Common specifications for alternating current switchgear and controlgear	
	IEEE 4:2013	IEEE Standard Techniques for High-Voltage Testing	
	IEEE Std C37.20.2:2020	IEEE Standard for Metal-Clad Switchgear	
	IEEE Std C37.20.3:2013	IEEE Standard for Metal-Enclosed Interrupter Switchgear (1 kV - 38 kV)	
	IEEE Std C37.100:1992	IEEE Standard Definitions for Power Switchgear	
	IEEE Std C37.100.1:2018	Common requirements for high voltage power switchgear rated above 1000 V	
	GOST 1516.3-96	Electrical equipment for a.c. voltages from 1 to 750 kV - Requirements for electric strength of insulation	
Circuit-breakers			
Electrical engineering	IEC 62271-100:2021	High-voltage switchgear and controlgear - Part 100: High-voltage alternating-current circuit-breakers	
	IEC 62271-101:2021	High-voltage switchgear and controlgear - Part 101: Synthetic testing	
	IEC 62271-108:2020	High-voltage switchgear and controlgear - Part 108: High-voltage alternating current disconnecting circuit-breakers for rated voltages of 72,5 kV and above	
	IEC 62271-109:2019	High-voltage switchgear and controlgear - Part 109: Alternating-current series capacitor by-pass switches	
	IEC 62271-110:2017	High-voltage switchgear and controlgear - Part 110: Inductive load switching	
	IEC 62271-111:2019 IEEE Std C37.60:2019	High voltage switchgear and controlgear - Part 111: Automatic circuit reclosers for alternating current systems up to and including 38 kV	

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	DIN EN 50152-1:2013 VDE 0115-320-1:2013 EN 50152-1:2013 DIN EN 50152-1/A1:2014 VDE 0115-320-1/A1:2014	Railway applications - Fixed installations - Particular requirements for AC switchgear - Part 1: Single-phase circuit-breakers with Un above 1 kV	
Electrical engineering	DIN EN 50152-2:2013 VDE 0115-320-2:2013 EN 50152-2:2012	Railway applications - Fixed installations - Particular requirements for a.c. switchgear - Part 2: Single-phase disconnectors, earthing switches and switches with Un above 1 kV	
	IEC 60077-1:2017	Railway applications - Electric equipment for rolling stock - Part 1: General service conditions and general rules	
	IEC 60077-2:2017	Railway applications - Electric equipment for rolling stock - Part 2: Electrotechnical components - General rules	
	IEC 60077-4:2017	Railway applications - Electric equipment for rolling stock - Part 4: Electrotechnical components; Rules for AC circuit-breakers	
	IEC/TR 62271-300:2006	High-voltage switchgear and controlgear - Part 300: Seismic qualification of alternating current circuit-breakers	
	IEC/TR 62271-302:2010	Alternating current circuit breakers with internationally non-simultaneous pole operation	
	IEC/TR 62271-310:2008	High-voltage switchgear and controlgear - Part 310: Electrical endurance testing for circuit-breakers of rated voltage 72,5 kV and above	
	IEEE Std C37.04:2018 + CORRIGENDUM 1:2021	IEEE Standard for Ratings and Requirements for AC High-Voltage Circuit Breakers with Rated Maximum Voltage Above 1000 V	
	IEEE C37.06.1:2017	IEEE Recommended Practice for Preferred Ratings for High-Voltage (>1000 volts) AC Circuit Breakers Designated Definite Purpose for Fast Transient Recovery Voltage Rise Times	
IEEE Std C37.09:2018 + CORRIGENDUM 1:2021	IEEE Standard Test Procedure for AC High-Voltage Circuit Breakers with Rated Maximum Voltage Above 1000 V		

