Deutsche Akkreditierungsstelle GmbH
(Германски акредитационен орган ГмбХ)

Упълномощен в съответствие с Подраздел 1 на Раздел 8 на AkkStelleG във връзка с Подраздел 1 на Раздел 1 на AkkStelleG
Подписал Многостранните споразумения на ЕА, ILAF и IAF за взаимно признаване

Акредитация

Deutsche Akkreditierungsstelle GmbH (Германски акредитационен орган ГмбХ) удостоверява, че изпитвателната лаборатория

IPH Institut “Prüffeld für elektrische Hochleistungstechnik” GmbH
Landsberger Alee 378 A, 12681 Berlin
(Институт ИПХ „Прюфелд фюр Електрише Хохлайщунгстехник“ ГмбХ
Алея Ландсбергер 378 А, 12681 Берлин)

е компетентна по условията на DIN EN ISO/IEC 17025:2005 да извършва изпитания в следните области:

Апаратура и компоненти за високо напрежение
Апаратура и компоненти за ниско напрежение
Комутационна, защитна и управляваща апаратура
Кабели и кабелни аксесоари за високо, средно и ниско напрежение

Акредитационният сертификат важи във връзка с известието за акредитация от 11.11.2015 г. с акредитационен номер D-PL-12107-01 и е валиден до 10.11.2020 г. Той се състои от заглавния лист, обратната страна на заглавния лист и следващия анекс с общо 42 страници.

Регистрационен номер на сертификата: **D-PL-12107-01-00**

На основание чл.36а ал.3 от ЗОП

Франкфурт на Майн, 11.11.2015 г.

/подпис
инж. Ра
Ръковод

Този документ е превод. Определящата версия е оригиналният германски акредитационен сертификат.

Вж. забележките на обратната страна на листа.

ВЯРНО С
ОРИГИНАЛА

Deutsche Akkreditierungsstelle GmbH
(Германски акредитационен орган ГмбХ)

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10117 Берлин

Офис Франкфурт на Майн
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60327 Франкфурт на Майн

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Бундесалее 100
38116 Брауншвайг

Публикуването на извадки от акредитационния сертификат подлежи на предварително писмено одобрение от Deutsche Akkreditierungsstelle GmbH (DAkkS). Изключение е непромenената форма на отделни разпространения на заглавния лист от споменатия на обратната страна на листа орган за оценка на съответствието.

Не трябва да се създава впечатление, че акредикацията е разширена до области извън обхвата на акредитация , удостоверен от DAkkS.

Акредитацията е дадена съгласно Закона за акредитационния орган (AkkStelleG) от 31 юли 2009 г. (Вестник за федерални закони I стр. 2625) и РЕГЛАМЕНТ (ЕО) № 765/2008 на Европейския парламент и на Съвета от 9 юли 2008 г. за определяне на изискванията за акредитация и надзор на пазара във връзка с предлагането на пазара на продукти (Официален вестник на Европейския съюз L 218 от 9 юли 2008 г., стр. 30). DAkkS е подписал Многостранното споразумение за взаимно признаване на европейското сътрудничество за акредитация (EA), Международния акредитационен форум (IAF) и Международното сътрудничество за акредитиране на лаборатории (ILAC). Подписалите тези споразумения признават взаимно своите акредитации.

Текущото състояние на членството може да бъде намерено на следните уебсайтове:
EA: www.european-accreditation.org
ILAC: www. ilac.org
IAF: www.iaf.nu

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DAkkS
Deutsche
Akkreditierungsstelle

Deutsche Akkreditierungsstelle GmbH

Entrusted according to Section 8 subsection1 AkkStelleG in connection with Section 1 subsection 1 AkkStelleGBV
Signatory to the Multilateral Agreements of
EA, ILAC and IAF for Mutual Recognition

Accreditation

The Deutsche Akkreditierungsstelle GmbH attests that the testing laboratory

IPH Institut "Prüffeld für elektrische Hochleistungstechnik" GmbH
Landsberger Allee 378 A, 12681 Berlin

is competent under the terms of DIN EN ISO/IEC 17025:2005 to carry out tests in the following fields:

High-voltage equipment and components
Low-voltage equipment and components
Installation, switching, control and protective equipment
High-voltage, medium-voltage and low-voltage cables and their accessories

The accreditation certificate shall only apply in connection with the notice of accreditation of 2015-11-11 with the accreditation number D-PL-12107-01 and is valid until 2020-11-10. It comprises the cover sheet, the reverse side of the cover sheet and the following annex with a total of 42 pages.

Registration number of the certificate: **D-PL-12107-01-00**

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Frankfurt, 2015-11-11

Dipl.-Ing. (FH) Ralf Egner
Head of Division

This document is a translation. The definitive version is the original German accreditation certificate.

See notes overleaf.

Deutsche Akkreditierungsstelle GmbH

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Spittelmarkt 10
10117 Berlin

Office Frankfurt am Main
Gartenstraße 6
60594 Frankfurt am Main

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38116 Braunschweig

The publication of extracts of the accreditation certificate is subject to the prior written approval by Deutsche Akkreditierungsstelle GmbH (DAkkS). Exempted is the unchanged form of separate disseminations of the cover sheet by the conformity assessment body mentioned overleaf.

No impression shall be made that the accreditation also extends to fields beyond the scope of accreditation attested by DAkkS.

The accreditation was granted pursuant to the Act on the Accreditation Body (AkkStelleG) of 31 July 2009 (Federal Law Gazette I p. 2625) and the Regulation (EC) No 765/2008 of the European Parliament and of the Council of 9 July 2008 setting out the requirements for accreditation and market surveillance relating to the marketing of products (Official Journal of the European Union L 218 of 9 July 2008, p. 30). DAkkS is a signatory to the Multilateral Agreements for Mutual Recognition of the European co-operation for Accreditation (EA), International Accreditation Forum (IAF) and International Laboratory Accreditation Cooperation (ILAC). The signatories to these agreements recognise each other's accreditations.

The up-to-date state of membership can be retrieved from the following websites:
EA: www.european-accreditation.org
ILAC: www.ilac.org
IAF: www.iaf.nu

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Deutsche Akkreditierungsstelle GmbH

Annex to the Accreditation Certificate D-PL-12107-01-00 according to DIN EN ISO/IEC 17025:2005

Period of validity: 2015-11-11 to 2020-11-10 Date of issue: 2015-11-11

Holder of certificate:

IPH Institut "Prüffeld für elektrische Hochleistungstechnik" GmbH
Landsberger Allee 378 A, 12681 Berlin

Tests in the fields:

High-voltage equipment and components
Low-voltage equipment and components
Railway applications
Installation, switching control and protective equipment
High-voltage, medium-voltage and low-voltage cables and their accessories

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.

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Testing of high-voltage equipment and components as described in the subsequent listed standards			
High-voltage Switchgear, Control gear and Assemblies (general)			
Electrical engineering	IEC 62271-1 (2011-08) Ed. 1.1 EN 62271-1:2008/A1:2011 DIN EN 62271-1 VDE 0671-1/A1): 2012-04	High-voltage switchgear and controlgear – Part 1: Common specifications	

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
High-voltage Switchgear and Control gear			
Electrical engineering	IEC 62271-100 (2012-09) Ed. 2.1 STL-Guide EN 62271-100:2009 + A1:2012 DIN EN 62271-100:2013-08 VDE 0671-100	High-voltage switchgear and controlgear – Part 100: High-voltage alternating-current circuit-breakers	
Electrical engineering	IEC 62271-101 (2012-10) Ed. 2.0 STL-Guide EN 62271-101:2013 DIN EN 62271-101:2013-08 VDE 0671-101	High-voltage switchgear and controlgear – Part 101: Synthetic testing	
Electrical engineering	IEC 62271-108 (2005-10) Ed. 1.0 EN 62271-108:2006 DIN EN 62271-108:2006-10 VDE 0671-108	High-voltage switchgear and controlgear – Part 108: High-voltage alternating current disconnecting circuit-breakers for rated voltages of 72,5 kV and above	
Electrical engineering	IEC 62271-109 EN 62271-109:2009 + A1:2013 DIN EN 62271-109:2014-02 VDE 0671-109	High-voltage switchgear and controlgear – Part 109: Alternating-current series capacitor by-pass switches	
Electrical engineering	IEC 62271-110 (2012-09) Ed. 3.0 EN 62271-110:2012 DIN EN 62271-110:2013-08 VDE 0671-110	High-voltage switchgear and controlgear – Part 110: Inductive load switching	
Electrical engineering	IEEE C37.60-2012 IEC 62271-111 (2012-09) Ed. 2.0 VDE 0671-111	Overhead, pad-mounted, dry vault, and submers-ible automatic circuit reclosersand fault interrupters for alternating current systems up to 38 kV.	
Electrical engineering	IEC 62271-205 EN 62271-205:2008 DIN EN 62271-205:2008-12 VDE 0671-205	High-voltage switchgear and controlgear – Part 205: Compact switchgear assemblies for rated voltages above 52 kV.	

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Load switches			
Electrical engineering	IEC 62271-103 DIN IEC 62271-103 EN 62271-103:2011 DIN EN 62271-103:2012-04 VDE 0671-103 STL-Guide	High-voltage switchgear and controlgear – Part 103: Switches for rated voltages above 1 kV up to and including 52 kV.	
Electrical engineering	IEC 62271-104 (2015-02) Ed. 2.0 EN 62271-104:2009 DIN EN 62271-104:2010-03 VDE 0671-104	High-voltage switchgear and controlgear – Part 104: Alternating current switches for rated voltages higher than 52 kV.	
Electrical engineering	IEC 62271-105 (2012-09) Ed. 2.0 EN 62271-105:2012 DIN EN 62271-105:2013-08 VDE 0671-105	High-voltage switchgear and controlgear – Part 105: Alternating current switch-fuse combinations for rated voltages above 1 kV up to and including 52 kV.	
Electrical engineering	IEC 62271-107 (2012-05) Ed. 2.0 EN 62271-107:2012 DIN EN 62271-107:2013-03 VDE 0671-107	High-voltage switchgear and controlgear – Part 107: Alternating current fused circuit-switchers for rated voltages above 1 kV up to and including 52 kV.	
Current contactors and motor starters			
Electrical engineering	IEC 62271-106 (2014-02) Ed. 1.0 + Corr 1 EN 62271-106:2011 DIN IEC 62271-106:2012-06 VDE 0671-106	High-voltage alternating current contactors and contactor-based motor starters.	
Current disconnectors and earthing switches			
Electrical engineering	IEC 62271-102 (2013-02) Ed. 1.0 + am2 EN 62271-102:2002/A2:2013 DIN EN 62271-102/A2:2013-12 VDE 0671-102/A2	High-voltage switchgear and controlgear – Part 102: Alternating current disconnectors and earthing switches.	

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Fuses			
Electrical engineering	IEC 60282-1 (2014-07) Ed. 7.1 STL-Guide EN 60282-1:2009 + A1:2014 DIN EN 60282-1:2015-05 VDE 0670-4	High-voltage fuses – Part 1: Current-limiting fuses.	
Electrical engineering	IEC 60282-2 (2008-04) Ed. 3.0	High-voltage fuses; – Part 2: Expulsion fuses	
Electrical engineering	IEC 60644 (2009-08) Ed. 2.0 EN 60644:2009 DIN EN 60644:2010-07 VDE 0670-401	Specification for high-voltage fuse-links for motor circuit applications.	
High-voltage switchgear and control gear assemblies			
Electrical engineering	IEC 62271-200 (2011-10) Ed. 2.0 STL- Guide EN 62271-200:2012 DIN EN 62271-200:2012-08 VDE 0671-200	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.	
Electrical engineering	IEC 62271-201 (2014-03) Ed. 2.0 EN 62271-201:2014 DIN EN 62271-201:2015-03 VDE 0671-201	High-voltage switchgear and controlgear – Part 201: A.C. insulation-enclosed switchgear and controlgear for rated voltages above 1 kV and up to and including 52 kV.	
Electrical engineering	IEC 62271-203 (2013-07) Ed. 2.0 + Corr. 1 STL-Guide EN 62271-203:2012 DIN EN 62271-203:2012-11 VDE 0671-203	High-voltage switchgear and controlgear – Part 203: Gas-insulated metal-enclosed switchgear for rated voltages above 52 kV.	
Electrical engineering	IEC 62271-204 (2011-07) Ed. 1.0 STL-Guide EN 62271-204:2011 DIN EN 62271-204:2012-05 VDE 0671-204	High-voltage switchgear and controlgear – Part 204: Rigid gas-insulated transmission lines for rated voltage above 52 kV.	

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	IEC 62271-209 (2007-08) Ed. 1.0 EN 62271-209:2007 DIN EN 62271-209:2008-07 VDE 0671-209	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.	
Electrical engineering	IEC 62271-202 EN 62271-202:2014 + AC:2014 DIN EN 62271-202:2015-02 VDE 0671-202	High-voltage switchgear and controlgear – Part 202: High voltage / low voltage prefabricated substation.	
Electrical engineering	IEC 62271-205 (2008-01) Ed. 1.0 EN 62271-205:2008 DIN EN 62271-205:2008-12 VDE 0671-205	High-voltage switchgear and controlgear – Part 205: Compact switchgear assemblies for rated voltages above 52 kV.	
Electrical engineering	ANSI / IEEE C37.23-2003	IEEE Standard for Metal-Enclosed Bus	
Switch gear for direct current			
Electrical engineering	DIN VDE 0660-112:1987-02 VDE 0660-112	Schaltgeräte; Zusatzbestimmungen für Gleichstrom-Lastschalter, -Trenner und -Lasttrenner über 1200 V bis 3000 V.	
Power transformers, reactors, line traps, tap-changers			
Electrical engineering	IEC 60076-1 (2011-04) Ed. 3.0 EN 60076-1:2011 DIN EN 50076-1:2012-03 VDE 0532-76-1	Power transformers – Part 1: General.	
Electrical engineering	IEC 60076-2 (2011-02) Ed. 3.0 EN 60076-2:2011 DIN EN 60076-2:2012-02 VDE 0532-76-2	Power transformers – Part 2: Temperature rise for liquid-immersed transformers.	
Electrical engineering	IEC 60076-3 (2013-07) Ed. 3.0 EN 60076-3:2013 DIN EN 60076-3:2014-08 VDE 0532-76-3	Power transformers – Part 3: Insulation levels, dielectric tests and external clearances in air.	

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Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	VDE 0532-76 -4 DIN EN 60076-4:2003-06 IEC 60076-4 (2002-06) Ed. 1.0	Power transformers – Part 4: Guide to the lightning impulse and switching impulse testing - Power transformers and reactors.	
Electrical engineering	IEC 60076-5 (2006-02) Ed. 3.0 STL-Guide EN 60076-5:2006 DIN EN 60076-5:2007-01 VDE 0532-76-5	Power transformers – Part 5: Ability to withstand short circuit.	
Electrical engineering	IEC 60076-6 (2007-12) Ed. 1.0 EN 60076-6:2008 DIN EN 60076-6:2009-02 VDE 0532-76-6	Power transformers – Part 6: Reactors.	
Electrical engineering	IEC 60076-10 (2001-05) Ed. 1.0 IEC 60076-10-1 (2005-10) Ed. 1.0 EN 60076-10:2001 DIN EN 60076-10:2002-04 VDE 0532-76-10	Power transformers – Part 10-1: Determination of sound levels (+ Application guide).	
Electrical engineering	IEC 60076-11 (2004-05) Ed. 1.0 EN 60076-11:2004 DIN EN 60076-11:2005-04 VDE 0532-76-11	Power transformers – Part 11: Dry-type transformers.	
Electrical engineering	IEC 60076-13 EN 60076-13:2006 DIN EN 60076-13:2007-07 VDE 0532-76-13	Power transformers – Part 13: Self-protected liquid-filled transformers.	
Electrical engineering	DIN 57532-21:1982-03 VDE 0532-21	Transformatoren und Drosselspulen; Anlasstransformatoren und Anlassdrosselspulen	
Electrical engineering	VDE 0532 Teil 30 DIN EN 60214:2015-04 IEC 60214-1 (2014-05) Ed. 2.0	Tap-changer	

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	VDE 0851 IEC 60353 (2004-04) Ed. 2.0	Line traps for a.c. power systems.	
Instrument transformers			
Electrical engineering	IEC 61869-1 (2007-10) Ed. 1.0 EN 61869-1:2009 DIN EN 61869-1:2010-04 VDE 0414-9-1	Instrument transformers – Part 1: General requirements.	
Electrical engineering	IEC 61869-2(2012-09) Ed. 1.0 EN 61869-2:2012 DIN EN 61869-2:2013-07 + Ber. VDE 0414-9-2	Instrument transformers – Part 2: Additional requirements for current transformers.	
Electrical engineering	IEC 61869-3 (2011-07) Ed. 1.0 EN 61869-3:2011 DIN EN 61869-3:2012-05 VDE 0414-9-3	Instrument transformers – Part 3: Additional requirements for inductive voltage transformers.	
Electrical engineering	IEC 61869-4 (2013-11) Ed. 1.0 EN 61869-4:2014 DIN EN 61869-4:2015-04 VDE 0414-9-4	Instrument transformers – Part 4: Additional requirements for combined transformers.	
Electrical engineering	VDE 0414-9-5 DIN EN 61869-5:2012-05 IEC 61869-5 (2015-08) Ed. 1.0	Capacitive Voltage Transformers.	
Electrical engineering	VDE 0414-44-8 DIN EN 60044-8:2003-06 IEC 60044-8 (2002-07) Ed.1.0 IEC 61869-8	Instrument transformers – Part 8: Electronic current transformers	
Electrical engineering	IEC 60044-7 (1999-12) Ed. 1.0 EN 60044-7:2000-11 DIN EN 60044-7:2000-11 VDE 0414-44-7 IEC 61869-7	Instrument transformers – Part 7: Electronic voltage transformers.	
Capacitors			
Electrical engineering	DIN VDE 0560-1:1969-12 VDE 0560-1	Bestimmungen für Kondensatoren – Teil 1: Allgemeine Bestimmungen.	

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Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	IEC 60252-1 (2013-08) Ed. 2.1 EN 60252-1:2011 + A1:2013 DIN EN 60252-1:2014-07 VDE 0560-8	AC motor capacitors – Part 1: General - Performance, testing and rating - Safety requirements - Guidance for installation and operation.	
Electrical engineering	IEC 60110-1 (1998-06) Ed. 1.0 EN 60110-1:1998 DIN EN 61110-1:1999-09 VDE 0560-9	Power capacitors for induction heating installations – Part 1: General.	
Electrical engineering	DIN VDE 0560-10:1964-10 VDE 0560-10	Regeln für Kondensatoren – Teil 10: Regeln für Hochfrequenz-Leistungskondensatoren.	
Electrical engineering	DIN VDE 0560-11:1970-05 VDE 0560-11	Regeln für Kondensatoren – Teil 11: Regeln für Kondensatoren ab 600 V zum Glätten pulsierender Gleichspannung.	
Insulators and bushings			
Electrical engineering	DIN VDE 0441-1:1985-07 VDE 0441-1	Prüfung von Kunststoff-Isolatoren für Betriebswechselspannungen über 1 kV; Prüfung von Werkstoffen für Freiluftisolatoren.	
Electrical engineering	IEC 60660 (1999-10) Ed. 2.0 EN 60660:1999 DIN EN 60660:2000-12 VDE 0441-3	Insulators – Tests on indoor post insulators of organic material for systems with nominal voltages greater than 1000 V up to but not including 300 kV.	
Electrical engineering	IEC 60383-1 (1993-04) Ed. 4.0 EN 60383-1:1996 DIN EN 60383-1:1997-05 VDE 0446-1	Insulators for overhead lines with a nominal voltage above 1000 V – Part 1: Ceramic or glass insulator units for a.c. systems - Definitions, test methods and acceptance criteria.	
Electrical engineering	IEC 60383-2 (1993-04) Ed. 1.0 EN 60383-2:1995 DIN EN 60383-2:1995-08 VDE 0446-4	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.	

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Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	IEC 60168 (2001-04) Ed. 4.2 EN 60168:1994 DIN EN 60168:2001-12 VDE 0674-1	Tests on indoor and outdoor post insulators of ceramic material or glass for systems with nominal voltages greater than 1000 V.	
Electrical engineering	IEC 62155 (2003-05) Ed. 1.0 EN 62155:2003 DIN EN 62155:2004 VDE 0674-200	Hollow pressurized and unpressurized ceramic and glass insulators for use in electrical equipment with rated voltages greater than 1000 V.	
Electrical engineering	IEC 60137 (2008-07) Ed. 6.0 EN 60137:2008 DIN EN 60137:2009-07 VDE 0674-5	Insulated bushings for alternating voltages above 1000 V.	
Overhead lines			
Electrical engineering	IEC 61284 (1997-09) Ed. 2.0 + Corr. EN 61284:1997 DIN EN 61284:1998-05 VDE 0212-1	Overhead lines – Requirements and tests for fittings.	
Electrical engineering	IEC 61854 (1998-09) Ed. 1.0 EN 61854:1998 DIN EN 61854:1999-08 VDE 0212-2	Overhead lines – Requirements and tests for spacers.	
Electrical engineering	IEC 61897 (1998-09) Ed. 1.0 EN 61897:1998 DIN EN 61897:1999-08 VDE 0212-3	Overhead lines – Requirements and tests for Stockbridge type aeolian vibration dampers.	