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	IEEE Std C37.010:2016	IEEE Application Guide for AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis	
	IEEE Std C37.011:2019	IEEE Guide for the Application of Transient Recovery Voltage for AC High-Voltage Circuit Breakers with Rated Maximum Voltage above 1000 V	
Electrical engineering	IEEE Std C37.012:2014 + CORRIGENDUM 1:2016 IEEE Std. C37.012A:2020	IEEE Guide for the Application of Capacitance Current Switching for AC High-Voltage Circuit Breakers Above 1000 V	
	IEC/IEEE 62271-37-013: 2021	High-voltage switchgear and controlgear - Part 37-013: Alternating current generator circuit-breakers	
	IEEE Std C37.015:2017	IEEE Application Guide for Shunt Reactor Switching	
	IEEE Std C37.016:2018 +CORRIGENDUM 1:2021	AC high-voltage circuit switchers rated 15.5 kV through 245 kV	
	IEEE Std C37.11:2014	IEEE Standard Requirements for Electrical Control for AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis	
	ANSI C37.54:2003	Conformance Test Procedures for Indoor Alternating Current High-Voltage Circuit Breakers Applied as Removable Elements in Metal-Enclosed Switchgear Assemblies	
	CSA C22.2 No. 31-18:2018	Switchgear assemblies	
	GOST R 52565-2006	Alternating-Current Circuit-Breakers for Voltage from 3 to 750 kV	
	IEC 62146-1:2013 + AMD1:2016	Grading capacitors for high-voltage alternating current circuit-breakers - Part 1: General	
Switches			
Electrical engineering	IEC 62271-103:2021	High-voltage switchgear and controlgear - Part 103: Switches for rated voltages above 1 kV up to and including 52 kV	

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	IEC 62271-104:2020	High-voltage switchgear and controlgear - Part 104: Alternating current switches for rated voltages of 52 kV and above	
	IEC 62271-105:2021	High-voltage switchgear and controlgear - Part 105: Alternating current switch-fuse combinations	
Contactors and motorstarters			
Electrical engineering	IEC 62271-106:2021	High-voltage switchgear and controlgear - Part 106: Alternating current contactors, contactor-based controllers and motor-starters	
	UL347:2020 CSA C22.2 No. 253-20:2020 NMX-J-564/106-ANCE:2020	Medium-Voltage AC Contactors, Controllers, and Control Centers	
Disconnectors and earthing switches			
Electrical engineering	IEC 62271-102:2018	High-voltage switchgear and controlgear - Part 102: Alternating current disconnectors and earthing switches	
	IEEE C37.30.1:2011	IEEE Standard Requirements for High-Voltage Switches	
	IEEE C37.41:2016	IEEE Standard Requirements for High-Voltage Switches	
	GOST 52726-2007	Disconnectors and Earthing Switches for AC Voltage above 1 kV and their Drive Units	
Switchgear and controlgear			
Electrical engineering	IEC 62271-200:2021	High-voltage switchgear and controlgear - Part 200: AC metal-enclosed switchgear and controlgear for rated voltages above 1 kV and up to and including 52 kV	
	IEC 62271-201:2014	High-voltage switchgear and controlgear - Part 201: AC insulation-enclosed switchgear and controlgear for rated voltages above 1 kV and up to and including 52 kV	
	IEC 62271-203:2011 CORRIGENDUM 1:2013	High-voltage switchgear and controlgear - Part 203: Gas-insulated metal-enclosed switchgear for rated voltages above 52 kV	