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	DIN VDE 0216:1986-2 VDE 0216	Armaturen für Fahrleitungsanlagen; Statisch-mechanisches Verhalten – Anforderungen, Prüfung.	
HVDC Thyristor valves			
Electrical engineering	IEC 60700-1 (2008-11) Ed. 1.2 EN 60700-1:1998 + A1:2003 + A2:2008 DIN EN 60700-1:2009-07 VDE 0553-1	Thyristor valves for high voltage direct current (HVDC) power transmission – Part 1: Electrical testing.	
Equipment for operating, testing, marking off, live working. Equipment for earthing, short-circuiting.			
Electrical engineering	DIN VDE 0681-1:1986-10 VDE 0681-1	Geräte zum Betätigen, Prüfen und Abschranken unter Spannung stehender Teile mit Nennspannungen über 1 kV; Allgemeine Festlegungen.	
Electrical engineering	DIN 57681-2:1977-03 DIN VDE 0681-2:1977-03 VDE 0681-2	Geräte zum Betätigen, Prüfen und Abschranken unter Spannung stehender Teile mit Nennspannungen über 1 kV; Schaltstangen.	
Electrical engineering	DIN 57681-3:1977-03 DIN VDE 0681-3 VDE 0681-3	Geräte zum Betätigen, Prüfen und Abschranken unter Spannung stehender Teile mit Nennspannungen über 1 kV; Sicherungszangen.	
Electrical engineering	DIN VDE 0681-6:1985-06 VDE 0681-6	Geräte zum Betätigen, Prüfen und Abschranken unter Spannung stehender Teile mit Nennspannungen über 1 kV; Spannungsprüfer für Oberleitungsanlagen elektrischer Bahnen; 15 kV, 16 2/3 Hz.	
Electrical engineering	DIN VDE 0681-8:2003-10 VDE 0681-8	Geräte zum Betätigen, Prüfen und Abschranken unter Spannung stehender Teile mit Nennspannungen über 1 kV; Isolierende Schutzplatten.	

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Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	IEC 60832-1 (2010-02) Ed. 1.0 EN 60832-1:2010 + Cor.:2010 DIN EN 60832-1:2010-12 VDE 0682-211	Live working – Insulating sticks and attachable devices – Part 1: Insulating sticks.	
Electrical engineering	IEC 61229 (2002-06) Ed. 1.2 EN 61229:1995/A2:2002 DIN EN 61229/A2:2003-09 VDE 0682-551 /A2	Rigid protective covers for live working on a.c. installations.	
Electrical engineering	IEC 61230 (2008-07) Ed. 2.0 EN 61230:2008 DIN EN 61230:2009-07 VDE 0683-100	Live working – Portable equipment for earthing or earthing and short-circuiting.	
Electrical engineering	IEC 61219 (1993-10) Ed. 1.0 + Cor.200-05 EN 61219:1993 DIN EN 61219:1995-01 VDE 0683-200	Live working – Earthing or earthing and short-circuiting equipment using lances as a short-circuiting device – Lance earthing.	
High-voltage test techniques			
Electrical engineering	IEC 60270 (2000-12) Ed. 3.0 + Cor.1 EN 60270:2001 + Ber. DIN EN 60270:2001-08 + Ber. VDE 0434	High-voltage test techniques – Partial discharge measurements.	
Electrical engineering	IEC 60060-1 (2010-09) Ed. 3.0 STL-Guide HD 558.1 S1 EN 60060-1:2010 DIN EN 60060-1:2011-10 VDE 0432-1	High-voltage test techniques – Part 1: General definitions and test requirements.	
Electrical engineering	IEC 60060-2 (2010-11) Ed. 3.0 EN 60060-2:2011 DIN EN 60060-2:2011-10 VDE 0432-2	High-voltage test techniques – Part 2: Measuring systems.	

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	VDE 0432-3 DIN-EN 60060-3:2006-08 IEC 60060-3 (2006-02) Ed. 1.0	High-voltage test techniques – Part 3: Definitions and requirements for on-site testing	
Electrical engineering	IEC 60052 (2002-10) Ed. 3.0 EN 60052:2002 DIN EN 60052:2003-06 VDE 0432-9	Voltage measurement by means of standard air gaps.	
Environmental and protection degree testing			
Electrical engineering	IEC 60068-2-78 (2012-10) Ed. 2.0 EN 60068-2-78:2013 DIN EN 60068-2-78:2014-02 VDE 0468-2-78	Environmental testing – Part 2-78: Tests – Test Cab: Damp heat, steady state.	
Electrical engineering	IEC 60068-3-4 (2001-08) Ed. 1.0	Environmental testing – Part 3-4: Supporting documentation and guidance – Damp heat tests.	
Electrical engineering	IEC 60068-2-30 (2005-08) Ed. 3.0	Environmental testing – Part 2-30: Tests – Test Db: Damp heat, cyclic (12 h + 12 h cycle).	
Electrical engineering	IEC 60068-2-75 (2014-09) Ed. 2.0	Environmental testing – Part 2-75: Tests – Test Eh: Hammer tests.	

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Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Testing of low-voltage equipment and components as well as of installation, switching, control and protective equipment and railway applications as described in the subsequent listed standards.			
Railway applications			
Electrical engineering	VDE 0115 - 300-1 DIN EN 50123-1:2003-12 EN 50123-1:2003 IEC 61992-1 (2014-04) Ed. 2.1	Railway applications – Fixed installations – DC switchgear – Part 1: General.	
Electrical engineering	VDE 0115 - 300-2 DIN EN 50123-2:11-2003 EN 50123-2:2003 IEC 61992-2 (2014-04) Ed. 2.1	Railway applications – Fixed installations – DC switchgear – Part 2: DC circuit-breakers.	
Electrical engineering	VDE 0115 - 300-3 DIN EN 50123-3:10-2003 EN 50123-3:2003 IEC 61992-3 (2006-02) Ed. 2.0	Railway applications – Fixed installations – DC switchgear – Part 3: Indoor d.c. disconnectors, switch-disconnectors and earthing switches.	
Electrical engineering	VDE 0115 - 300-4 DIN EN 50123-4/A1 02-2014 EN 50123-4/A1:2013 IEC 61992-4 (2006-02) Ed 1.0	Railway applications – Fixed installations – DC switchgear – Part 4: Outdoor d.c. disconnectors, switch-disconnectors and earthing switches.	
Electrical engineering	IEC 61992-5 (2006-02) Ed. 1.0 DIN EN 50526-1:2012 VDE 0115-526-1:2012 EN 50526-1:2012	Railway applications – Fixed installations – DC switchgear – Part 5: Surge arresters and low-voltage limiters for specific use in d.c. systems.	
Electrical engineering	DIN EN 50526-2:2014 VDE 0115-526-2:2014 EN 50526-2:2014	Bahnanwendungen – Ortsfeste Anlagen – Überspannungsableiter und Spannungsbegrenzungseinrichtungen für Gleichspannungsnetze – Teil 2: Spannungsbegrenzungseinrichtungen.	
Electrical engineering	VDE 0115 - 300-6 DIN EN 50123-6:09-2003 EN 50123-6:2003 IEC 61992-6 (2014-04) Ed. 1.1	Railway applications – Fixed installations – DC switchgear – Part 6: DC switchgear assemblies.	

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	VDE 0115 Teil 420 DIN EN 60310:2005-01 IEC 60310 (2004-02) Ed. 3.0	Railway applications – Traction transformers and inductors on board rolling stock.	
Electrical engineering	IEC 60077-1 (1999-10) Ed. 1.0 DIN EN 60077-1:2003-04 VDE 0115-460-1	Railway applications – Electric equipment for rolling stock – Part 1: General service conditions and general rules.	
Electrical engineering	IEC 60077-2 (1999-03) Ed. 1.0 DIN EN 60077-2:2003-04 VDE 0115-460-2	Railway applications – Electric equipment for rolling stock – Part 2: Electrotechnical components – General rules.	
Electrical engineering	IEC 60077-3 (2001-12) Ed. 1.0 DIN EN 60077-3:2003-04 VDE 0115-460-3	Railway applications – Electric equipment for rolling stock – Part 3: Electrotechnical components – Rules for d.c. circuit-breakers.	
Electrical engineering	IEC 60077-4 (2003-02) Ed. 1.0 DIN EN 60077-4:2004-01 VDE 0115-460-4	Railway applications – Electric equipment for rolling stock – Part 4: Electrotechnical components – Rules for AC circuit-breakers.	
Electrical engineering	IEC 60077-5 (2003-07) Ed. 1.0 DIN EN 60077-5:2004-07 VDE 0115-460-5	Railway applications – Electric equipment for rolling stock – Part 5: Electrotechnical components – Rules for HV fuses.	
Electrical engineering	VDE 0115-327 DIN EN 50327:2006-03 EN 50327:2006-03 IEC 62589 (2010-07) Ed. 1.0	Railway applications – Fixed installations – Harmonisation of the rated values for converter groups and tests on converter groups.	
Electrical engineering	VDE 0115-328 DIN EN 50328:2010-11 EN 50328:2010-11 IEC 62590 (2010-06) Ed. 1.0	Railway applications – Fixed installations – Electronic power converters for substations.	

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Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	VDE 0560-700 DIN EN 61921:2004-02 EN 61921:2003-07 IEC 61921 (2003-04) Ed. 1.0	Power capacitors Low-voltage power factor correction banks.	
Electrical engineering	VDE 0115 - 410 DIN EN 61287-1:2014-12 EN 61278-1:2014-07 IEC 61287-1 (2014-07) Ed. 3.0	Railway applications – Power convertors installed on board rolling stock – Part 1: Characteristics and test methods.	
Low-voltage switchgear and control gear			
Electrical engineering	VDE 0660 - 100 DIN EN 60947-1:2011-10 EN 60947-1:2011 IEC 60947-1 (2014-09) Ed. 5.2	Low-voltage switchgear and control gear – Part 1: General rules.	
Electrical engineering	VDE 0660 - 101 DIN EN 60947-2:2014-01 EN 60947-2:2013 IEC 60947-2 (2013-01) Ed. 4.2	Low-voltage switchgear and control gear – Part 2: Circuit-breakers.	
Electrical engineering	VDE 0660 - 107 DIN EN 60947-3:2015:03 EN 60947-3:2009 IEC 60947-3 (2012-09) Ed. 3.1	Low-voltage switchgear and control gear – Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units.	
Electrical engineering	VDE 0660 - 102 DIN EN 60947-4-1:2014-02 EN 60947-4-1:2012 IEC 60947-4-1 (2012-07) Ed. 3.1	Low-voltage switchgear and control gear – Part 4-1: Contactors and motor-starters – Electromechanical contactors and motor-starters.	
Electrical engineering	VDE 0660 - 117 DIN EN 60947-4-2:2013-05 EN 60947-4-2:2012 IEC 60947-4-2 (2012-03) Ed. 3.0	Low-voltage switchgear and control gear – Part 4-2: Contactors and motor-starters – AC semiconductor motor controllers and starters.	
Electrical engineering	VDE 0660 - 109 DIN EN 60947-4-3:2015-04 EN 60947-4-3:2014 IEC 60947-4-3 (2014-05) Ed. 2.0	Low-voltage switchgear and controlgear – Part 4-3: Contactors and motor-starters – AC semiconductor controllers and contactors for non-motor loads.	

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Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	VDE 0660 - 200 DIN EN 60947-5-1:2010-04 EN 60947-5-1:2009 IEC 60947-5-1 (2009-07) Ed. 3.1	Low-voltage switchgear and control gear – Part 5-1: Control circuit devices and switching elements – Electromechanical control circuit devices.	
Electrical engineering	VDE 0660 - 208 DIN EN 60947-5-2:2014-01 EN 60947-5-2:2012 IEC 60947-5-2 (2012-09) Ed. 3.1	Low-voltage switchgear and controlgear – Part 5-2: Control circuit devices and switching elements – Proximity switches.	
Electrical engineering	VDE 0660 - 210 DIN EN 60947-5-5:2005-11 EN 60947-5-5:2005 IEC 60947-5-5 (2005-04) Ed. 1.1	Low-voltage switchgear and controlgear – Part 5-5: Control circuit devices and switching elements – Electrical emergency stop device with mechanical latching function.	
Electrical engineering	VDE 0660 - 114 DIN EN 60947-6-1:2014-09 EN 60947-6-1:2014 IEC 60947-6-1 (2013-12) Ed. 2.1	Low-voltage switchgear and controlgear – Part 6-1: Multiple function equipment – Transfer switching equipment.	
Electrical engineering	VDE 0660 - 115 DIN EN 60947-6-2:2007-12 EN 60947-6-2:2007 IEC 60947-6-2 (2007-03) Ed. 2.1	Low-voltage switchgear and controlgear – Part 6-2: Multiple function equipment – Control and protective switching devices (or equipment) (CPS).	
Electrical engineering	VDE 0611 - 1 DIN EN 60947-7-1:2010-03 EN 60947-7-1:2009 IEC 60947-7-1 (2009-04) Ed. 3.0	Niederspannungsschaltgeräte – Teil 7.1: Hilfseinrichtungen: Reihenklemmen für Kupferleiter. Low-voltage switchgear and controlgear – Part 7-1: Ancillary equipment – Terminal blocks for copper conductors.	
Electrical engineering	VDE 0611 - 3 DIN EN 60947-7-2:2010-03 EN 60947-7-2:2009 IEC 60947-7-2 (2009-04) Ed. 3.0	Low-voltage switchgear and controlgear – Part 7-2: Ancillary equipment – Protective conductor terminal blocks for copper conductors.	
Electrical engineering	VDE 0611 - 4 DIN VDE 0611- 4:1991-02	Niederspannungsschaltgeräte; Mehrstöckige Verteiler-Reihenklemmen bis 6 mm^2	

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Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	VDE 0637 - 3 DIN EN 61095:2009-11 EN 61095:2009 IEC 61095 (2009-02) Ed. 2.0	Electromechanical contactors for household and similar purposes.	
Electrical engineering	VDE 0220-100 DIN EN 61238-1:2004-03 IEC 61238-1 (2003-05) Ed. 2.0	Compression and mechanical connectors for power cables for rated voltages up to 30 kV (Um = 36 kV) – Part 1: Test methods and requirements.	
Fuses			
Electrical engineering	DIN EN 60269-1:2015-05 IEC 60269-1 (2014-06) Ed. 4.2 VDE 0636-1	Low-voltage fuses – Part 1: General requirements	
Electrical engineering	DIN VDE 0636-2:2014-09 IEC 60269-2 (2013-07(Ed. 5.0 HD 60269-2:2013 VDE 0636-2	Low-voltage fuses – Part 2: Supplementary requirements for fuses for use by authorized persons (fuses mainly for industrial application) - Examples of standardized systems of fuses A to K	
Electrical engineering	DIN VDE 0636-3:2013-12 IEC 60269-3 (2013-01) Ed. 4.1 HD 60269-2:2013 VDE 0636-3	Low-voltage fuses – Part 3: Supplementary requirements for fuses for use by unskilled persons (fuses mainly for household or similar applications) - Examples of standardized systems of fuses A to F	
Electrical engineering	DIN EN 60269-4:2013-01 EN 60269-4:2012 IEC 60269-4 (2012-05) Ed. 5.1 VDE 0636-4	Low-voltage fuses – Part 4: Supplementary requirements for fuse-links for the protection of semiconductor devices	
Electrical engineering	DIN CLC 60269-5 IEC/TR 60269-5 (2014-03) Ed. 2.0 VDE 0636-5	Low-voltage fuses – Part 5: Guidance for the application of low-voltage fuses	
Electrical engineering	DIN EN 60269-6:2012-06 EN 60269-6:2011 IEC 60269-6 (2010-12) Ed. 1.0 + Cor. 1 VDE 0636-6	Low-Voltage fuses – Part 6: Supplementary requirements for fuse-links for the protection of solar photovoltaic energy systems	

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	IEC 60127-1 (2015-02) Ed. 2.2	Miniature fuses – Part 1: Definitions for miniature fuses and general requirements for miniature fuse-links.	
Electrical engineering	IEC 60127-2 (2014-09) Ed. 3.0	Miniature fuses – Part 2: Cartridge fuse-links.	
Power Transformers and Reactors			
Electrical engineering	VDE 0532-76-1 DIN EN 60076-1:2012-03 EN 60076-1:2011 IEC 60076-1 (2011-04) Ed. 3.0	Power transformers – Part 1: General.	
Electrical engineering	VDE 0532-76-2 DIN EN 60076-2:2012-02 EN 60076-2:2011 IEC 60076-2 (2011-02) Ed. 3.0	Power transformers – Part 2: Temperature rise for liquid-immersed transformers.	
Electrical engineering	VDE 0532-76-5 DIN EN 60076-5:2007-01 EN 60076-5:2006 IEC 60076-5 (2006-02) Ed. 3.0	Power transformers – Part 5: Ability to withstand short circuit.	
Electrical engineering	VDE 0532-76-6 DIN EN 60076-6:2009-02 EN 60076-6:2008 IEC 60076-6 (2013-09) Ed. 1.0	Power transformers – Part 6: Reactors.	
Electrical engineering	VDE 0532-214-1 DIN EN 60214-1:2015-04 EN 60214-1:2014 IEC 60214-1 (2014-05) Ed. 2.0	Tap-changers – Part 1: Performance requirements and test methods.	
Electrical engineering	IEC 60353 (2002-04) Ed. 2.0	Line traps for a.c. power systems.	
Electrical Installation Material			
Electrical engineering	VDE 0220 -3	Kabelklemmen	
Electrical engineering	VDE 0603-1 DIN VDE 0603-1:1991-01	Installationskleinverteiler und Zählerplätze AC 400 V; Installationskleinverteiler und Zählerplätze.	

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	VDE 0603-2 DIN VDE 0603-2:1098-03	Installationskleinverteiler und Zählerplätze AC 400 V; Hauptleitungsabzweigklemmen.	
Electrical engineering	VDE 0609 -1 DIN EN 60999:2000-12 EN 60999:2000 IEC 60999 (1999-11) Ed. 2.0	Connecting devices – Electrical copper conductors – Safety requirements for screw-type and screwless-type clamping units – Part 1: General requirements and particular requirements for clamping units for conductors from 0,2 mm^2 up to 35 mm^2 (included).	
Electrical engineering	VDE 0623 -1 DIN EN 60309-1:2014-12 EN 60309-1:2005 IEC 60309-1 (2012-06) Ed. 4.2	Plugs, socket-outlets and couplers for industrial purposes – Part 1: General requirements.	
Electrical engineering	VDE 0604-202 DIN EN 61914:2010-01 IEC 61914 (2009-01) Ed. 1.0	Cable cleats for electrical installations.	
Electrical engineering	VDE 0623 -20 DIN EN 60309-2:2013-01 EN 60309-2:2012 IEC 60309-2 (2012-05) Ed. 4.2	Plugs, socket-outlets and couplers for industrial purposes – Part 2: Dimensional interchangeability requirements for pin and contact-tube accessories.	
Electrical engineering	VDE 0630 - 1 DIN EN 61058-1:2001-10 EN 61058-1:2008 IEC 61058-1 (2008-04) Ed. 3.2	Switches for appliances – Part 1: General requirements.	
Electrical engineering	VDE 0630 - 2-1 DIN EN 61058-2-1:2001-08 EN 61058-2-1:2011 IEC 61058-2-1 (2010-11) Ed. 2.0	Switches for appliances – Part 2-1: Particular requirements for cord switches.	
Electrical engineering	VDE 0640 DIN EN 62019:2006-01 EN 62019:2005 IEC 62019 (2003-01)	Electrical accessories – Circuit-breakers and similar equipment for household use – Auxiliary contact units.	

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	IEC 60898-1 (2015-03) Ed. 2.0 EN 60898-1 DIN EN 60898-1:2013 VDE 0641-1	Electrical accessories - Circuit-breakers for overcurrent protection for household and similar installations – Part 1: Circuit-breakers for a.c. operation	
Electrical engineering	IEC 60898-2 (2003-07) Ed. 1.1 EN 60898-2: 2007 DIN EN 60898-2:2007 VDE 0641-2	Circuit-breakers for overcurrent protection for household and similar installations – Part 2: Circuit-breakers for a.c. and d.c. operation	
Electrical engineering	IEC 60934 (2013-01) Ed. 3.2 DIN EN 60934:2013-11 VDE 0642	Circuit-breakers for equipment (CBE).	
Electrical engineering	IEC 61008-1 (2013-09) Ed. 3.2 DIN EN 61008-10:2015-11 VDE 0664-10	Residual current operated circuit-breakers without integral overcurrent protection for household and similar uses (RCCBs) – Part 1: General rules	
Electrical engineering	IEC 61008-2-1 (1990-12) Ed. 1.0 DIN EN 61008-2-11:1999-12 VDE 0664-2-11	Residual current operated circuit-breakers without integral overcurrent protection for household and similar uses (RCCB's). – Part 2-1: Applicability of the general rules to RCCB's functionally independent of line voltage	
Electrical engineering	IEC 61008-2-2 (1990-12) Ed. 1.0 DIN EN 61008-2-2 VDE 0664-2-2	Residual current operated circuit-breakers without integral overcurrent protection for household and similar uses (RCCB's). – Part 2-2: Applicability of the general rules to RCCB's functionally dependent on line voltage	
Electrical engineering	IEC 61009-1 (2013-09) Ed. 3.2 DIN EN 61009-20:2015-11 VDE 0664-20	Residual current operated circuit-breakers with integral overcurrent protection for household and similar uses (RCBOs) – Part 1: General rules	

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Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	IEC 61009-2-1 (1991-09) Ed. 1.0 DIN EN 61009-21:1999-12 VDE 0664-21	Residual current operated circuit-breakers with integral overcurrent protection for household and similar uses (RCBO's) – Part 2-1: Applicability of the general rules to RCBO's functionally independent of line voltage	
Electrical engineering	IEC 61009-2-2 (1991-09) Ed. 1.0 DIN EN 61009-2-2 VDE 0664-2-2	Residual current operated circuit-breakers with integral overcurrent protection for household and similar uses (RCBO's) – Part 2-2: Applicability of the general rules to RCBO's functionally dependent on line voltage	
Electrical engineering	IEC 60099-4 (2014-06) Ed. 3.0 DIN EN 60099-4:2015-07 VDE 0675-4	Surge arresters – Part 4: Metal-oxide surge arresters without gaps for a.c. systems	
Electrical engineering	IEC 60099-5 (2013-05) Ed. 2.0 DIN EN 60099-5:2014-09 VDE 0675-5	Surge arresters – Part 5: Selection and application recommendations	
Electrical engineering	IEC 60099-6 (2002-08) Ed. 1.0	Surge arresters – Part 6: Surge arresters containing both series and parallel gapped structures - Rated 52 kV and less	
Electrical engineering	IEC 60099-8 (2011-01) Ed. 1.0 DIN EN 60099-8:2011-11 VDE 0675-8	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	
Electrical engineering	IEC 60099-9 (2014-06) Ed. 1.0 DIN EN 60099-9:2015-08 VDE 0675-9	Surge arresters – Part 9: Metal-oxide surge arresters without gaps for HVDC converter stations	
Electrical engineering	IEC 61643-11 (2011-03) Ed. 1.0 DIN EN 61643-11/A1:2015/09 VDE 0675-6-11	Low-voltage surge protective devices – Part 11: Surge protective devices connected to low-voltage power systems - Requirements and test methods	

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	IEC 61643-12 (2008-11) Ed. 2.0 DIN EN 61643-12:2013-04 VDE 0675-6-12	Low-voltage surge protective devices – Part 12: Surge protective devices connected to low-voltage power distribution systems - Selection and application principles	
Electrical engineering	IEC 61643-21 (2012-07) Ed. 1.2	Low voltage surge protective devices – Part 21: Surge protective devices connected to telecommunications and signalling networks - Performance requirements and testing methods	
Electrical engineering	IEC 61643-22 (2015-06) Ed. 2.0	Low-voltage surge protective devices – Part 22: Surge protective devices connected to telecommunications and signalling net-works – Selection and application principles	
Electrical engineering	IEC 61643-311 (2013-04) Ed. 1.0	Components for low-voltage surge protective devices – Part 311: Performance requirements and test circuits for gas discharge tubes (GDT)	
Electrical engineering	IEC 61643-312 (2013-04) Ed. 1.0	Components for low-voltage surge protective devices – Part 312: Selection and application principles for gas discharge tubes	
Electrical engineering	IEC 61643-321 (2001-12) Ed. 1.0	Components for low-voltage surge protective devices – Part 321: Specifications for avalanche breakdown diode (ABD)	
Electrical engineering	IEC 61643-331 (2003-05) Ed. 1.0	Components for low-voltage surge protective devices – Part 331: Specification for metal oxide varistors (MOV)	
Electrical engineering	IEC 61643-341 (2001-11) Ed. 1.0	Components for low-voltage surge protective devices – Part 341: Specification for thyristor surge suppressors (TSS)	

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	VDE 0675-39-11 DIN EN 50539-11:2013-12 EN 50539-11:2013	Überspannungsschutzgeräte für Niederspannung - Überspannungsschutzgeräte für besondere Anwendungen einschließlich Gleichspannung – Teil 11: Anforderungen und Prüfungen für Überspannungsschutzgeräte für den Einsatz in Photovoltaik-Installationen.	
Low-voltage switchgear and controlgear assemblies			
Electrical engineering	IEC 61439-1 (2011-08) Ed. 2.0 DIN EN 61439-1:2014-06 VDE 0660-600-1	Low-voltage switchgear and controlgear assemblies – Part 1: General rules	
Electrical engineering	IEC 61439-2 (2011-08) Ed.2.0 DIN EN 61439-2:2012-06 VDE 0660-600-2	Low-voltage switchgear and controlgear assemblies – Part 2: Power switchgear and controlgear assemblies	
Electrical engineering	IEC 61439-3 (2012-02) Ed. 1.0 DIN EN 61439-3:2014-10 VDE 0660-600-3	Low-voltage switchgear and controlgear assemblies – Part 3: Distribution boards intended to be operated by ordinary persons (DBO)	
Electrical engineering	IEC 61439-4 (2012-11) Ed.1.0 DIN EN 61439-4:2013-09 VDE 0660-600-4	Low-voltage switchgear and controlgear assemblies – Part 4: Particular requirements for assemblies for construction sites (ACS)	
Electrical engineering	IEC 61439-5 (2015-03) Ed. 2.0 DIN EN 61439-5:2015-10 VDE 0660-600-5	Low-voltage switchgear and controlgear assemblies – Part 5: Assemblies for power distribution in public networks	
Electrical engineering	IEC 61439-6 (2012-05) Ed. 1.0 DIN EN 61439-6:2013-06 VDE 0660-600-6	Low-voltage switchgear and controlgear assemblies – Part 6: Busbar trunking systems (busways)	
Electrical engineering	IEC/TS 61439-7 (2014-02) Ed. 1.0 DIN EN 61439-7:2014-10 VDE 0660-600-7	Low-voltage switchgear and controlgear assemblies – Part 7: Assemblies for specific applications such as marinas, camping sites, market squares, electric vehicles charging stations	

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Switching, control and protective equipment			
Electrical engineering	VDE 0435 Teil 201 DIN EN 61810-1:2009-02 EN 61810-1:2008 IEC 61810-1 (2015-02) Ed. 4.0	Electromechanical elementary relays – Part 1: General and safety requirements.	
Electrical engineering	VDE 0435 - 300 DIN EN 60255-1:2010-09 EN 60255-1:2010 IEC 60255-1 (2009-08) Ed. 1.0	Measuring relays and protection equipment – Part 1: Common requirements.	
Electrical engineering	VDE 0435 - 2021 DIN EN 61812-1:2015-04 EN 61812-1:2011 IEC 61812-1 (2011-05) Ed. 2.0	Time relays for industrial and residential use – Part 1: Requirements and tests.	
Electrical engineering	VDE 0631-2-1 DIN EN 60730-2-1:2012-10 EN 60730-2-1:2010 IEC 60730-2-1 (2014-09) Ed. 5.0	Automatic electrical controls – Part 1: General requirements.	
Electrical engineering	VDE 0631 Teil 2-10 DIN EN 60730-2-10:2008-06 EN 60730-2-10:2007 IEC 60730-2-10 (2006-10)	Automatic electrical controls for household and similar use – Part 2-10: Particular requirements for motor-starting relays	
Instrument transformers			
Electrical engineering	VDE 0414-9-2 DIN EN 61869-2:2014-06 EN 61869-2:2012 IEC 61869-2 (2012-09) Ed. 2.0	Instrument transformers – Part 2: Additional requirements for current transformers.	
Electrical engineering	VDE 0414-9-3 DIN EN 61869-3:2012-05 EN 61869-3:2011 IEC 61869-3 (2011-07) Ed. 1.0	– Part 3: Additional requirements for inductive voltage transformers.	

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Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	VDE 414-9-4 HD 548.3 S1 DIN EN 61869-4:2015-04 EN 61869-4:2014 IEC 61869-4 (2013-11) Ed. 1.0	Instrument transformers – Part 4: Additional requirements for combined transformers.	
Low-voltage equipment			
Electrical engineering	VDE 0558-11 DIN EN 60146-1-1:2011-04 EN 60146-1-1:2010 IEC 60146-1-1 (2009-06) Ed. 4.0	Semiconductor converters – General requirements and line commutated converters – Part 1-1: Specification of basic requirements.	
Electrical engineering	VDE 0558 - 8 DIN EN 60146-1-3:1994-03 EN 60146-1-3:1993 IEC 60146-1-3 (1991-04) Ed. 3.0	Semiconductor convertors – General requirements and line commutated convertors – Part 1-3: Transformers and reactors.	
Electrical engineering	VDE 0638 DIN 57638:1981-09	Niederspannungs-Schaltgeräte - Schalter-Sicherungs-Einheiten D0-System.	

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Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Testing of high-voltage, medium-voltage and low-voltage cables and their accessories as described in the subsequent listed standards.			
Polyvinyl chloride insulated cables			
Electrical engineering	IEC 60227-1 (2007-10) Ed. 3.0	Polyvinyl chloride insulated cables of rated voltages up to and including 450 V / 750 V – Part 1: General requirements.	
Electrical engineering	IEC 60227-3 (1997-11) Ed. 2.1	Polyvinyl chloride insulated cables of rated voltages up to and including 450 V / 750 V – Part 3: Non-sheathed cables for fixed wiring.	
Electrical engineering	IEC 60227-4 (1997-12) Ed. 2.1	Polyvinyl chloride insulated cables of rated voltages up to and including 450 V / 750 V – Part 4: Sheathed cables for fixed wiring.	
Electrical engineering	IEC 60227-5 (2011-09) Ed. 3.0	Polyvinyl chloride insulated cables of rated voltages up to and including 450 V / 750 V – Part 5: Flexible cables (cords).	
Electrical engineering	IEC 60227-6 (2001-06) Ed. 3.0	Polyvinyl chloride insulated cables of rated voltages up to and including 450 V / 750 V – Part 6: Lift cables and cables for flexible connections.	
Electrical engineering	IEC 60227-7 (2012-01) Ed. 1.2	Polyvinyl chloride insulated cables of rated voltages up to and including 450 V / 750 V – Part 7: Flexible cables screened and unscreened with two or more conductors	
Electrical engineering	VDE 0281 - 8 DIN VDE 0281-8: 2000-09 HD 21.8 S2 + A1:1999	Polyvinylchlorid-isolierte Leitungen mit Nennspannungen bis 450 V / 750 V. Einadrige Leitungen ohne Mantel für Lichterketten.	
Electrical engineering	VDE 0281 - 9 DIN VDE 0281-9:2001-01 HD 21.9 S2 + A1:1999	Polyvinylchlorid-isolierte Leitungen mit Nennspannungen bis 450 V / 750 V. Einadrige Leitungen ohne Mantel zur Verlegung bei tiefen Temperaturen.	
Electrical engineering	VDE 0285-525-1 DIN EN 50525-1:2012-01 EN 50525-1:2011	Starkstromleitungen mit Nennspannungen bis 450 V / 750 V (U_0/U) –Teil 1: Allgemeine Anforderungen.	

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Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	VDE 0285-525-2-11 DIN EN 50525-2-11:2012-01 EN 50525-2-11:2011	– Flexible Leitungen mit thermoplastischer PVC-Isolierung.	
Electrical engineering	VDE 0285-525-2-12 DIN EN 50525-2-12:2012-01 EN 50525-2-12:2011	– Wendelleitungen mit thermoplastischer PVC-Isolierung.	
Electrical engineering	VDE 0285-525-2-21 DIN EN 50525-2-21:2012-01 EN 50525-2-21:2011	– Flexible Leitungen mit vernetzter Elastomer-Isolierung.	
Electrical engineering	VDE 0285-525-2-31 DIN EN 50525-2-31:2012-01 EN 50525-2-31:2011	– Ader und Verdrahtungsleitung mit thermoplastischer PVC-Isolierung.	
Electrical engineering	VDE 0285-525-2-41 DIN EN 50525-2-41:2012-01 EN 50525-2-41:2011	– Einadrige Leitung mit vernetzter Silicon-Isolierung.	
Electrical engineering	VDE 0285-525-2-42 DIN EN 50525-2-42:2012-01 EN 50525-2-42:2011	– Ader- und Verdrahtungsleitungen mit vernetzter EVA-Isolierung.	
Electrical engineering	VDE 0285-525-2-51 DIN EN 50525-2-51:2012-01 EN 50525-2-51:2011	– Ölbeständige Steuerleitung mit thermoplastischer PVC-Isolierung.	
Electrical engineering	VDE 0285-525-2-71 DIN EN 50525-2-71:2012-01 EN 50525-2-71:2011	– Lahnlitzen-Leitung mit thermoplastischer PVC-Isolierung.	
Electrical engineering	VDE 0285-525-2-72 DIN EN 50525-2-72:2012-01 EN 50525-2-72:2011	– Trennbare Zwillingsleitungen mit thermoplastischer PVC-Isolierung.	
Electrical engineering	VDE 0285-525-2-81 DIN EN 50525-2-81:2012-01 EN 50525-2-81:2011	– Lichtbogenschweißleitungen mit vernetzter Elstomer- Hülle.	
Electrical engineering	VDE 0285-525-2-82 DIN EN 50525-2-82:2012-01 EN 50525-2-82:2011	– Leitungen für Lichterketten mit vernetzter Elastomer-Isolierung.	

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	VDE 0285-525-2-83 DIN EN 50525-2-83:2012-01 EN 50525-2-83:2011	– Mehradrige Leitungen mit vernetzter Silicon-Isolierung.	
Electrical engineering	VDE 0285-525-3-11 DIN EN 50525-3-11:2012-01 EN 50525-3-11:2011	– Teil 3-11: Starkstromleitungen mit verbessertem Verhalten im Brandfall – Flexible halogenfreie, raucharme Leitungen mit thermoplastischer Isolierung.	
Electrical engineering	VDE 0285-525-3-21 DIN EN 50525-3-21:2012-01 EN 50525-3-21:2011	– Teil 3-21: Starkstromleitungen mit verbessertem Verhalten im Brandfall – Flexible halogenfreie, raucharme Leitungen mit vernetzter Isolierung.	
Electrical engineering	VDE 0285-525-3-31 DIN EN 50525-3-31:2012-01 EN 50525-3-31:2011	– Teil 3-31: Starkstromleitungen mit verbessertem Verhalten im Brandfall – Halogenfreie, raucharme Ader- und Verdraht-ungsleitungen mit thermoplastischer Isolierung.	
Electrical engineering	VDE 0285-525-3-41 DIN EN 50525-3-41:2012-01 EN 50525-3-41:2011	– Teil 4-31: Starkstromleitungen mit verbessertem Verhalten im Brandfall – Halogenfreie, raucharme Ader- und Verdrahtungsleitungen mit vernetzter Isolierung.	
Electrical engineering	VDE 0262 DIN VDE 0262:2004-01	Installationskabel mit Isolierungen aus vernetzten Polyethylen und Mantel aus thermoplastischem PVC mit Nennspannung 0,6 / 1 kV.	
Electrical engineering	DIN VDE 0276-603:2010-03 VDE 0276-603 HD 603:2007	Starkstromkabel – Teil 603: Energiekabel mit Nennspannung 0,6 / 1 kV.	
Electrical engineering	DIN VDE 0276-604:2008-02 VDE 0276-604 HD 604:2005	Starkstromkabel – Teil 603: Energiekabel mit Nennspannung 0,6 / 1 kV mit verbessertem Verhalten im Brandfall für Kraftwerke.	

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Test methodes			
Electrical engineering	IEC 60332-1-1 (2004-07) Ed. 1.0 IEC 60332-1-2 (2004-07) Ed. 1.0 IEC 60332-1-3 (2004-07) Ed. 1.0 DIN EN 60332 -1-1:2005-06 DIN EN 60332 -1-2:2005-06 DIN EN 60332 -1-3:2005-06 VDE 0482-332 -1-1 VDE 0482-332 -1-2 VDE 0482-332 -1-3	Tests on electric and optical fiber cables under fire conditions – 1-1 Test for vertical flame propagation for a single insulated wire or cable – Apparatus – 1-2 Procedure for 1 kW pre-mixed flame – 1-3 Procedure for determination of flaming droplets/particles. Prüfungen an Kabeln, isolierten Leitungen und Glasfaserkabeln im Brandfall.	
Electrical engineering	VDE 0432 - 1:2011-10	Hochspannungs-Prüftechnik Allgemeine Festlegungen zu Prüfbedingungen.	
Electrical engineering	VDE 0432 - 2:2011-10	Hochspannungs-Prüftechnik Messsysteme.	
Electrical engineering	VDE 0472 - 401 DIN 57472-401:1984-06	Prüfung an Kabel und isolierten Leitungen Außenmaße.	
Electrical engineering	VDE 0472 - 402 DIN 57472-402:1984-06	Prüfung an Kabel und isolierten Leitungen. Wanddicke sowie Dicke von Bewehrungsdrähten und –bändern.	
Electrical engineering	VDE 0472 -1 DIN VDE 0472 -1:1987-06	Prüfung an Kabel und isolierten Leitungen ; Allgemeines.	
Electrical engineering	VDE 0472 – 505:1983-04 DIN 57472-505	Prüfung an Kabel und isolierten Leitungen. Verlustfaktor, dielektrische Verlustzahl und Ableitung.	
Electrical engineering	VDE 0472 - 509 DIN VDE 0472-509:1986-10	Prüfung an Kabel und isolierten Leitungen. Spannungsfestigkeit bei Kabeln und Leitungen, isolierten Schaltdrähten und Schnüren für Fernmeldeanlagen.	
Electrical engineering	VDE 0472 - 512 DIN VDE 0472-512:1985-05	Prüfung an Kabel und isolierten Leitungen. Widerstand zwischen Schutzleiter und Leitschicht.	
Electrical engineering	VDE 0472 – 604:1985-05 DIN VDE 0472-604	Prüfung an Kabel und isolierten Leitungen Dichtheit von Kabelmänteln.	

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	VDE 0472 - 605 DIN VDE 0472-605:1985-01	Prüfung an Kabel und isolierten Leitungen Abrieb.	
Electrical engineering	DE 0472 - 613 DIN VDE 0472-613:1986-03	Prüfung an Kabel und isolierten Leitungen Weiterreißwiderstand.	
Electrical engineering	VDE 0472 - 626 DIN 57472-626:1983-01	Prüfung an Kabel und isolierten Leitungen Reißlänge.	
Electrical engineering	DIN EN 50497:2008-11 VDE 0473-497 EN 50497:2007	Empfohlenes Prüfverfahren zur Einschätzung des Risikos von Weichmacher-ausschwitzungen bei PVC-isolierten und –ummantelten Kabeln und Leitungen.	
Electrical engineering	VDE 0473-811-100 DIN EN 60811 – 100:2012-12 EN 60811 – 100:2008 IEC 60811 – 100 (2008-03) Ed. 1.0	Electric and optical fibre cables – Test methods for non-metallic materials – Part 100: General.	
Electrical engineering	VDE 0473-811-201 DIN EN 60811 – 201:2012-12 EN 60811 - 201 IEC 60811 – 201 (2012-03) Ed. 1.0	Electric and optical fibre cables – Test methods for non-metallic materials – Part 201: General tests – Measurement of insulation thickness.	
Electrical engineering	VDE 0473-811-202 DIN EN 60811 – 202:2012-12 EN 60811 - 202 IEC 60811 – 202 (2012-03) Ed. 1.0	Electric and optical fibre cables – Test methods for non-metallic materials – Part 202: General tests – Measurement of thickness of non-metallic sheath.	
Electrical engineering	VDE 0473-811-203 DIN EN 60811 – 203:2012-12 EN 60811 - 203 IEC 60811 – 203 (2012-03) Ed. 1.0	Messung der Außenmaße.	
Electrical engineering	VDE 0473-811-301 DIN EN 60811 - 301:2012-12 EN 60811 - 301 IEC 60811 – 301 (2012-03) Ed. 1.0	Electric and optical fibre cables – Test methods for non-metallic materials – Part 301: Electrical tests – Measurement of the permittivity at 23 °C of filling compounds	

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	VDE 0473-811-302 DIN EN 60811 - 302:2012-12 EN 60811 - 302 IEC 60811 – 302 (2012-03) Ed. 1.0	Electric and optical fibre cables – Test methods for non-metallic materials – Part 302: Electrical tests – Measurement of the d.c. resistivity at 23 °C and 100 °C of filling.	
Electrical engineering	VDE 0473-811-401 DIN EN 60811 - 401:2012-12 EN 60811 - 401 IEC 60811 – 401 (2012-03) Ed. 1.0	Electric and optical fibre cables – Test methods for non-metallic materials – Part 401: Miscellaneous tests – Thermal ageing methods – Ageing in an air oven.	
Electrical engineering	VDE 0473-811-402 DIN EN 60811 - 402:2012-12 EN 60811 - 402 IEC 60811 – 402 (2012-03) Ed. 1.0	Electric and optical fibre cables – Test methods for non-metallic materials – Part 402: Miscellaneous tests – Water absorption tests.	
Electrical engineering	VDE 0473-811-404 DIN EN 60811 - 404:2012-12 EN 60811 - 404 IEC 60811 – 404 (2012-03) Ed. 1.0	Electric and optical fibre cables – Test methods for non-metallic materials – Part 404: Miscellaneous tests – Mineral oil immersion tests for sheaths.	
Electrical engineering	VDE 0473-811-405 DIN EN 60811 - 405:2012-12 EN 60811 - 405 IEC 60811 – 405 (2012-03) Ed. 1.0	Electric and optical fibre cables – Test methods for non-metallic materials – Part 405: Miscellaneous tests – Thermal stability test for PVC insulations and PVC sheaths.	
Electrical engineering	VDE 0473-811-406 DIN EN 60811 - 406:2012-12 EN 60811 - 406 IEC 60811 – 406 (2012-03) Ed. 1.0	Electric and optical fibre cables – Test methods for non-metallic materials – Part 406: Miscellaneous tests – Resistance to stress cracking of polyethylene and polypropylene compounds.	
Electrical engineering	VDE 0473-811-407 DIN EN 60811 - 407:2012-12 EN 60811 - 407 IEC 60811 – 407 (2012-03) Ed. 1.0	Electric and optical fibre cables – Test methods for non-metallic materials – Part 407: Miscellaneous tests – Measurement of mass increase of polyethylene and polypropylene compounds.	