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	IEC 62271-205:2008	High-voltage switchgear and controlgear - Part 205: High-voltage switchgear assemblies for operation at rated voltages above 52 kV	
	IEC 62271-209:2019 + AMD1:2022	High-voltage switchgear and controlgear - Part 209: Cable connections for gas-insulated metal-enclosed switchgear for rated voltages above 52 kV - Fluid-filled and extruded insulation cables - Fluid-filled and dry-type cable-terminations	
	IEC 62271-211:2014	High-voltage switchgear and controlgear - Part 211: Direct connection between power transformers and gas-insulated metal-enclosed switchgear for rated voltages above 52 kV	
	IEEE Std C37.122:2021	IEEE Standard for High Voltage Gas-Insulated Substations Rated Above 52 kV	
	IEEE Std C37.122.1:2014	IEEE Guide for Gas-Insulated Substations Rated Above 52 kV	
Electrical engineering	GOST R 54828-2011	Gas-insulated metal-enclosed switchgear for nominal voltages above 110 kV. General technical specification	
Surge arresters			
Electrical engineering	DIN EN 50526-1:2012 VDE 0115-526-1:2012 EN 50526-1:2012	Railway applications - Fixed installations - D.C. surge arresters and voltage limiting devices - Part 1: Surge arresters	
	DIN EN 60099-1:2000 VDE 0675-1:2000 EN 60099-1:1999	Surge arresters; part 1: non-linear resistor type gapped surge arresters for a.c. systems	
	IEC 60099-4:2014	Surge arresters - Part 4: Metal-oxide surge arresters without gaps for a.c. systems	
	GB/T 11032-2020	Metal-oxide surge arresters without gaps for a.c. systems	
	IEC 60099-8:2017	Surge arresters - Part 8: Metal-oxide surge arresters with external series gap (EGLA) for overhead transmission and distribution lines of a.c. systems above 1 kV	
	IEC 60099-9:2014	Surge arresters - Part 9: Metal-oxide surge arresters without gaps for HVDC converter stations	

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	IEC 61643-11:2011	Low-voltage surge protective devices - Part 11: Surge protective devices connected to low-voltage power distribution systems - Requirements and testing methods	
	IEEE Std C62.11:2020	IEEE Standard for Metal-Oxide Surge Arresters for AC Power Circuits (> 1 kV)	
	CIGRE WG 33/14-05:1989	Application Guide for Metal oxide Arresters without gaps for HVDC Converter Stations	
	GOST R 52725-2007	Surge arresters for AC electrical installations for voltage from 3 kV to 750 kV	
Transmission lines			
Electrical engineering	IEC 62271-204:2011	High-voltage switchgear and controlgear - Part 204: Rigid gas-insulated transmission lines for rated voltage above 52 kV	
	IEC 60353:1989 + AMD1:2002	Line traps for a.c. power systems	
	IEC 61284:1997	Overhead lines - Requirements and tests for fittings	
Electrical engineering	CISPR TR 18-2:2017	Radio interference characteristics of overhead power lines and high-voltage equipment - Part 2: Methods of measurement and procedure for determining limits	
	IEC 60358-1:2012 + CORRIGENDUM 1:2013	Coupling capacitors and capacitor dividers - Part 1: Common clauses	
Transformers, Reactors			
Electrical engineering	IEC 60076-6:2007	Power transformers - Part 6: Reactors	
Instrument transformers			
Electrical engineering	IEC 61869-1:2007	Instrument transformers - Part 1: General requirements	
	IEC 61869-2:2012	Instrument transformers - Part 2: Additional requirements for current transformers	
	IEC 60044-7:1999	Instrument transformers - Part 7: Electronic voltage transformers	
	IEC 60044-8:2002	Instrument transformers - Part 8: Electronic current transformers	

Testing field	Standard / Version	Title of Standard	Test range / Restrictions
	IEEE Std C57.13:2016	Requirements for instrument transformers	
Insulators, Bushings			
Electrical engineering	IEC 60383-1:1993	Insulators for overhead lines with nominal voltage above 1000 V; part 1: ceramic or glass insulator units for a.c. systems; definitions, test methods and acceptance criteria	
	IEC 60383-2:1993	Insulators for overhead lines with a nominal voltage above 1000 V; part 2: insulator strings and insulator sets for a.c. systems; definitions, test methods and acceptance criteria	
	IEC 60137:2017	Insulated bushings for alternating voltages above 1000 V	
	IEC 60168:1994 + AMD1:1997 + AMD2:2000	Tests on indoor and outdoor post insulators of ceramic material or glass for systems with nominal voltages greater than 1000 V	
	IEC 61109:2008	Insulators for overhead lines - Composite suspension and tension insulators for a.c. systems with a nominal voltage greater than 1000 V - Definitions, test methods and acceptance criteria	
	IEC 62217:2012	Polymeric HV insulators for indoor and outdoor use - General definitions, test methods and acceptance criteria	
Electrical engineering	IEC 60437: 1997	Radio interference test on high-voltage insulators	
	IEC 62155:2003	Hollow pressurized and unpressurized ceramic and glass insulators for use in electrical equipment with rated voltages greater than 1000 V	
	IEC TS 60815-1:2008	Selection and dimensioning of high-voltage insulators intended for use in polluted conditions - Part 1: Definitions, information and general principles	
	IEC TS 60815-2:2008	Selection and dimensioning of high-voltage insulators intended for use in polluted conditions - Part 2: Ceramic and glass insulators for a.c. systems	
	DIN 48113:1973	Stützisolatoren für Schaltgeräte und Schaltanlagen für Spannungen über 1 kV; Zuordnung der Begriffe für Biegefestigkeit	