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	VDE 0473-811-408 DIN EN 60811 - 408:2012-12 EN 60811 - 408 IEC 60811 – 408 (2012-03) Ed. 1.0	Electric and optical fibre cables – Test methods for non-metallic materials – Part 408: Miscellaneous tests – Long-term stability test of polyethylene and polypropylene compounds.	
Electrical engineering	VDE 0473-811-409 DIN EN 60811 - 409:2012-12 EN 60811 - 409 IEC 60811 – 409 (2012-03) Ed. 1.0	Electric and optical fibre cables – Test methods for non-metallic materials – Part 409: Miscellaneous tests – Loss of mass test for thermoplastic insulations and sheaths.	
Electrical engineering	VDE 0473-811-501 DIN EN 60811 - 501:2012-12 EN 60811 - 501 IEC 60811 – 501 (2012-03) Ed. 1.0	Electric and optical fibre cables – Test methods for non-metallic materials – Part 501: Mechanical tests – Tests for determining the mechanical properties of insulating and sheathing compounds.	
Electrical engineering	VDE 0473-811-502 DIN EN 60811 - 502:2012-12 EN 60811 - 502 IEC 60811 – 502 (2012-03) Ed. 1.0	Electric and optical fibre cables – Test methods for non-metallic materials – Part 502: Mechanical tests – Shrinkage test for insulations.	
Electrical engineering	VDE 0473-811-503 DIN EN 60811 - 503:2012-12 EN 60811 - 503 IEC 60811 – 503 (2012-03) Ed. 1.0	Electric and optical fibre cables – Test methods for non-metallic materials – Part 503: Mechanical tests – Shrinkage test for sheaths.	
Electrical engineering	VDE 0473-811-504 DIN EN 60811 - 504:2012-12 EN 60811 - 504 IEC 60811 – 504 (2012-03) Ed. 1.0	Electric and optical fibre cables – Test methods for non-metallic materials – Part 504: Mechanical tests – Bending tests at low temperature for insulation and sheaths.	
Electrical engineering	VDE 0473-811-505 DIN EN 60811 - 505:2012-12 EN 60811 - 505 IEC 60811 – 505 (2012-03) Ed. 1.0	Electric and optical fibre cables – Test methods for non-metallic materials – Part 505: Mechanical tests – Elongation at low temperature for insulations and sheaths.	

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Electrical engineering	VDE 0473-811-506 DIN EN 60811 - 506:2012-12 EN 60811 - 506 IEC 60811 – 506 (2012-03) Ed. 1.0	Schlagprüfung bei niedrigen Temperaturen für Isolierhüllen und Mäntel. Electric and optical fibre cables – Test methods for non-metallic materials – Part 506: Mechanical tests – Impact test at low temperature for insulations and sheaths.	
Electrical engineering	VDE 0473-811-507 DIN EN 60811 - 507:2012-12 EN 60811 - 507 IEC 60811 – 507 (2012-03) Ed. 1.0	Electric and optical fibre cables – Test methods for non-metallic materials – Part 507: Mechanical tests – Hot set test for cross-linked materials.	
Electrical engineering	VDE 0473-811-508 DIN EN 60811 - 508:2012-12 EN 60811 - 508 IEC 60811 – 508 (2012-03) Ed. 1.0	Electric and optical fibre cables – Test methods for non-metallic materials – Part 508: Mechanical tests – Pressure test at high temperature for insulation and sheaths.	
Electrical engineering	VDE 0473-811-509 DIN EN 60811 - 509:2012-12 EN 60811 - 509 IEC 60811 – 509 (2012-03) Ed. 1.0	Electric and optical fibre cables – Test methods for non-metallic materials – Part 509: Mechanical tests – Test for resistance of insulations and sheaths to cracking (heat shock test).	
Electrical engineering	VDE 0473-811-512 DIN EN 60811 - 512:2012-12 EN 60811 - 512 IEC 60811 – 512 (2012-03) Ed. 1.0	Electric and optical fibre cables – Test methods for non-metallic materials – Part 512: Mechanical tests – Methods specific to polyethylene and polypropylene compounds – Tensile strength and elongation at break after conditioning at elevated temperature.	
Electrical engineering	VDE 0473-811-513 DIN EN 60811 - 513:2012-12 EN 60811 - 513 IEC 60811 – 513 (2012-03) Ed. 1.0	Electric and optical fibre cables – Test methods for non-metallic materials – Part 513: Mechanical tests – Methods specific to polyethylene and polypropylene compounds – Wrapping test after conditioning.	

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Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	VDE 0473-811-605 DIN EN 60811 - 605:2012-12 EN 60811 - 605 IEC 60811 – 605 (2012-03) Ed. 1.0	Electric and optical fibre cables – Test methods for non-metallic materials – Part 605: Physical tests – Measurement of carbon black and/or mineral filler in polyethylene compounds.	
Electrical engineering	VDE 0473-811-606 DIN EN 60811 - 606:2012-12 EN 60811 - 606 IEC 60811 – 606 (2012-03) Ed. 1.0	Electric and optical fibre cables – Test methods for non-metallic materials – Part 606: Physical tests – Methods for determining the density.	
Accessories for power cables with rated voltages up to 30 kV			
Electrical engineering	DIN EN 61442:2006-01 VDE 0278-442 EN 61442:2005 IEC 61442 (2005-03) Ed. 2.0	Test methods for accessories for power cables with rated voltages from 6 kV (Um = 7,2 kV) up to 30 kV (Um = 36 kV).	
Electrical engineering	VDE 0278 - 629-1 DIN VDE 0278-629-1:2009-07 HD 629.1:2008	Prüfanforderungen für Kabelgarnituren für extrudierte Kunststoffkabel mit einer Nennspannung von 3,6 / 6 (7,2) kV bis 20,8 / 36 (42) kV, – Teil 1: Kabel mit extrudierter Kunststoffisolierung.	
Electrical engineering	VDE 0278 - 629-2 DIN VDE 0278-629-2:2009-07 HD 629.2:2008	Prüfanforderungen für Kabelgarnituren für extrudierte Kunststoffkabel mit einer Nennspannung von 3,6 / 6 (7,2) kV bis 20,8 / 36 (42) kV, – Teil 2: Kabel mit massegetränkter Papierisolierung.	
Electrical engineering	VDE 0279 DIN 57279:1982-10	Leitungs-Garnituren des Bergbaus unter Tage Muffen (U_0/U) = 0,6 / 1 kV.	
Electrical engineering	DIN EN 61238-1:2004-03 VDE 0220-100 IEC 61238-1 (2003-05) Ed. 2.0	Compression and mechanical connectors for power cables for rated voltages up to 30 kV (Um = 36 kV) – Part 1: Test methods and requirements.	
Electrical engineering	DIN V 47640	Verbindungsmuffen aus wärmeschrumpfendem Kunststoffschlauch für Kunststoffisolierte Starkstromkabel mit Nennspannung 0,6 / 1 (1,2) kV.	

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Power cables and Accessories for power cables with rated voltages up to 400 kV (Um ≤ 420 kV)			
Electrical engineering	DIN VDE 0276–632:1999-05 HD 632 S1:1996	Kabel mit Isolierung aus vernetztem Polyethylen und ihre Garnituren für Nennspannung von 30 bis 150 kV.	
Electrical engineering	DIN VDE 0276–633:1999-05 HD 633 S1:1997	Niederdruck Ölkabel und ihre Garnituren für Nennspannungen bis 220 kV.	
Electrical engineering	DIN VDE 0276 – 634:1999-05 HD 634 S1:1997	Gasinnendruckkabel und ihre Garnituren für Nennspannungen bis 220 kV.	
Electrical engineering	DIN VDE 0276 – 635:1999-05 HD 635 S1:1997	Gasaußendruckkabel und ihre Garnituren für Nennspannungen bis 220 kV.	
Electrical engineering	VDE 0265 DIN VDE 0265:1995-12	Kabel mit Kunststoffisolierung und Bleimantel für Starkstromanlagen.	
Electrical engineering	VDE 0266 DIN VDE 0266:2006-03	Starkstromkabel mit verbessertem Verhalten im Brandfall.	
Electrical engineering	VDE 0271 DIN VDE 0271:2008-02	Kabel; Starkstromkabel mit Isolierung und Mantel aus thermoplastischem PVC und Nennspannungen bis Uo/U (Um): 3,6 / 6 (7,2) kV.	
Electrical engineering	VDE 0276 - 605 DIN VDE 0276-605:2008-02	Starkstromkabel Ergänzende Prüfverfahren.	
Electrical engineering	VDE 0276 - 620 DIN VDE 0276-620:2010-11	Energieverteilungskabel mit extrudierter Isolierung für Nennspannungen Uo/U: 3,6 / 6 kV bis 20,8 / 36 kV.	
Electrical engineering	VDE 0276 - 621 DIN VDE 0276-621:1997-05	Energieverteilungskabel mit getränkter Papierisolierung für Mittelspannung.	
Electrical engineering	VDE 0276 - 622 DIN VDE 0276-622:2006-05	Starkstromkabel mit Nennspannungen von3,6 / 6 (7,2) kV bis 20,8 / 36 (42) kV mit verbessertem Verhalten im Brandfall für Kraftwerke.	
Electrical engineering	VDE 0276 - 626 DIN VDE 0276-626:1997-01	Isolierte Freileitungsseile für oberirdische Verteilungsnetze mit Nennspannung Uo/U (Um): 0,6 / 1 (1,2) kV.	
Electrical engineering	VDE 0276 - 627 DIN VDE 0276-627:2006-09	Vieladrige und vielpaarige Kabel für die Verlegung in Luft und in Erde.	

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	VDE 0279 DIN 50279:1982-10	Leitungsgarnituren des Bergbaus unter Tage, Muffen 1 kV.	
Electrical engineering	VDE 0278-393 DIN EN 50393:2006-11 EN 50393:2006	Prüfverfahren und Prüfanforderungen für die Garnituren von Verteilerkabeln mit Nennspannung von 0,6 / 1,0 (1,2) kV.	
Electrical engineering	IEC 60141-1 (1998-08) Ed. 3.0	Tests on oil-filled and gas-pressure cables and their accessories – Part 1: Oil-filled, paper-insulated, metal-sheathed cables and accessories for alternating voltages up to and including 400 kV.	
Electrical engineering	IEC 60141-2 (1967-01) Ed. 1.0	Tests on oil-filled and gas-pressure cables and their accessories. – Part 2: Internal gas-pressure cables and accessories for alternating voltages up to 275 kV.	
Electrical engineering	IEC 60141-3 (1967-01) Ed. 1.0	Tests on oil-filled and gas-pressure cables and their accessories. – Part 3: External gas-pressure (gas compression) cables and accessories for alternating voltages up to 275 kV.	
Electrical engineering	IEC 60141-4 (1990-10) Ed. 1.0	Tests on oil-filled and gas-pressure cables and their accessories. – Part 4: Oil-impregnated paper-insulated high pressure oil-filled pipe-type cables and accessories for alternating voltages up to and including 400 kV.	
Electrical engineering	IEC 60840 (2011-11) Ed. 4.0	Tests for power cables with extruded insulation for rated voltages above 30 kV (Um = 36 kV) up to 150 kV (Um = 170 kV).	
Electrical engineering	IEC 60055-1 (2005-05) Ed. 5.1	Paper-insulated metal-sheathed cables for rated voltages up to 18 / 30 kV (with copper or aluminum conductors and excluding gas-pressure and oil-filled cables) – Part 1: Tests on cables and their accessories.	

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	IEC 60055-2 (2005-02) Ed. 1.0	Paper-insulated metal-sheathed cables for rated voltages up to 18 / 30 kV (with copper or aluminium conductors and excludeing gaspressure and oil-filled cables). – Part 2: General and construction requirements.	
Electrical engineering	EC 60502-1 (2009-09) Ed. 2.0	Power cables with extruded insulation and their accessories for rated voltages from 1 kV (Um = 1,2 kV) up to 30 kV (Um = 36 kV) – Part 1: Cables for rated voltages of 1 kV (Um = 1,2 kV) and 3 kV (Um = 3,6 kV).	
Electrical engineering	IEC 60502-2 (2014-02) Ed. 2.0	Power cables with extruded insulation and their accessories for rated voltages from 1 kV (Um = 1,2 kV) up to 30 kV (Um = 36 kV) – Part 2: Cables for rated voltages from 6 kV (Um = 7,2 kV) up to 30 kV (Um = 36 kV.	
Electrical engineering	IEC 60502-4 (2010-12) Ed. 3.0	Power cables with extruded insulation and their accessories for rated voltages from 1 kV (Um = 1,2 kV) up to 30 kV (Um = 36 kV) – Part 4: Test requirements on accessories for cables with rated voltages from 6 kV (Um = 7,2 kV) up to 30 kV (Um = 36 kV).	
Electrical engineering	VDE 0276-2067 DIN IEC 62067:2013-08 IEC 62067 (2011-11) Ed. 2.0	Starkstromkabel mit extrudierter Isolierung und ihre Garnituren für Nennspannungen über 150 kV (Um = 170 kV) bis einschließlich 500 kV (Um = 550 kV) – Prüfverfahren und Anforderungen. Power cables with extruded insulation and their accessories for rated voltage above 150 kV (Um = 170 kV) up to 500 kV (Um = 550 kV) – Test methods and requirements.	
Electrical engineering	IEC 60227-2 (2003-04) Ed. 2.1	Electrical test methods for electric cables. – Part 1: Electrical tests for cables, cords and wires for voltages up to and including 450 V / 750 V.	
Electrical engineering	VDE 0481 - 885-2 DIN EN 60885-2 IEC 60885-2 (1987-03) Ed. 1.0	Prüfung an Kabeln und isolierten Leitungen; Teilentladung. Electrical test methods for electric cables. – Part 2: Partial discharge tests.	

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	VDE 0481 - 885-3 DIN EN 60885-3 IEC 60885-3 (2015-04) Ed. 2.0	Prüfung an Kabeln und isolierten Leitungen; Teilentladung an extrudierten Kabellängen. Electrical test methods for electric cables. – Part 3: Test methods for partial discharge measurements on lengths of extruded power cables.	
Electrical engineering	VDE 0473-229 DIN EN 60229:2009-04 EN 60229:2008 IEC 60229 (2007-10) Ed. 3.0	Tests on cable oversheaths which have a special protective function and are applied by extrusion.	
Electrical engineering	VDE 0481-395 DIN EN 50395:2006-07 EN 50395:2005	Elektrische Prüfung für Niederspannungskabel und -leitungen.	
Electrical engineering	VDE 0473-396 DIN EN 50396:2006-07 EN 50396:2005	Nicht-elektrische Prüfverfahren für Niederspannungskabel und -leitungen.	
Electrical engineering	VDE 0481 - 230 DIN EN 60230:2003-03 EN 60230:2002 IEC 60230 (1966-01) Ed. 1.0	Impulse tests on cables and their accessories.	
Electrical engineering	IEEE 48:2009	IEEE Standard for Test Procedures and Requirements for Alternating-Current Cable Terminations Used on Shielded Cables Having Laminated Insulation Rated 2.5 kV through 765 kV or Extruded Insulation Rated 2.5 kV through 500 kV.	
Electrical engineering	IEEE 404:2012	IEEE Standard for Extruded and Laminated Dielectric Shielded Cable Joints Rated 2500 V to 500.000 V.	
Electrical engineering	IEEE 386:2006	IEEE Standard for Separable Insulated Connector Systems for Power Distribution Systems Above 600 V.	

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	IEEE 592:2007	IEEE Standard for Exposed Semiconducting Shields on High-Voltage Cable Joints and Separable Connectors.	

ВЯРНО С
ОРИГИНАЛА

Technical responsibility for the test reports:

Approval:

Herr Dipl.-Wirt.-Ing. Rainer Schiller
Herr Dipl.-Ing. Hannes Zinnbauer
Herr Dipl.-Ing. Detlef Jegust

Technical verification:

Herr Dipl.-Ing. Winfried Moritz
Herr Dipl.-Ing. Klaus Vaterrodt
Herr Dipl.-Ing. Jürgen Wittwer
Herr Dipl.-Ing. Detlef Jegust
Herr Dipl.-Ing. Uwe Fischer
Herr Dipl.-Ing. Michael Scheide
Herr Dipl.-Ing. Matthias Schröder-Heske
Herr Dipl.-Ing. Carlos Pereira
Herr Dipl.-Ing. Martin Brüggemann
Herr Ronny Baumgart

ВЯРНО С
ОРИГИНАЛА

Приложение 2.5

ДЕКЛАРАЦИЯ

че предложеното оборудване в процедурата отговаря на минималните технически изисквания на Възложителя

Аз, долуподписаният Стоил Колев Стоилов, в качеството ми на представляващ „Старт-Инженеринг“ АД, участник в открита процедура за възлагане на обществена поръчка с реф. № PPD18-103 и предмет: “Модернизация (ретрофит) на възлови разпределителни станции 20 (10) kV и изграждане на вериги на телемеханика“,

ДЕКЛАРИРАМ ЧЕ:

1. Предложеното от нас оборудване в процедурата за позиция „Токов измервателен трансформатор 24 kV, 400/5/5А за монтиране на закрито“ отговаря на минималните технически изисквания на Възложителя, посочени в таблица 2.
2. Доставяните от нас материали, апаратура, оборудване и съоръжения отговарят на посочените от възложителя в документацията за участие стандарти за изпълнение на поръчката.
3. Предложените от нас материали, апаратура, оборудване и съоръжения са с технически характеристики и показатели, които съответстват на техническите характеристики и показатели, посочени от възложителя за изпълнение на поръчката в документацията за участие.

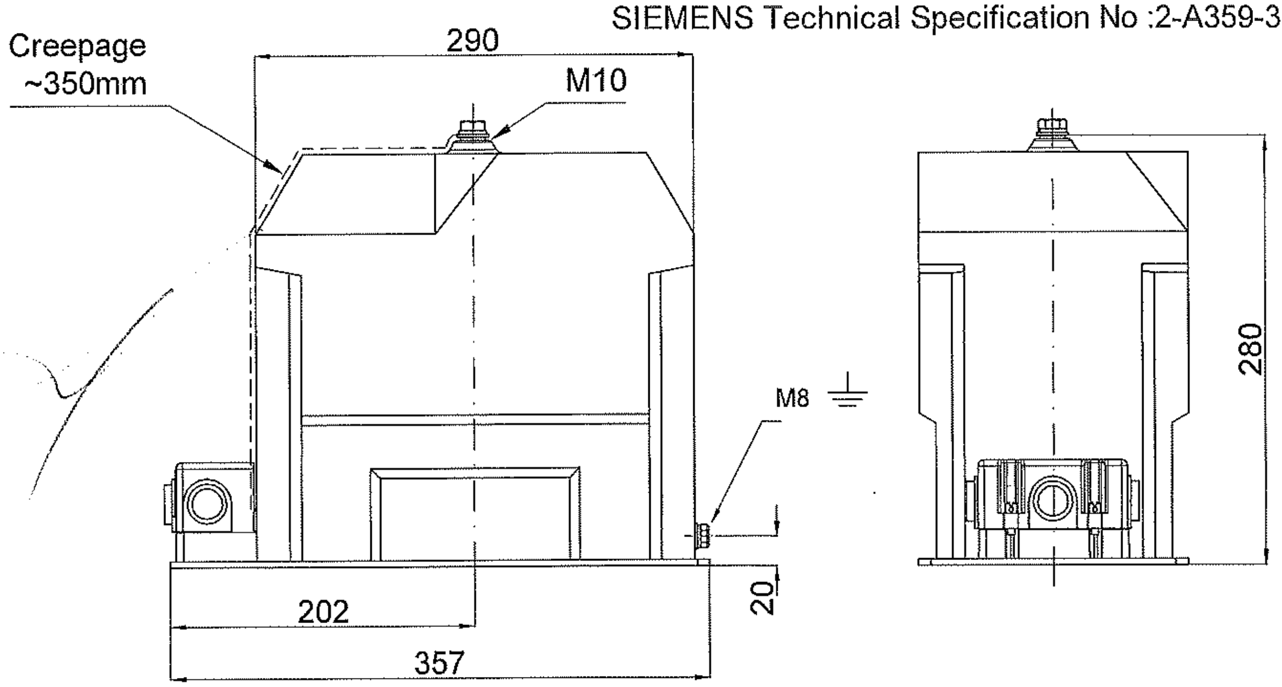
Информиран съм, че Възложителят (включително чрез неговия помощен орган, а именно назначената за провеждане на поръчката оценителна комисия) ще обработва и съхранява личните ми данни, посочени в настоящата декларация, за целите на провеждане на обществената поръчка, като за целта ще предприеме всички необходими според действащата нормативна уредба мерки за защита на личните ми данни.

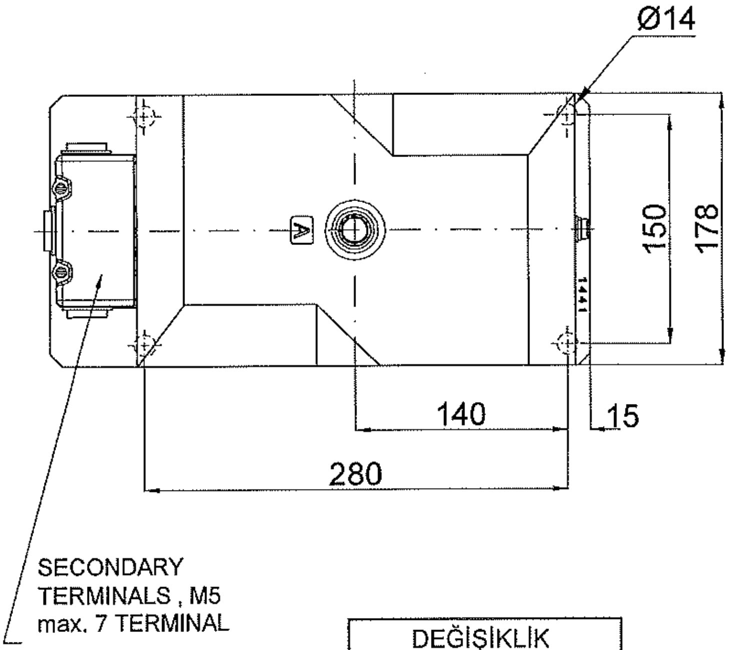
Дата 17.12.2018 г.

ПОДПИС и ПЕЧАТ: На основание чл.36а ал.3 от ЗОП

Председател на Съвета на директорите на „Старт-Инженеринг“ АД

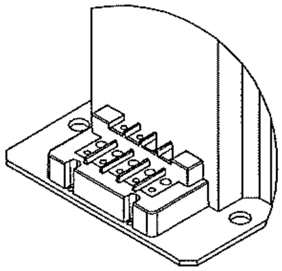
SIEMENS Technical Specification No :2-A359-305





SCREW	TORQUE Nm
M5	4
M8	16-20
M10	30-40

DEĞİŞİKLİK
TEKNİK BÜRO
Tarih 20 / 02 / 2014

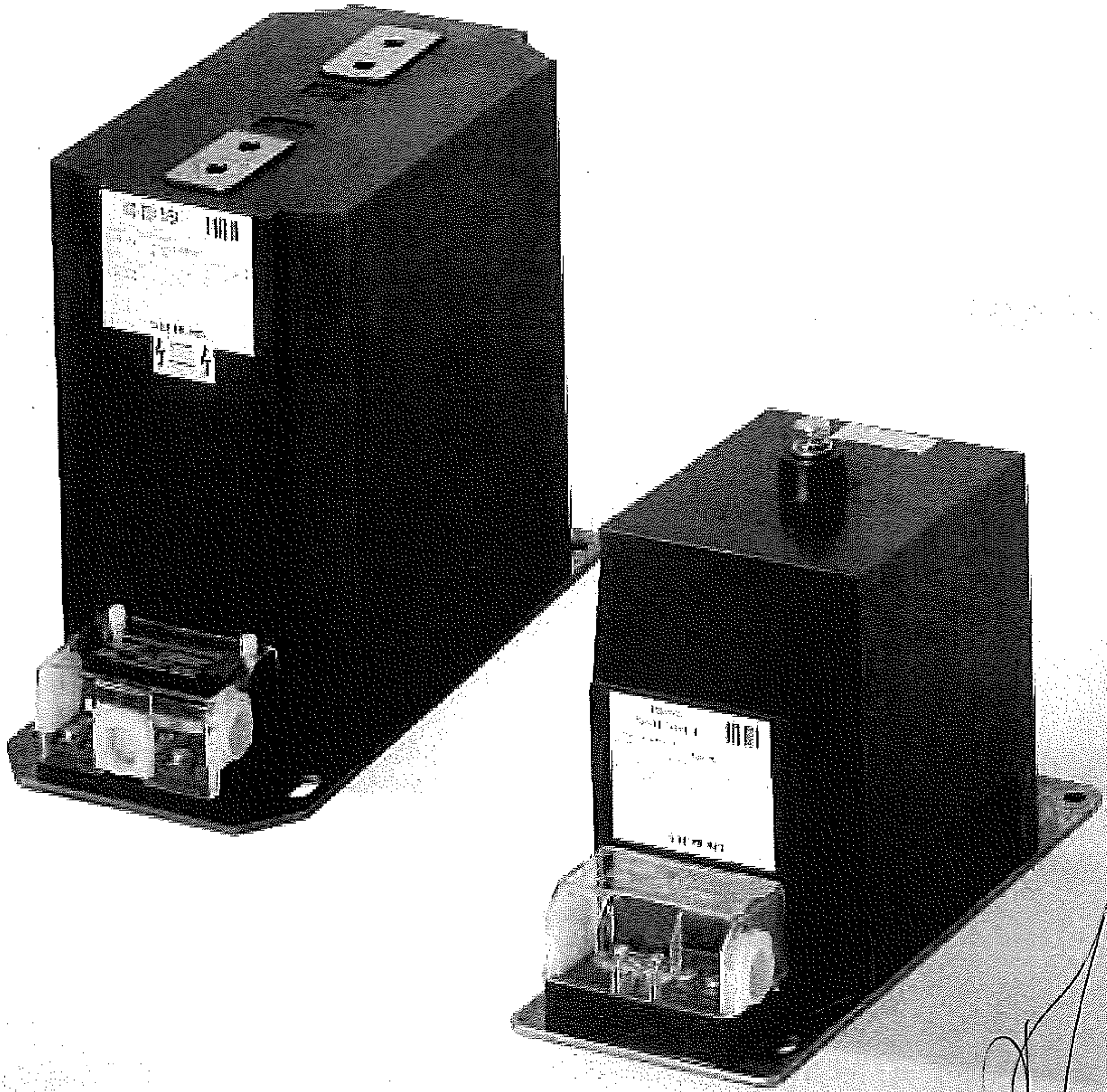


SECONDARY TERMINAL'S DETAIL

QTY	DESCRIPTION	POS	DIMENSIONS	WEIGHT	PART OR DIN NO.	MATERIAL

NO	DATE	NAME	MODIFICATION
G	09-11-10	AYSE	Procedure no changed
H	20-02-14	AYŞE	Secondary terminals changed.

TOLERANCES DIN ISO 2768-g	4MR14 VOLTAGE TRANSFORMER SIEMENS	14-12-04	PLATE CODE 3001441
SCALE 1/1			BOX CODE 3003005
		419	REV. H
	REPLACES THE DRAWING NO.		DR'N
	ALCE TRANSFORMING SUPPORTING	OG Ölçü Trafo	CH'D
			APP'D
			C.C MT



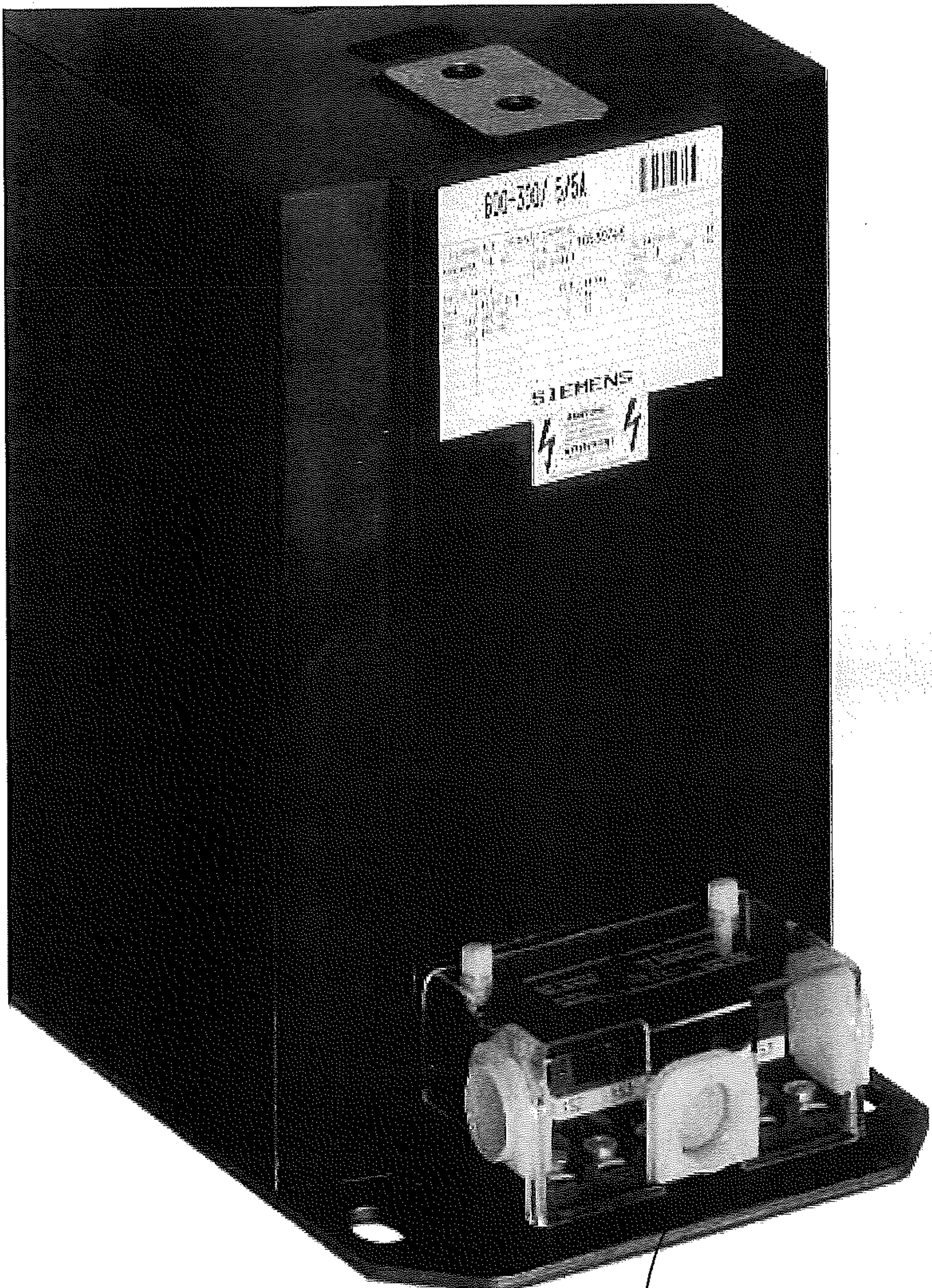
4M Protective and Measuring Transformers

Medium-Voltage Equipment
Selection and Ordering Data

Catalog HG 24 · 2009

Answers for energy.

SIEMENS



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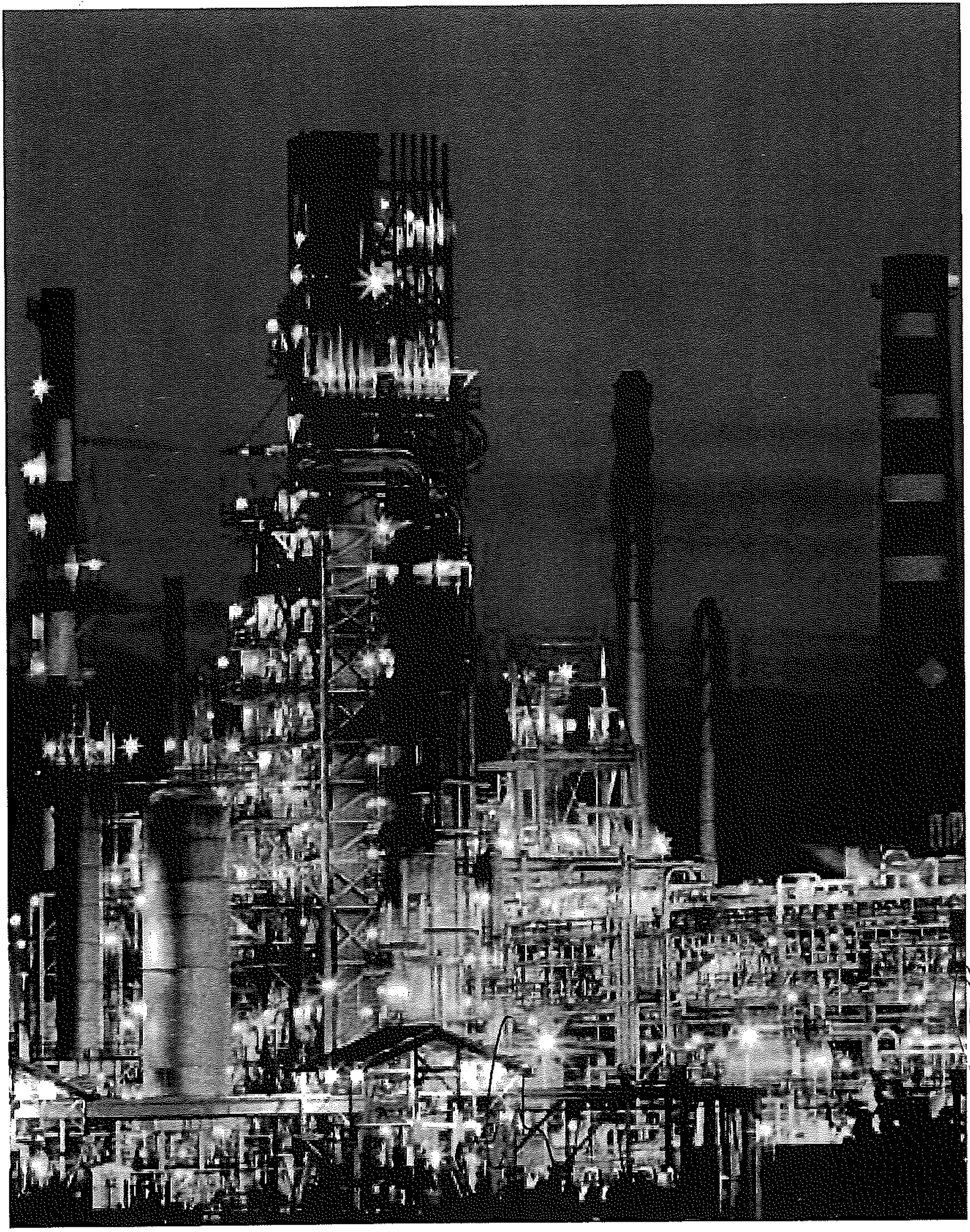
4M Protective and Measuring Transformers

Medium-Voltage Equipment
Catalog HG 24 · 2009

Invalid: Catalog HG 24 · 1994



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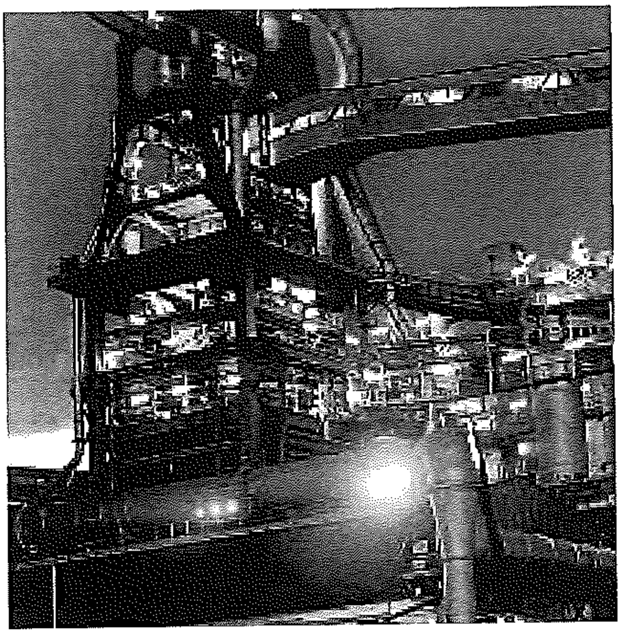
373


R-HG11-174.tif

Industrial application: Refinery

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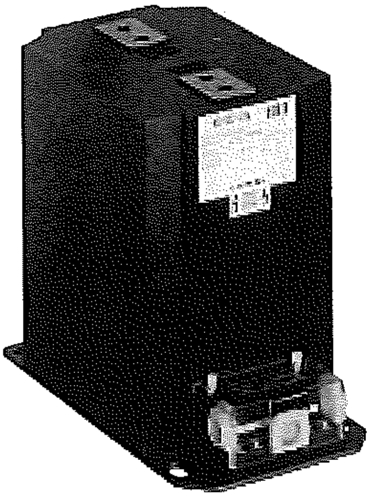
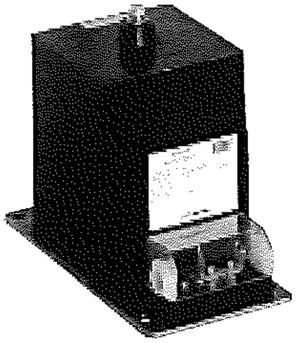
Protective and Measuring Transformers – The Adaptable

The task of instrument transformers is to transform high currents and voltages proportionally and in-phase into small current or voltage values for measuring or protection purposes. So they are used either to measure and record the transmitted power or to feed protection devices with evaluable signals, which enable the protection device to e.g. trip a switching device depending on the situation. Furthermore, they isolate the connected measuring or protection equipment electrically from live parts of the switchgear.

Current transformer



Voltage transformer



Current transformers can be regarded as transformers working in short-circuit, with the full normal current flowing through their primary side. Devices connected on the secondary side are series-connected. Current transformers can have several secondary windings with magnetically separated cores of the same or different characteristics. They can, for example, be equipped with two measuring cores of different accuracy class, or with measuring and protection cores with different accuracy limit factors.

Due to the risk of overvoltages, current transformers must not be operated with open secondary terminals, but only in short circuit or with the burden of the measuring equipment.

Voltage transformers contain only one magnet core and are normally designed with one single secondary winding. If necessary, earthed (single-phase) voltage transformers are provided with an additional residual voltage winding (earth-fault winding) beside the secondary winding (measuring winding).

In contrast to current transformers, voltage transformers must never be short-circuited on the secondary side. The earth-side terminal of the primary winding is effectively earthed in the terminal box, and must not be removed in operation.

Types of construction

Protective and measuring transformers are designed in different types of construction for the multiple installation requirements and operating conditions they are subjected to. They are electrical devices which convert primary electrical values – currents or voltages – into proportional and in-phase values that are adequate for the connected devices such as measuring instruments, meters, protection relays and similar. A distinction is made here between current and voltage transformers.

The following transformer types are available for selection in this catalog:

Current transformers

- Indoor support-type current transformer in block-type design
- Indoor support-type current transformer in single-turn design (e.g. bar-primary transformer)
- Indoor bushing-type current transformer in single-turn design
- Indoor bar-primary bushing-type current transformer
- Outdoor support-type current transformer

Voltage transformers

- Earthed (single-phase) or unearthed (double-phase) indoor transformers in different sizes
- Earthed (single-phase) or unearthed (double-phase) outdoor transformers in different sizes

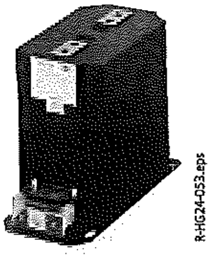
The transformers offered in the selection are only a part of the possible variations. If the transformer required is not shown, please clarify the feasibility with the responsible sales partner or the order processing department in the Switchgear Factory Berlin. The same applies to transformers according to the ANSI standard.

Approvals/Certifications

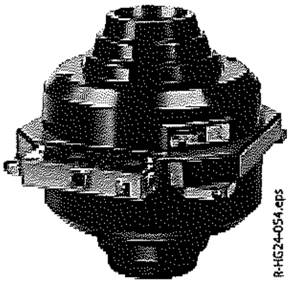
In Germany, instrument transformers may only be used for commercial purposes, such as billing metering of electricity, if they have been approved once (type approval) by the Physikalisch-Technische Bundesanstalt (PTB) (Federal Physical-Technical Institute), and if every transformer is calibrated by an officially recognised inspecting authority.

Calibration is done by a calibration office, or by the transformer manufacturer on behalf of a calibration office. The test is documented by means of a test mark as well as a calibration certificate.