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	IEC 62231:2006	Composite station post insulators for substations with a.c. voltages greater than 1000 V up to 245 kV - Definitions, test methods and acceptance criteria	
	IEC 62231-1:2015	Composite station post insulators for substations with AC voltages greater than 1000 V up to 245 kV - Part 1: Dimensional, mechanical and electrical characteristics	
	IEC 61952:2008	Insulators for overhead lines - Composite line post insulators for A.C. systems with a nominal voltage greater than 1 000 V - Definitions, test methods and acceptance criteria	
	IEC 61462:2007	Composite hollow insulators - Pressurized and unpressurized insulators for use in electrical equipment with rated voltage greater than 1000 V - Definitions, test methods, acceptance criteria and design recommendations	
	ANSI C29.1:2018	Test Methods for Electrical Power Insulators	
	ANSI C29.11:2020	Composite Insulators - Test Methods	
	ANSI C29.12:2020	Insulators - Composite-Suspension Type	
	ANSI C29.13:2012	Insulators - Composite - Distribution Deadend Type	
Electrical engineering	ANSI C29.17:2013	Composite Insulators - Distribution Line Post Type	
High-voltage test techniques			
Electrical engineering	IEC 60060-1:2010	High-voltage test techniques; Part 1: General definitions and test requirements	
	IEC 60060-2:2010	High-voltage test techniques - Part 2: Measuring systems	
	IEC 60270:2000 + AMD1:2015	High-voltage test techniques - Partial discharge measurements	
	IEEE Std C37.301:2009	IEEE Standard for High-Voltage Switchgear (Above 1000 V) Test Techniques—Partial Discharge Measurements	
Mechanical testings, environment- and guardtesting			

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Electrical engineering	IEC 60068-2-14:2009	Environmental testing - Part 2-14: Tests - Test N: Change of temperature	
	IEC 60068-2-17:1994	Basic environmental testing procedures - Part 2: Tests - Test Q: Sealing	
	IEC 60529:1989 + AMD1:1999 + AMD2:2013	Degrees of protection provided by enclosures (IP code)	
	ISO 3744:2010	Acoustics - Determination of sound power levels of noise sources using pressure - Engineering method in an essentially free field over a reflecting plane	
	DIN 45635-1:1984	Measurement of noise emitted by machines; airborne noise emission; enveloping surface method; basic method, divided into 3 grades of accuracy	
	DIN 45635-12:1978	Geräuschmessungen an Maschinen; Luftschallmessung, Hüllflächen-Verfahren, Elektrische Schaltgeräte	
	IEC/IEEE 62271-37-082:2012 IEEE 62271-37-082:2012	High-voltage switchgear and controlgear - Part 37-082: Standard practice for the measurement of sound pressure levels on alternating current circuit-breakers	

Abbreviations used:

ANSI	American National Standards Institute
CDV	Committee draft for vote
CSA	Canadian Standards Association
DIN	German Institute for Standardisation Registered Association
EN	European Standard
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
ISO	International Organization for Standardization
NEMA	National Electrical Manufacturers Association
TS	Technical Specification