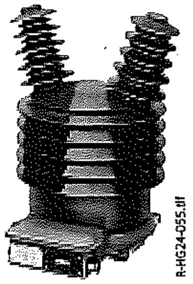
The calibration costs are charged in accordance with the official scale of fees.



Example for transformer in block-type design



Example for bushing-type transformer



Example for outdoor transformer

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Current transformers

Current transformers can be regarded as transformers operating in short circuit, which carry the full rated current on the primary side. The devices on the secondary side are series-connected. They can have several secondary windings with mechanically separated cores of the same or different characteristics. Thus, current transformers can be designed e.g. with two measuring cores of different accuracy class, or with measuring or protection cores with different accuracy limit factors.

Due to the risk of overvoltages, current transformers must not be operated with open secondary terminals, but only in short circuit or with the burden of the measuring equipment.

Glossary of terms

Rated current I_N (r.m.s. value in A)

The rated primary (I_{PN}) and secondary (I_{SN}) current is the current that characterises the transformer, or the current it is designed for. Both values are given on the transformer rating plate. The rated primary current (I_{PN}) depends on the power system and is defined by the system operator.

Usual values for primary currents (in A):

10; 12.5; 15; 20; 25; 30; 40; 50; 60; 75

and their decimal multiples (preferred values are underlined).

Usual values for secondary currents: 1 and 5 A.

For technical reasons, but above all for economical reasons, 1 A is recommended as secondary current, especially if there are long measuring leads.

Rated continuous thermal current I_D (thermal strength)

The value of the current which can be permitted to flow continuously in the primary winding, the secondary winding being connected to the rated burden, without the temperature rise exceeding the values specified.

I_D is often equal to I_N, but it can also be defined as a multiple thereof.

Rated short-time thermal current I_{th}

The r.m.s. value of the primary current, flowing in case of short circuit, which a current transformer will withstand for 1 or 3 seconds without suffering harmful effects, the secondary winding being short-circuited.

Rated dynamic current I_{dyn}

The peak value of the primary current which a transformer will withstand, without being damaged electrically or mechanically by the resulting electromagnetic forces, the secondary winding being short-circuited.

Rated transformation ratio K_N

The ratio of the rated primary current to the rated secondary current. It is expressed as an unreduced fraction, e.g. 500 A/1 A.

Rated output S_N

The value of the apparent power (in VA at a specified power factor), for which the current transformer has to keep the accuracy class at the rated secondary current and with rated burden. Thus, the rated output describes the capacity of a current transformer to "drive" the secondary current within the error limits by means of a burden.

Current transformers can feature the following preferred rated outputs: 2.5 VA; 5 VA; 10 VA; 15 VA; 30 VA.

Rated burden Z_N

The burden is the apparent resistance of the devices connected on the secondary side (including all connection leads), for which the current transformer has to keep the stipulated class limits. The burden is normally expressed as apparent power in VA.

Current error F_i

The current error of a current transformer is (in %):

$$F_i = 100 \cdot \frac{K_N \cdot I_{sec} - I_{prim}}{I_{prim}}$$

K_N	Rated transformation ratio
I_{prim}	Actual primary current
I_{sec}	Actual secondary current

Phase displacement d_i

The difference in phase between the primary and secondary current vectors, the direction of the vectors being so chosen that the angle is zero for a perfect transformer.

The phase displacement is said to be positive when the secondary current vector leads the primary current vector. It is usually expressed in minutes.

Limits of current error and phase displacement according to IEC 60044-1

Accuracy class	± current error in percent at rated current I_n				± phase displacement in minutes at rated current I_n			
	120 %	100 %	20 %	5 %	120 %	100 %	20 %	5 %
Measuring current transformers								
0.2	0.2	0.2	0.35	0.75	10	10	15	30
0.5	0.5	0.5	0.75	1.5	30	30	45	80
1	1	1	1.5	3	60	60	90	100
Protective current transformers								
5P	–	1	–	–	–	60	–	–
10P	–	3	–	–	–	–	–	–

Measuring current transformers

Current transformers provided for the connection of measuring instruments, meters and similar devices (e.g. 10 VA Cl. 0.5 FS5).

Rated instrument limit primary current

The value of the primary current at rated burden and a composite error of 10 %.

Instrument security factor n

The ratio of rated instrument limit primary current to the rated primary current

Note:

In the event of short-circuit currents flowing through the primary winding of a current transformer, the thermal stress to the measuring instruments supplied by the current transformer is smallest when the value of the rated instrument security factor is small.

Accuracy class

The limit of the percentage current error at rated current I_N (see table).

Generally, current transformers are used for a measuring range of 5 % to 120 % of the rated primary current.

Special designs

Extended current ratings

Current transformers with ext. 200 % can be continuously operated at 2 x I_N, and keep the error limits of their class in the range up to 200 % of the rated primary current.

Protective current transformers

Current transformers intended to supply protection relays (e.g. 15 VA Cl. 10 P 10).

Accuracy class (identification P)

The limit of the percentage current error for the rated accuracy limit primary current.

Rated accuracy limit primary current

The value of primary current up to which the transformer will comply with the requirements for composite error.

Accuracy limit factor

The ratio of the rated accuracy limit primary current to the rated primary current.

Multi-ratio current transformers

If the ratio of current transformers has to be variable, e.g. for planned switchgear extensions, it is possible to use multi-ratio current transformers.

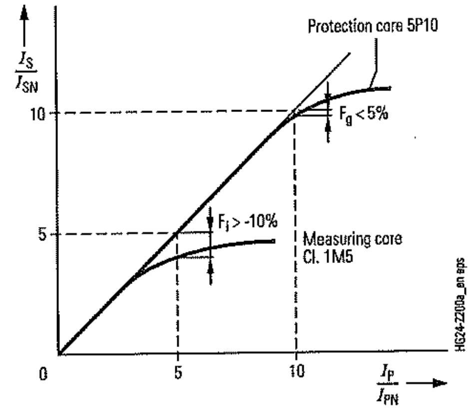
Primary multi-ratio

Only possible for wound-primary transformers (transformers with several primary turns) with a ratio of 1:2 (e.g. 2 x 600 A/1 A). Reconnection is made by re-arrangement of copper lugs in the primary connection area. Ratings, instrument security factors as well as the secondary internal resistance remain constant during reconnection.

Secondary multi-ratio

In single-turn and wound-primary transformers, this can be implemented by taps of the secondary windings (e.g. 2000–1000 A/1 A).

Ratings or instrument security factors change almost linearly with the ratio. If not stated otherwise, the specified rated data is always referred to the lower current value.



Overcurrent performance of current transformers when loaded with rated burden

F_i	Current error
F_g	Composite error

Performance in the event of overcurrent

In the event of an overcurrent, the rated secondary current increases proportionally with the rated primary current up to the rated instrument limit primary current.

The ratio of the rated instrument limit primary current to the rated primary current provides the instrument security factor assigned to the core. In accordance with this factor, the rated instrument limit primary current is subjected to specific error limits.

The measuring and protection cores place different demands on these error limits.

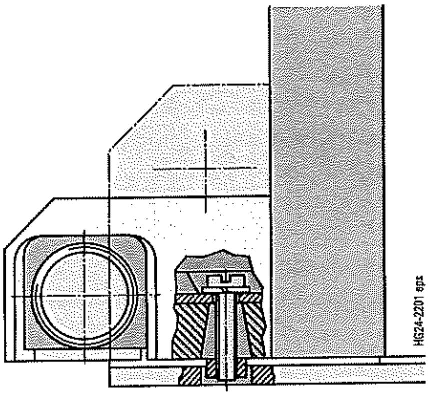
For measuring cores, the current error F_i is $> -10\ \%$ in order to protect the supplied measuring devices, meters, etc. safely in case of overcurrent.

In protection cores, the composite error F_g is max. 5 % (5P) or 10 % (10P) in order to ensure the desired protection tripping.

The specified limits are only fulfilled at the rated burden of the transformer. If the operating burden differs from the rated burden of the transformer, the instrument security factor changes as follows:

$$n' = n \cdot \frac{Z_N + S_E}{S + S_E}$$

n'	Actual instrument security factor
n	Rated instrument security factor
Z_N	Rated burden in VA
S_E	Internal power consumption of the transformer in VA (approx. 5 % to 20 % of Z_N)
S	Actually connected burden in VA



Earthing of the secondary winding, for example, in a 4MA7 current transformer

Operation and earthing

The secondary circuits of current transformers must never be open during operation, as dangerously high voltages can occur, especially at high currents and cores with high ratings.

All metal parts of a transformer that are not live, but accessible, must be earthed. Therefore, the transformers have earth connection points identified with the earthing symbol. Also, one terminal of the secondary winding (for current transformers, normally k or 1s, etc.) must be earthed.

For earthing the secondary windings, a thread is provided under each secondary terminal. The earth connection required is made by fitting a special screw.

Capacitively coupled voltage detecting system

The guidelines for every medium-voltage switchgear of the new generation state that doors and covers can only be opened when there is no risk of electric shock. The movable single-pole voltage testers used up to now are not suitable for this. Therefore, every medium-voltage switchgear is offered with a system including a fixed-mounted capacitive voltage divider.

The capacitive voltage detecting system consists of a capacitive divider which divides the voltage U between the phase L and earth into the partial voltages U_1 and U_2, and of an indicator applied to U_2. The indicator contains a glow lamp that flashes when voltage is applied.

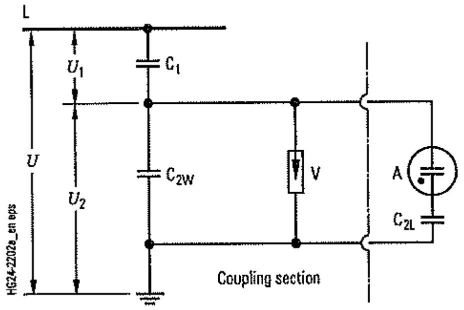
Indication range:
At 0.01 x U_N, no indication,
as of 0.40 x U_N, secure indication.

On request, support-type current transformers type 4MA7 can be delivered with capacitive layers for the voltage detecting system – then they contain a coupling electrode. This electrode is cast in a firm and protected way, and lead out at the secondary terminals with the designation CK. These current transformers are routine-tested additionally for compliance with the requested capacitance values (C_1 and C_{2W}). These values are documented on an additional label.

To ensure protection against electric shock even in the most improbable case that the current transformer punctures with the high-voltage capacitor (while an operator is touching the test sockets), a surge arrester is connected in parallel to this arrangement inside the transformer. If the high voltage is exceeded, it responds within nanoseconds, limiting the voltage at the test socket to harmless values.

Important for the ordering selection

When ordering transformers with capacitive layers it is necessary to state the actual operating voltage U_N (rated voltage), e.g. $U_m = 24$ kV, $U_N = 15$ kV.



Voltage detecting system

A	Indicator
C_1	High-voltage capacitance (transformer)
C_{2W}	Low-voltage capacitance (transformer)
C_{2L}	Low-voltage capacitance (lead)
L	High-voltage phase
U	Voltage between phase and earth
U_1	Partial voltage at C_1
U_2	Partial voltage at C_2 and A
V	Surge arrester

Voltage transformers

Voltage transformers have only one magnet core, and are normally designed with one single secondary winding. If necessary, earthed (single-phase) voltage transformers are equipped with an additional residual voltage winding (earth-fault winding) beside the secondary winding (measuring winding).

In contrast to current transformers, voltage transformers must never be short-circuited on the secondary side. The earth-side terminal of the primary winding is effectively earthed in the terminal box, and must not be removed during operation.

Glossary of terms

Highest voltage for equipment U_m

The highest r.m.s. phase-to-phase voltage (in kV) for which a transformer is designed in respect of its insulation.

Rated voltage U_N

The voltage values (primary U_{PN} or secondary U_{SN}) stated on the rating plate of a transformer. If the voltage transformers are connected between phase and earth in three-phase systems, this phase-to-neutral voltage is considered the rated voltage. Except for the residual voltage winding, it is expressed as $U/\sqrt{3}$, with U being the phase-to-phase voltage.

U_m kV	Rated primary voltage kV	Rated secondary voltage V
up to 52	3.3 3.6 4.8 5 6 6.6 7.2 10 11 13.8 15 17.5 20 22 30 33 35 40 45 or the values divided by $\sqrt{3}$	100 110 120 or the values divided by $\sqrt{3}$

Rated transformation ratio K_N

The ratio of the rated primary voltage to the rated secondary voltage. It is expressed as unreduced fraction, e.g.

$10000/\sqrt{3}$ V / $100/\sqrt{3}$ V (single-phase)
10000 V/100 V (double-phase).

Voltage error F_U

The voltage error expressed in percent is defined by the formula:

$$F_U = 100 \cdot \frac{K_N \cdot U_{sec} - U_{prim}}{U_{prim}}$$

U_{prim} Actual primary voltage
U_{sec} Actual secondary voltage under measuring conditions when U_{prim} is applied

Phase displacement

The difference in phase between the primary voltage and the secondary voltage vectors, the direction of the vectors being so chosen that the angle is zero for a perfect transformer. The phase displacement is said to be positive when the secondary voltage vector leads the primary voltage vector. It is usually expressed in minutes.

Limits for voltage error and phase displacement according to IEC 60044-1

The voltage error and phase displacement at rated frequency shall not exceed the values given in the table at any voltage between 80 % and 120 % of rated voltage and with burdens of between 25 % and 100 % of rated burden at a power factor of 0.8 lagging.

Accuracy class	± voltage error %	± phase displacement Minutes
0.2	0.2	10
0.5	0.5	20
1	1	40

Rated output S_N

The value of the apparent power (in VA at a specified power factor) which the transformer is intended to supply to the secondary circuit at the rated secondary voltage and with rated burden connected to it.

Preferred values:

Accuracy class	Rated output VA						
0.2	10	15	30	50	–	–	–
0.5	10	15	30	50	75	100	–
1	–	–	30	50	75	100	200

Thermal limiting output S_{th}

The value of the apparent power referred to rated voltage which can be taken from a secondary winding, at rated primary voltage applied, without exceeding the limits of temperature rise.

Thermal limiting output of the residual voltage winding

As the residual voltage winding is connected in broken delta, it is only stressed in case of fault. Therefore, the thermal limiting output of the residual voltage winding is referred to a stress duration of e.g. 8 h, and is expressed in VA.

Rated voltage factor

The multiplying factor to be applied to the rated primary voltage to determine the maximum voltage at which a transformer must comply with the relevant thermal requirements for a specified time and with the relevant accuracy requirements.

Multi-ratio

Voltage transformers for different rated primary voltages can only be reconnected on the secondary side for reasons of insulation.

Operation and earthing

In contrast to current transformers, voltage transformers must never be short-circuited on the secondary side. The earth-side primary terminal of earthed voltage transformers is insulated for a test voltage of 2 kV. It is connected to the earthed base plate in the terminal box.

Attention

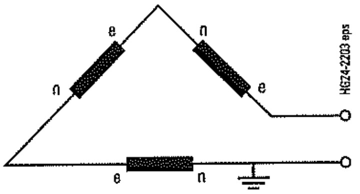
This connection must not be opened during operation.

Residual voltage windings connected in broken delta may only be earthed together at one point.

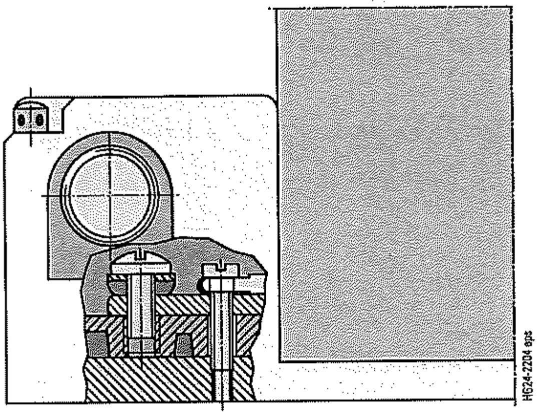
For earthing the secondary windings, a thread is provided under each secondary terminal. The earth connection required is established by fitting a special screw.

Relaxation oscillations

When single-phase voltage transformers are used in isolated systems, damping of the e–n windings connected in broken delta is recommended in order to avoid the possible destruction of the voltage transformers by relaxation oscillations.



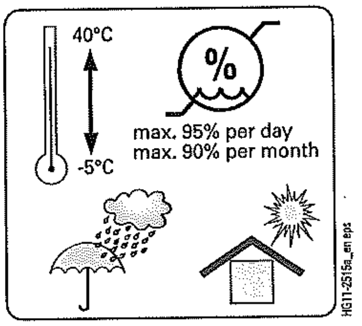
Connection and earthing of the e–n or da–dn winding

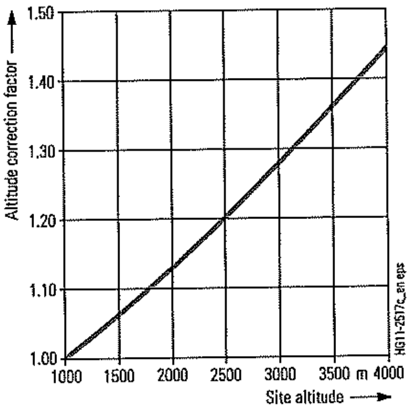


Earthing of the secondary winding, for example, in a 4MR voltage transformer

Description

Ambient conditions and dielectric strength





Highest voltage for equipment U_m kV	Rated short-duration power-frequency withstand voltage kV	Rated lightning impulse withstand voltage V
7.2	20	60
12	28	75
17.5	38	95
24	50	125
36	70	170
52	95	250

Ambient conditions

The transformers are designed for the normal operating conditions defined in the standards.

The conditions shown opposite apply to indoor transformers. All indoor transformers are suitable for use with high air humidity and occasional condensation (e.g. in tropical areas).

As for outdoor transformers, the following conditions apply:

Minimum temperature

Outdoor transformers class 25	–25 °C
Outdoor transformers class 40	–40 °C

Relative air humidity

Outdoor transformers	up to 100 %

Dielectric strength

The dielectric strength of air insulation decreases with increasing altitude due to low air density. According to IEC 62271-1, the values of the rated lightning impulse withstand voltage and the rated short-duration power-frequency withstand voltage specified, among others, in the chapter "Technical Data" apply to a site altitude of 1000 m above sea level. For an altitude above 1000 m, the insulation level must be corrected according to the opposite diagram.

The characteristic shown applies to both rated withstand voltages.

To select the devices, the following applies:

$U \geq U_0 \times K_a$

U Rated withstand voltage under reference atmosphere
U_0 Rated withstand voltage requested for the place of installation
K_a Altitude correction factor according to the opposite diagram

Example

For a requested rated lightning impulse withstand voltage of 75 kV at an altitude of 2500 m, an insulation level of 90 kV under reference atmosphere is required as a minimum:

90 kV ≥ 75 kV x 1.2

Test voltages and insulation level for instrument transformers

Proper operation of the transformers is proved by the following tests:

- Impulse test (type test)
- Separate source withstand voltage test (routine test)
- Induced voltage withstand test (routine test)
- Partial discharge measurement (routine test)

All transformers correspond to insulation class E, i.e. the maximum temperature rise is 120 °C.

Partial discharge measurement

Apart from the tests mentioned on page 14, partial discharge measurements are required for current and voltage transformers to test the insulation. A partial discharge is to be understood as any small, brief electrical discharge appearing on or in a test object when voltage is applied. The discharges appear as soon as the partial discharge inception voltage of the insulating medium is exceeded at any point.

Relatively high field strengths appear at sharp edges and peaks of metal parts, or also on bubbles and gas inclusions in solid or liquid insulating materials.

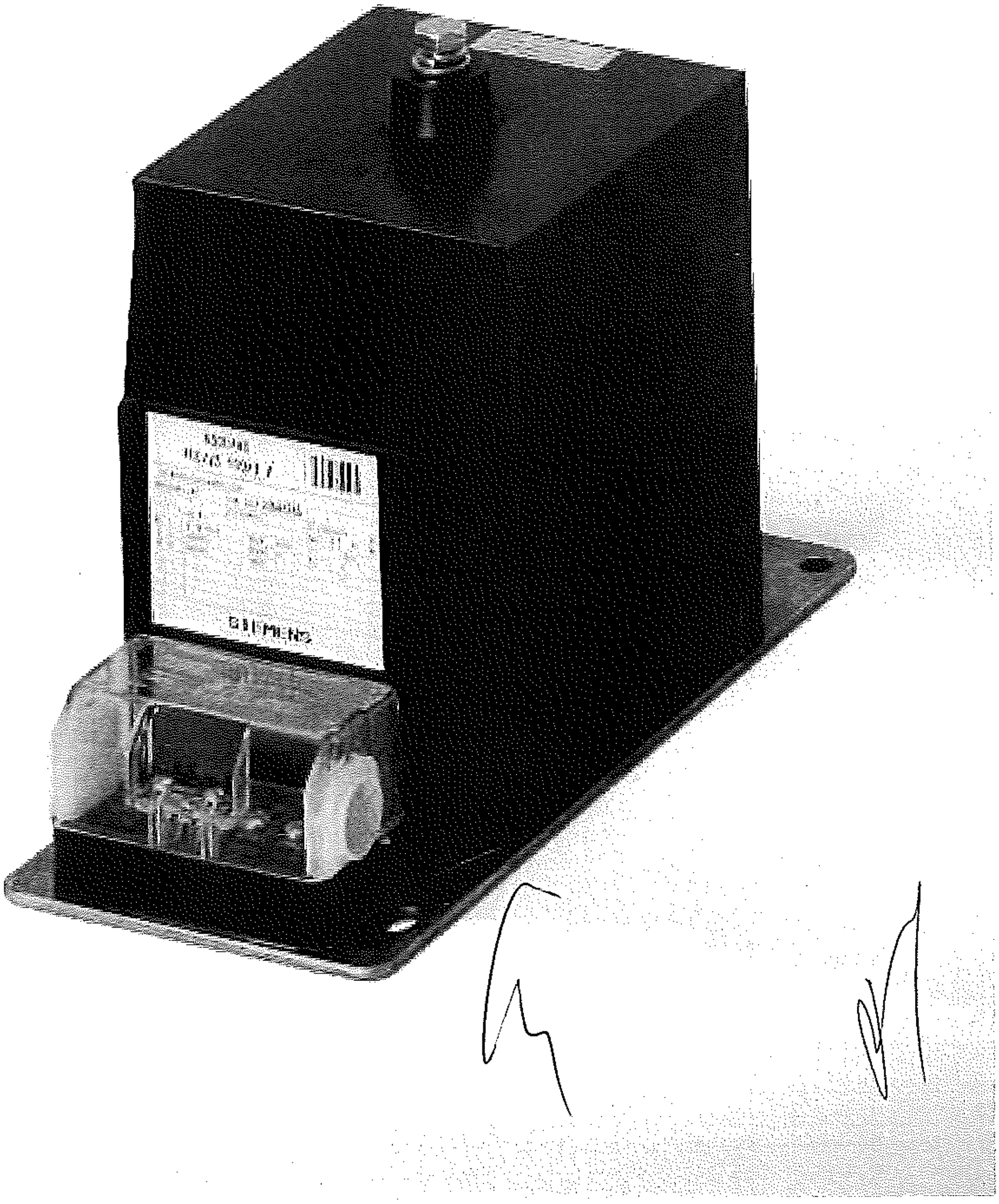
Partial discharges act like HF emitters, producing a mixture of the most different frequencies. The partial discharge measurement enables an assessment about the homogeneity of the insulating material. Partial discharge measurements are performed as a routine test on inductive transformers with solid insulation as of $U_m = 3.6$ kV.

Type of earthing	Type of transformer	Pre-stressing voltage	Measuring voltage	Permissible partial discharge level
		≥ 10 s	≥ 1 min	Apparent load
Systems with isolated or impedance earthed neutral	Current transformers and earthed voltage transformers	$1.3\ U_m$	$1.1\ U_m$ $1.1\frac{U_m}{\sqrt{3}}$	250 pC 50 pC
	Unearthed voltage transformers	$1.3\ U_m$	$1.1\ U_m$	50 pC
Systems with solidly earthed neutral	Current transformers and earthed voltage transformers	$0.8 \times 1.3\ U_m$	$1.1\frac{U_m}{\sqrt{3}}$	50 pC
	Unearthed voltage transformers	$1.3\ U_m$	$1.1\ U_m$	50 pC

Standards

Protective and measuring transformers conform to the following standards:

- VDE 0414 "Stipulations for instrument transformers"
- VDE 0111 "Insulation co-ordination for equipment in three-phase systems above 1 kV"
- IEC 60044-1
- IEC 60044-2
- ANSI 1675 (IEEE)
- DIN 42600



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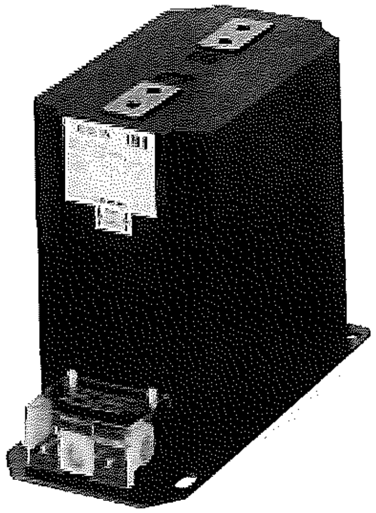
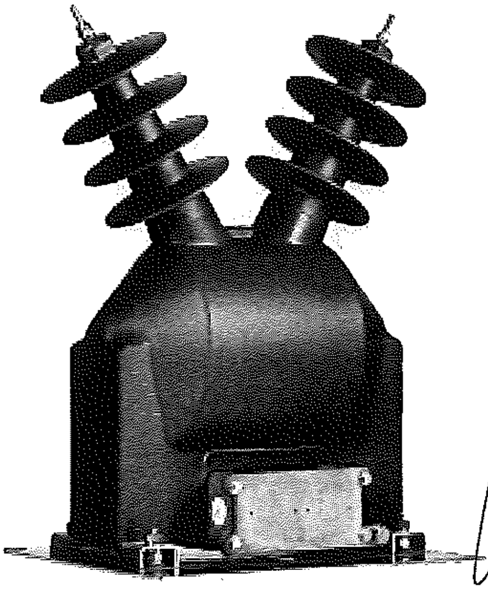


4MA74 current transformer



4MS6 outdoor voltage transformer

Contents Page

Equipment Selection 17

Equipment Selection

Ordering data and configuration example

Order number structure

Protective and measuring transformers are described by a 12 or 16-digit order number. The first five characters describe the type, design and application of the transformer (primary part), and the positions 6 to 12 or 6 to 16 identify the core data of the transformer.

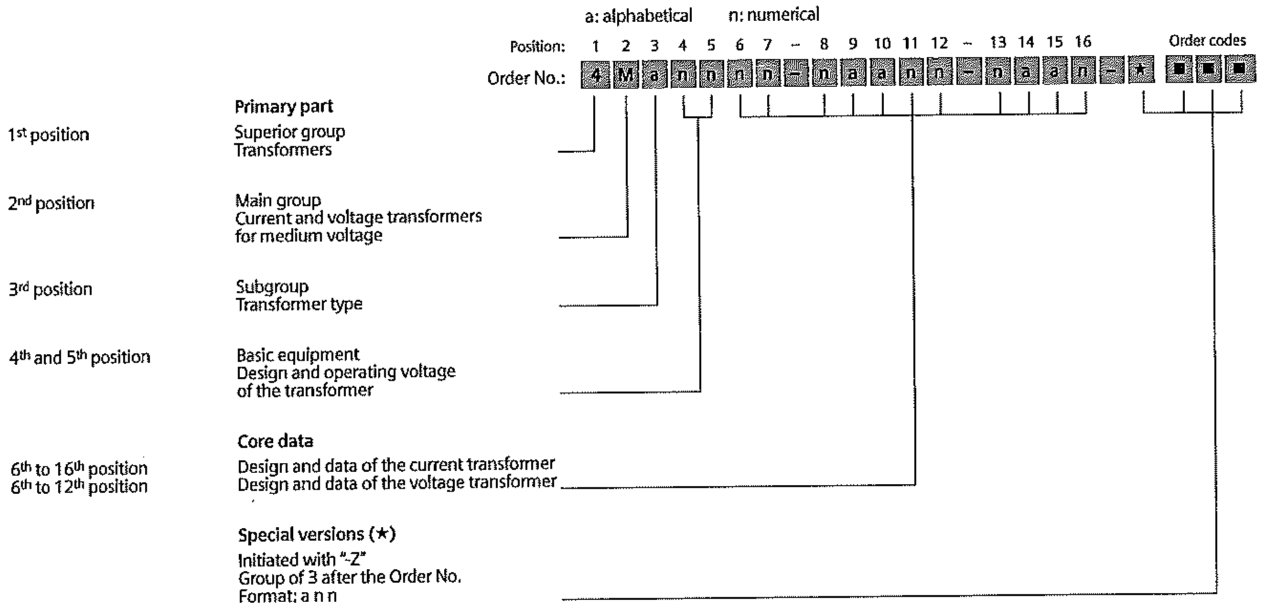
The transformers offered in the selection are only a part of the possible variations. If the transformer required is not shown, please clarify the feasibility with the responsible sales partner or the order processing department at the Switchgear Factory Berlin. The same applies to transformers according to the ANSI standard.

Order codes

Individual equipment versions, marked with **9** or **Z** in the 9th to 16th position, are explained more in detail by a 3-digit order code. Several order codes can be added to the order number in succession and in any sequence.

Built-on components and special versions (★)

For built-on components and special versions, "**-Z**" is added to the order number and a descriptive order code follows. If several built-on components and special versions are required, the suffix "**-Z**" is listed only once. If a requested special version is not in the catalog and can therefore not be ordered via order code, it has to be identified with **Y 9 9** after consultation. The agreement hereto is made directly between your responsible sales partner and the order processing department in the Switchgear Factory Berlin.



a: alphabetical n: numerical

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16			Order codes	
Order No.:	4	M	a	n	n	n	n	–	n	a	a	n	n	–	n	a	a	n	–	★	■	■ ■

	Primary part
1st position	Superior group Transformers
2nd position	Main group Current and voltage transformers for medium voltage
3rd position	Subgroup Transformer type
4th and 5th position	Basic equipment Design and operating voltage of the transformer
	Core data
6th to 16th position 6th to 12th position	Design and data of the current transformer Design and data of the voltage transformer
	Special versions (★) Initiated with "-Z" Group of 3 after the Order No. Format: a n n

Configuration example

At the end of each of the following pages with selection data you will find a configuration example to make the order number structure more clear.
Starting from the last selection of the basic type, this example is continued, so that at the end of the equipment selection a completely configured and orderable transformer results for every product group.

On the foldout page we offer a configuring aid. Here you can fill in the order number you have determined for your transformer.

Example for Order No.: 4 M A 7 2 4 4 – ■ ■ ■ ■ ■ – ■ ■ ■ ■

Order codes:

Current transformer, type of construction according to IEC [1]

Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16 – Order codes
Order No.: 4 M ■ ■ ■ ■ ■ – ■ ■ ■ ■ ■ – ■ ■ ■ ■ – ★ ■ ■ ■

Illustration	Type of design					
 	Indoor support-type current transformer, block-type design, small type according to DIN 42600, cast-resin insulated, operating voltage up to 12 kV, 24 kV or 36 kV	4	M	A	7	Selection from page **20ff**
 	Indoor support-type current transformer, single-turn design, cast-resin insulated, operating voltage up to 12 kV or 24 kV	4	M	B	1	Selection from page **41ff**
 	Indoor bushing-type current transformer, single-turn design, cast-resin insulated, operating voltage up to 12 kV, 24 kV or 36 kV	4	M	C	2	Selection from page **44ff**
 	Indoor bar-primary bushing-type current transformer, cast-resin insulated, operating voltage up to 12 kV, 24 kV or 36 kV	4	M	C	3	Selection from page **47ff**
 	Outdoor support-type current transformer, cast-resin insulated, operating voltage up to 12 kV, 24 kV or 36 kV	4	M	E	2	Selection from page **53ff**
 	Outdoor support-type current transformer, top-assembly type, operating voltage up to 12 kV, 24 kV, 36 kV and 52 kV	4	M	E	3	Selection from page **58ff**

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1) Transformers according to ANSI standard on request

Example for Order No.: 4 M A 7 ■ ■ ■ – ■ ■ ■ ■ ■ – ■ ■ ■ ■
Order codes:

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4MA7 indoor support-type current transformer, block-type design

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16	–		Order codes
Order No.:	4	M	A	7	■	■	■	–	■	■	■	■	■	–	■	■	■	■	–	★	■ ■ ■
									See page 21	See page 21	See page 22 to page 39						See page 40	See page 40		See page 40	

5th position
Operating voltage (maximum value)

Operating voltage U_m kV	Rated lightning impulse withstand voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Order No.	Order codes
12	75	28	4 M A 7 2	
17.5	95	38	4 M A 7 2	– Z F 1 8
24	125	50	4 M A 7 4	
36	170	70	4 M A 7 6	

6th/7th position
Rated short-time thermal current

Rated short-time thermal current I_{th} kA	Remark	Position 6	Position 7
8		3	3
12.5		4	0
16		4	4
20		4	8
25		5	4
31.5		5	7
40		6	3
50	Not for $U_m = 36$ kV	6	7
63	Not for $U_m = 24$ kV and $U_m = 36$ kV	7	1

Configuration example

Indoor support-type current transformer, block-type design	4 M A 7
Maximum operating voltage $U_m = 12$ kV Rated lightning impulse withstand voltage $U_p = 75$ kV Rated short-duration power-frequency withstand voltage $U_d = 28$ kV	2
Rated short-time thermal current $I_{th} = 16$ kA	4 4

Example for Order No.: 4 M A 7 2 4 4 – ■ ■ ■ ■ ■ – ■ ■ ■ ■

Order codes:

Equipment Selection

4MA7 indoor support-type current transformer, block-type design

8th/9th position
Rated primary current

Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16 Order codes

Order No.: 4 M A 7 ■ ■ ■ – ■ ■ ■ ■ ■ – ■ ■ ■ ■ – ★ ■ ■ ■

Positions 10 to 14: See page 22 to page 39

Position 15: See page 40

Position 16: See page 40

★: See page 40

Rated primary current I_{PN} A	Rated primary current, with primary multi-ratio I_{PN} A	Rated short-time thermal current I_{th} 8 kA	12.5 kA	16 kA	20 kA	25 kA	31.5 kA	40 kA	50 kA	63 kA	8	9
20		■	■	■							0	E
25		■	■	■	■						0	F
30		■	■	■	■						0	G
40		■	■	■	■	■	■				0	H
50		■	■	■	■	■	■	■			0	J
60		■	■	■	■	■	■	■	■		0	K
75		■	■	■	■	■	■	■	■	■	0	L
100		■	■	■	■	■	■	■	■	■	0	M
125		■	■	■	■	■	■	■	■	■	0	N
150		■	■	■	■	■	■	■	■	■	0	P
200		■	■	■	■	■	■	■	■	■	0	Q
250		■	■	■	■	■	■	■	■	■	0	R
300		■	■	■	■	■	■	■	■	■	0	S
400		■	■	■	■	■	■	■	■	■	0	T
500		■	■	■	■	■	■	■	■	■	0	U
600		■	■	■	■	■	■	■	■	■	0	V
750		■	■	■	■	■	■	■	■	■	0	W
800				■							0	X
1000		■	■	■	■	■	■	■	■	■	1	A
1200		■	■	■	■	■	■	■	■	■	1	B
1250		■	■	■	■	■	■	■	■	■	1	C
1500		■	■	■	■	■	■	■	■	■	1	D
2000		■	■	■	■	■	■	■	■	■	1	F
2500		■	■	■	■	■	■	■	■	■	1	G
	2x 20	■	■	■							3	E
	2x 25	■	■	■	■						3	F
	2x 30	■	■	■	■						3	G
	2x 40	■	■	■	■	■	■				3	H
	2x 50	■	■	■	■	■	■	■	■		3	J
	2x 60	■	■	■	■	■	■	■	■		3	K
	2x 75	■	■	■	■	■	■	■	■	■	3	L
	2x 100	■	■	■	■	■	■	■	■	■	3	M
	2x 125	■	■	■	■	■	■	■	■	■	3	N
	2x 150	■	■	■	■	■	■	■	■	■	3	P
	2x 200	■	■	■	■	■	■	■	■	■	3	Q
	2x 250	■	■	■	■	■	■	■	■	■	3	R
	2x 300	■	■	■	■	■	■	■	■	■	3	S
	2x 400	■	■	■	■	■	■	■	■	■	3	T
	2x 500	■	■	■	■	■	■	■	■	■	3	U
	2x 600	■	■	■	■	■	■	■	■	■	3	V
		Page 22	Page 24	Page 26	Page 28	Page 30	Page 32	Page 34	Page 36	Page 38		

■ Feasible (other combinations on request)

Configuration example
Indoor support-type current transformer, block-type design
(U_m = 12 kV, U_p = 75 kV, U_d = 28 kV, I_{th} = 16 kA)
Rated primary current I_{PN} = 100 A

4 M A 7
2 4 4 –
0 M

Example for Order No.: 4 M A 7 2 4 4 – 0 M ■ ■ ■ – ■ ■ ■ ■
Order codes:

2

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Equipment Selection

4MA7 indoor support-type current transformer, block-type design

8 kA

10th to 14th position

Core versions

Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16 Order codes

Order No.: 4 M A 7 ■ 3 3 – ■ ■ ■ ■ ■ – ■ ■ ■ ■ – ★ ■ ■ ■

s.p. 40 s.p. 40 s.p. 40

At rated primary current I_{PN}	Thermal strength	12
100 A 125 A 150 A 200 A 250 A 300 A 400 A 500 A 600 A 750 A 1000 A 1200 A 1250 A 1500 A 2000 A 2500 A	100 x I_{PN}	0
60 A 75 A	150 x I_{PN}	1
40 A 50 A	200 x I_{PN}	2
30 A	300 x I_{PN}	3
20 A 25 A	400 x I_{PN}	4

1st core			2nd core			Thermal strength									10	11	12	–	13	14
Class	Factor	VA rating	Class	Factor	VA rating	1000 x I_{PN}	800 x I_{PN}	600 x I_{PN}	500 x I_{PN}	400 x I_{PN}	300 x I_{PN}	200 x I_{PN}	150 x I_{PN}	100 x I_{PN}						
0.2	FS10	10								■	■	■	■	■	C	2		–	0	A
		15								■	■	■	■	■	C	3		–	0	A
0.5	FS5	10								■	■	■	■	■	E	2		–	0	A
		15								■	■	■	■	■	E	3		–	0	A
		30								■	■	■	■	■	E	4		–	0	A
1	FS5	10								■	■	■	■	■	H	2		–	0	A
		15								■	■	■	■	■	H	3		–	0	A
		30								■	■	■	■	■	H	4		–	0	A
5P	10	5								■	■	■	■	■	L	1		–	0	A
		10								■	■	■	■	■	L	2		–	0	A
		15								■	■	■	■	■	L	3		–	0	A
		30										■	■	■	L	4		–	0	A
10P	10	5								■	■	■	■	■	Q	1		–	0	A
		10								■	■	■	■	■	Q	2		–	0	A
		15								■	■	■	■	■	Q	3		–	0	A
		30									■	■	■	■	Q	4		–	0	A
0.5	FS5	5	5P	10	5					■	■	■	■	■	E	1		–	1	L
		10			10					■	■	■	■	■	E	2		–	2	L
		15			15								■	■	E	3		–	3	L
		30			30								■	■	E	4		–	4	L
0.5	FS5	5	10P	10	5					■	■	■	■	■	E	1		–	1	Q
		10			10					■	■	■	■	■	E	2		–	2	Q
		15			15								■	■	E	3		–	3	Q
		30			30								■	■	E	4		–	4	Q
1	FS5	5	5P	10	5					■	■	■	■	■	H	1		–	1	L
		10			10					■	■	■	■	■	H	2		–	2	L
		10			15						■	■	■	■	H	2		–	3	L
		15			15							■	■	■	H	3		–	3	L
		15			30								■	■	H	3		–	4	L
		30			30								■	■	H	4		–	4	L
1	FS5	5	10P	10	5					■	■	■	■	■	H	1		–	1	Q
		10			10					■	■	■	■	■	H	2		–	2	Q
		10			15						■	■	■	■	H	2		–	3	Q
		15			15							■	■	■	H	3		–	3	Q
		15			30							■	■	■	H	3		–	4	Q
		30			30								■	■	H	4		–	4	Q

■ Feasible (other combinations on request)

Configuration example

Indoor support-type current transformer, block-type design
(U_m = 12 kV, I_{th} = 8 kA, I_{PN} = 100 A)
Thermal strength 100 x I_{PN}
1st core class 5P; instrument security factor 10; rating 30 VA
2nd core without

4 M A 7
2 3 3 – 0 M
0
L 4 – 0 A

Example for Order No.: 4 M A 7 2 3 3 – 0 M L 4 0 – 0 A ■ ■

Order codes:

8 kA – with primary multi-ratio

10th to 14th position

Core versions

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16	–		Order codes
Order No.:	4	M	A	7	■	3	3	–	■	■	■	■	■	–	■	■	■	■	–	★	■ ■ ■
																	s. p. 40	s. p. 40		s. p. 40	

At rated primary current I_{PN}	Thermal strength	Position 12
2x 100 A 2x 125 A 2x 150 A 2x 200 A 2x 250 A 2x 300 A 2x 400 A 2x 500 A 2x 600 A	$100 \times I_{PN}$	0
2x 60 A 2x 75 A	$150 \times I_{PN}$	1
2x 40 A 2x 50 A	$200 \times I_{PN}$	2
2x 30 A	$300 \times I_{PN}$	3
2x 20 A 2x 25 A	$400 \times I_{PN}$	4

1st core			2nd core			Thermal strength									
Class	Factor	VA rating	Class	Factor	VA rating	$1000 \times I_{PN}$	$800 \times I_{PN}$	$600 \times I_{PN}$	$500 \times I_{PN}$	$400 \times I_{PN}$	$300 \times I_{PN}$	$200 \times I_{PN}$	$150 \times I_{PN}$	$100 \times I_{PN}$	
0.2	FS10	10								■	■	■	■	■	C 2 – 0 A
		15								■	■	■	■	■	C 3 – 0 A
0.5	FS5	10								■	■	■	■	■	E 2 – 0 A
		15								■	■	■	■	■	E 3 – 0 A
		30								■	■	■	■	■	E 4 – 0 A
1	FS5	10								■	■	■	■	■	H 2 – 0 A
		15								■	■	■	■	■	H 3 – 0 A
		30								■	■	■	■	■	H 4 – 0 A
5P	10	5								■	■	■	■	■	L 1 – 0 A
		10								■	■	■	■	■	L 2 – 0 A
		15								■	■	■	■	■	L 3 – 0 A
		30										■	■	■	L 4 – 0 A
10P	10	5								■	■	■	■	■	Q 1 – 0 A
		10								■	■	■	■	■	Q 2 – 0 A
		15								■	■	■	■	■	Q 3 – 0 A
		30									■	■	■	■	Q 4 – 0 A
0.5	FS5	5	5P	10	5					■	■	■	■	■	E 1 – 1 L
		10			10							■	■	■	E 2 – 2 L
		15			15							□	■	■	E 3 – 3 L
		30			30								■	■	E 4 – 4 L
0.5	FS5	5	10P	10	5					■	■	■	■	■	E 1 – 1 Q
		10			10							■	■	■	E 2 – 2 Q
		15			15								■	■	E 3 – 3 Q
		30			30								■	■	E 4 – 4 Q
1	FS5	5	5P	10	5					■	■	■	■	■	H 1 – 1 L
		10			10					■	■	■	■	■	H 2 – 2 L
		10			15						■	■	■	■	H 2 – 3 L
		15			15							■	■	■	H 3 – 3 L
		15			30							□	■	■	H 3 – 4 L
		30			30								■	■	H 4 – 4 L
1	FS5	5	10P	10	5					■	■	■	■	■	H 1 – 1 Q
		10			10					■	■	■	■	■	H 2 – 2 Q
		10			15						■	■	■	■	H 2 – 3 Q
		15			15							■	■	■	H 3 – 3 Q
		15			30							□	■	■	H 3 – 4 Q
		30			30								■	■	H 4 – 4 Q

■ Feasible (other combinations on request)

□ Not for 2x 40 A

Configuration example

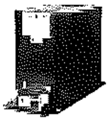
Indoor support-type current transformer, block-type design
($U_m = 12$ kV, $I_{th} = 8$ kA, $I_{PN} = 2x\ 100$ A)
Thermal strength $100 \times I_{PN}$
1st core class 1; instrument security factor FS5; rating 15 VA
2nd core class 10P; accuracy limit factor 10; rating 30 VA

4 M A 7
2 3 3 – 3 M
0
H 3 – 4 Q

Example for Order No.:	4	M	A	7	2	3	3	–	3	M	H	3	0	–	4	Q	■	■					
Order codes:																							

Equipment Selection

4MA7 indoor support-type current transformer, block-type design



12.5 kA

10^{th} to 14^{th} position

Core versions

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16			Order codes
Order No.:	4	M	A	7	■	4	0	–	■	■	■	■	■	–	■	■	■	■	–	★	■ ■ ■
																	s. p. 40	s. p. 40		s. p. 40	

At rated primary current I_{PN}	Thermal strength	
125 A 150 A 200 A 250 A 300 A 400 A 500 A 600 A 750 A 1000 A 1200 A 1250 A 1500 A 2000 A 2500 A	100 x I_{PN}	0
100 A	150 x I_{PN}	1
75 A	200 x I_{PN}	2
50 A 60 A	300 x I_{PN}	3
40 A	400 x I_{PN}	4
25 A 30 A	500 x I_{PN}	5
20 A	800 x I_{PN}	7

1st core			2nd core			Thermal strength									
Class	Factor	VA rating	Class	Factor	VA rating	1000 x I_{PN}	800 x I_{PN}	600 x I_{PN}	500 x I_{PN}	400 x I_{PN}	300 x I_{PN}	200 x I_{PN}	150 x I_{PN}	100 x I_{PN}	
0.2	FS10	10							■	■	■	■	■	■	C 2 – 0 A
		15							■	■	■	■	■	■	C 3 – 0 A
0.5	FS5	10					■		■	■	■	■	■	■	E 2 – 0 A
		15					■		■	■	■	■	■	■	E 3 – 0 A
		30							■	■	■	■	■	■	E 4 – 0 A
1	FS5	10					■		■	■	■	■	■	■	H 2 – 0 A
		15					■		■	■	■	■	■	■	H 3 – 0 A
		30							■	■	■	■	■	■	H 4 – 0 A
5P	10	5					■		■	■	■	■	■	■	L 1 – 0 A
		10							■	■	■	■	■	■	L 2 – 0 A
		15								■	■	■	■	■	L 3 – 0 A
		30										■	■	■	L 4 – 0 A
10P	10	5					■		■	■	■	■	■	■	Q 1 – 0 A
		10					■		■	■	■	■	■	■	Q 2 – 0 A
		15							■	■	■	■	■	■	Q 3 – 0 A
		30									■	■	■	■	Q 4 – 0 A
0.5	FS5	5	5P	10	5		■		■	■	■	■	■	■	E 1 – 1 L
		10			10				■	■	■	■	■	■	E 2 – 2 L
		15			15							■	■	■	E 3 – 3 L
		30			30								■	■	E 4 – 4 L
0.5	FS5	5	10P	10	5		■		■	■	■	■	■	■	E 1 – 1 Q
		10			10				■	■	■	■	■	■	E 2 – 2 Q
		15			15						■	■	■	■	E 3 – 3 Q
		30			30								■	■	E 4 – 4 Q
1	FS5	5	5P	10	5		■		■	■	■	■	■	■	H 1 – 1 L
		10			10				■	■	■	■	■	■	H 2 – 2 L
		10			15					■	■	■	■	■	H 2 – 3 L
		15			15					■	■	■	■	■	H 3 – 3 L
		15			30							■	■	■	H 3 – 4 L
		30			30								■	■	H 4 – 4 L
1	FS5	5	10P	10	5		■		■	■	■	■	■	■	H 1 – 1 Q
		10			10				■	■	■	■	■	■	H 2 – 2 Q
		10			15					■	■	■	■	■	H 2 – 3 Q
		15			15					■	■	■	■	■	H 3 – 3 Q
		15			30						■	■	■	■	H 3 – 4 Q
		30			30								■	■	H 4 – 4 Q

■ Feasible (other combinations on request)

Configuration example

Indoor support-type current transformer, block-type design
($U_m = 12$ kV, $I_{th} = 12.5$ kA, $I_{PN} = 100$ A)
Thermal strength 150 x I_{PN}
1st core class 10P; instrument security factor 10; rating 5 VA
2nd core without

4 M A 7
2 4 0 – 0 M
1
Q 1 – 0 A

Example for Order No.: 4 M A 7 2 4 0 – 0 M Q 1 1 – 0 A ■ ■
Order codes:

12.5 kA – with primary multi-ratio

10th to 14th position
Core versions

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16			Order codes		
Order No.:	4	M	A	7	■	4	0	–	■	■	■	■	■	–	■	■	■	■	–	★	■	■	■
																	s. p. 40	s. p. 40		s. p. 40			

At rated primary current I_{PN}	Thermal strength	12
2x 125 A 2x 150 A 2x 200 A 2x 250 A 2x 300 A 2x 400 A 2x 500 A 2x 600 A	100 x I_{PN}	0
2x 100 A	150 x I_{PN}	1
2x 75 A	200 x I_{PN}	2
2x 50 A 2x 60 A	300 x I_{PN}	3
2x 40 A	400 x I_{PN}	4
2x 25 A 2x 30 A	500 x I_{PN}	5
2x 20 A	800 x I_{PN}	7

1st core			2nd core			Thermal strength									10	11	12	–	13	14
Class	Factor	VA rating	Class	Factor	VA rating	1000 x I_{PN}	800 x I_{PN}	600 x I_{PN}	500 x I_{PN}	400 x I_{PN}	300 x I_{PN}	200 x I_{PN}	150 x I_{PN}	100 x I_{PN}						
0.2	FS10	10								■	■	■	■	■	C	2		–	0	A
		15								■	■	■	■	■	C	3		–	0	A
0.5	FS5	10					■		■	■	■	■	■	■	E	2		–	0	A
		15							■	■	■	■	■	■	E	3		–	0	A
		30								■	■	■	■	■	E	4		–	0	A
1	FS5	10					■		■	■	■	■	■	■	H	2		–	0	A
		15					■		■	■	■	■	■	■	H	3		–	0	A
		30							■	■	■	■	■	■	H	4		–	0	A
5P	10	5					■		■	■	■	■	■	■	L	1		–	0	A
		10							■	■	■	■	■	■	L	2		–	0	A
		15								■	■	■	■	■	L	3		–	0	A
		30										■	■	■	L	4		–	0	A
10P	10	5					■		■	■	■	■	■	■	Q	1		–	0	A
		10					■		■	■	■	■	■	■	Q	2		–	0	A
		15							■	■	■	■	■	■	Q	3		–	0	A
		30										■	■	■	Q	4		–	0	A
0.5	FS5	5	5P	10	5		■		■	■	■	■	■	■	E	1		–	1	L
		10			10						■	■	■	■	E	2		–	2	L
		15			15							■	■	■	E	3		–	3	L
		30			30								■	■	E	4		–	4	L
0.5	FS5	5	10P	10	5		■		■	■	■	■	■	■	E	1		–	1	Q
		10			10						■	■	■	■	E	2		–	2	Q
		15			15							■	■	■	E	3		–	3	Q
		30			30								■	■	E	4		–	4	Q
1	FS5	5	5P	10	5		■		■	■	■	■	■	■	H	1		–	1	L
		10			10				■	■	■	■	■	■	H	2		–	2	L
		10			15					■	■	■	■	■	H	2		–	3	L
		15			15						■	■	■	■	H	3		–	3	L
		15			30							■	■	■	H	3		–	4	L
		30			30								■	■	H	4		–	4	L
1	FS5	5	10P	10	5		■		■	■	■	■	■	■	H	1		–	1	Q
		10			10				■	■	■	■	■	■	H	2		–	2	Q
		10			15					■	■	■	■	■	H	2		–	3	Q
		15			15					■	■	■	■	■	H	3		–	3	Q
		15			30							■	■	■	H	3		–	4	Q
		30			30								■	■	H	4		–	4	Q

■ Feasible (other combinations on request)

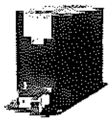
Configuration example
Indoor support-type current transformer, block-type design
(U_m = 12 kV, I_{th} = 12.5 kA, I_{PN} = 2x 100 A)
Thermal strength 150 x I_{PN}
1st core class 0.5; instrument security factor FS5; rating 15 VA
2nd core class 10P; accuracy limit factor 10; rating 15 VA

4 M A 7
2 4 0 – 3 M
1
E 3 – 3 Q

Example for Order No.: 4 M A 7 2 4 0 – 3 M E 3 1 – 3 Q ■ ■
Order codes:

Equipment Selection

4MA7 indoor support-type current transformer, block-type design



16 kA

10th to 14th position
Core versions

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16	–		Order codes		
Order No.:	4	M	A	7	■	4	4	–	■	■	■	■	■	–	■	■	■	■	–	★	■	■	■
																	s. p. 40	s. p. 40		s. p. 40			

At rated primary current I_{PN}	Thermal strength	10	11	12	–	13	14
200 A 250 A 300 A 400 A 500 A 600 A 750 A 800 A 1000 A 1200 A 1250 A 1500 A 2000 A 2500 A	100 x I_{PN}			0			
125 A 150 A	150 x I_{PN}			1			
100 A	200 x I_{PN}			2			
60 A 75 A	300 x I_{PN}			3			
40 A 50 A	400 x I_{PN}			4			
30 A	600 x I_{PN}			6			
25 A	800 x I_{PN}			7			
20 A	1000 x I_{PN}			8			

1st core			2nd core			Thermal strength									10	11	12	–	13	14
Class	Factor	VA rating	Class	Factor	VA rating	1000 x I_{PN}	800 x I_{PN}	600 x I_{PN}	500 x I_{PN}	400 x I_{PN}	300 x I_{PN}	200 x I_{PN}	150 x I_{PN}	100 x I_{PN}						
0.2	FS10	10								■	■	■	■	■	C	2		–	0	A
		15								■	■	■	■	■	C	3		–	0	A
0.5	FS5	10				■	■	■		■	■	■	■	■	E	2		–	0	A
		15					■	■		■	■	■	■	■	E	3		–	0	A
		30								■	■	■	■	■	E	4		–	0	A
1	FS5	10				■	■	■		■	■	■	■	■	H	2		–	0	A
		15				■	■	■		■	■	■	■	■	H	3		–	0	A
		30						■		■	■	■	■	■	H	4		–	0	A
5P	10	5				■	■	■		■	■	■	■	■	L	1		–	0	A
		10						■		■	■	■	■	■	L	2		–	0	A
		15								■	■	■	■	■	L	3		–	0	A
		30										■	■	■	L	4		–	0	A
10P	10	5				■	■	■		■	■	■	■	■	Q	1		–	0	A
		10				■	■	■		■	■	■	■	■	Q	2		–	0	A
		15						■		■	■	■	■	■	Q	3		–	0	A
		30									■	■	■	■	Q	4		–	0	A
0.5	FS5	5	5P	10	5		■	■		■	■	■	■	■	E	1		–	1	L
		10			10			■		■	■	■	■	■	E	2		–	2	L
		15			15							■	■	■	E	3		–	3	L
		30			30								■	■	E	4		–	4	L
0.5	FS5	5	10P	10	5		■	■		■	■	■	■	■	E	1		–	1	Q
		10			10					■	■	■	■	■	E	2		–	2	Q
		15			15						■	■	■	■	E	3		–	3	Q
		30			30							■	■	■	E	4		–	4	Q
1	FS5	5	5P	10	5	■	■	■		■	■	■	■	■	H	1		–	1	L
		10			10					■	■	■	■	■	H	2		–	2	L
		10			15						■	■	■	■	H	2		–	3	L
		15			15						■	■	■	■	H	3		–	3	L
		15			30							■	■	■	H	3		–	4	L
		30			30							■	■	■	H	4		–	4	L
1	FS5	5	10P	10	5	■	■	■		■	■	■	■	■	H	1		–	1	Q
		10			10					■	■	■	■	■	H	2		–	2	Q
		10			15						■	■	■	■	H	2		–	3	Q
		15			15						■	■	■	■	H	3		–	3	Q
		15			30							■	■	■	H	3		–	4	Q
		30			30							■	■	■	H	4		–	4	Q

■ Feasible (other combinations on request)

Configuration example
Indoor support-type current transformer, block-type design
(U_m = 12 kV, I_{th} = 16 kA, I_{PN} = 100 A)
Thermal strength 200 x I_{PN}
1st core class 0.5; instrument security factor FS5; rating 10 VA
2nd core class 5P; accuracy limit factor 10; rating 10 VA

4 M A 7
2 4 4 – 0 M
E 2 2 – 2 L

Example for Order No.:	4	M	A	7	2	4	4	–	0	M	E	2	2	–	2	L	■	■					
Order codes:																							

16 kA – with primary multi-ratio

10th to 14th position
Core versions

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16	–		Order codes
Order No.:	4	M	A	7	■	4	4	–	■	■	■	■	■	–	■	■	■	■	–	★	■ ■ ■
																	s. p. 40	s. p. 40		s. p. 40	

At rated primary current I_{PN}	Thermal strength	Position 12
2x 200 A 2x 250 A 2x 300 A 2x 400 A 2x 500 A 2x 600 A	100 x I_{PN}	0
2x 125 A 2x 150 A	150 x I_{PN}	1
2x 100 A	200 x I_{PN}	2
2x 60 A 2x 75 A	300 x I_{PN}	3
2x 40 A 2x 50 A	400 x I_{PN}	4
2x 30 A	600 x I_{PN}	6
2x 25 A	800 x I_{PN}	7
2x 20 A	1000 x I_{PN}	8

1st core			2nd core			Thermal strength									
Class	Factor	VA rating	Class	Factor	VA rating	1000 x I_{PN}	800 x I_{PN}	600 x I_{PN}	500 x I_{PN}	400 x I_{PN}	300 x I_{PN}	200 x I_{PN}	150 x I_{PN}	100 x I_{PN}	Position 10 11 12 – 13 14
0.2	FS10	10								■	■	■	■	■	C 2 – 0 A
		15								■	■	■	■	■	C 3 – 0 A
0.5	FS5	10				■	■	■		■	■	■	■	■	E 2 – 0 A
		15						■		■	■	■	■	■	E 3 – 0 A
		30								■	■	■	■	■	E 4 – 0 A
1	FS5	10				■	■	■		■	■	■	■	■	H 2 – 0 A
		15				■	■	■		■	■	■	■	■	H 3 – 0 A
		30								■	■	■	■	■	H 4 – 0 A
5P	10	5				■	■	■		■	■	■	■	■	L 1 – 0 A
		10						■		■	■	■	■	■	L 2 – 0 A
		15								■	■	■	■	■	L 3 – 0 A
		30										■	■	■	L 4 – 0 A
10P	10	5				■	■	■		■	■	■	■	■	Q 1 – 0 A
		10				■	■	■		■	■	■	■	■	Q 2 – 0 A
		15						■		■	■	■	■	■	Q 3 – 0 A
		30										■	■	■	Q 4 – 0 A
0.5	FS5	5	5P	10	5			■		■	■	■	■	■	E 1 – 1 L
		10			10						■	■	■	■	E 2 – 2 L
		15			15							■	■	■	E 3 – 3 L
		30			30								■	■	E 4 – 4 L
0.5	FS5	5	10P	10	5			■		■	■	■	■	■	E 1 – 1 Q
		10			10						■	■	■	■	E 2 – 2 Q
		15			15							■	■	■	E 3 – 3 Q
		30			30								■	■	E 4 – 4 Q
1	FS5	5	5P	10	5	■	■	■		■	■	■	■	■	H 1 – 1 L
		10			10					■	■	■	■	■	H 2 – 2 L
		10			15						■	■	■	■	H 2 – 3 L
		15			15						■	■	■	■	H 3 – 3 L
		15			30							■	■	■	H 3 – 4 L
		30			30								■	■	H 4 – 4 L
1	FS5	5	10P	10	5	■	■	■		■	■	■	■	■	H 1 – 1 Q
		10			10					■	■	■	■	■	H 2 – 2 Q
		10			15						■	■	■	■	H 2 – 3 Q
		15			15						■	■	■	■	H 3 – 3 Q
		15			30							■	■	■	H 3 – 4 Q
		30			30								■	■	H 4 – 4 Q

■ Feasible (other combinations on request)

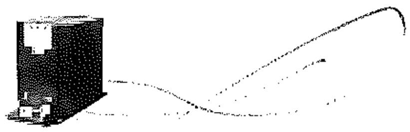
Configuration example
Indoor support-type current transformer, block-type design
(U_m = 12 kV, I_{th} = 16 kA, I_{PN} = 2x 100 A)
Thermal strength 200 x I_{PN}
1st core class 0.5; instrument security factor FS5; rating 10 VA
2nd core without

4 M A 7
2 4 4 – 3 M
2
E 2 – 0 A

Example for Order No.:	4 M A 7 2 4 4 – 3 M E 2 2 – 0 A ■ ■
Order codes:	

Equipment Selection

4MA7 indoor support-type current transformer, block-type design



20 kA

10th to 14th position
Core versions

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16			Order codes		
Order No.:	4	M	A	7	■	4	8	–	■	■	■	■	■	–	■	■	■	■	–	★	■	■	■
																	s. p. 40	s. p. 40		s. p. 40			

At rated primary current I_{PN}	Thermal strength	10	11	12	–	13	14
200 A 250 A 300 A 400 A 500 A 600 A 750 A 1000 A 1200 A 1250 A 1500 A 2000 A 2500 A	100 x I_{PN}			0			
150 A	150 x I_{PN}			1			
100 A 125 A	200 x I_{PN}			2			
75 A	300 x I_{PN}			3			
50 A 60 A	400 x I_{PN}			4			
40 A	500 x I_{PN}			5			
30 A	800 x I_{PN}			7			
25 A	1000 x I_{PN}			8			

1st core			2nd core			Thermal strength									10	11	12	–	13	14
Class	Factor	VA rating	Class	Factor	VA rating	1000 x I_{PN}	800 x I_{PN}	600 x I_{PN}	500 x I_{PN}	400 x I_{PN}	300 x I_{PN}	200 x I_{PN}	150 x I_{PN}	100 x I_{PN}						
0.2	FS10	10					■		■	■	■	■	■	■	C	2		–	0	A
		15								■	■	■	■	■	C	3		–	0	A
0.5	FS5	10				■	■		■	■	■	■	■	■	E	2		–	0	A
		15					■		■	■	■	■	■	■	E	3		–	0	A
		30							■	■	■	■	■	■	E	4		–	0	A
1	FS5	10				■	■		■	■	■	■	■	■	H	2		–	0	A
		15				■	■		■	■	■	■	■	■	H	3		–	0	A
		30							■	■	■	■	■	■	H	4		–	0	A
5P	10	5				■	■		■	■	■	■	■	■	L	1		–	0	A
		10							■	■	■	■	■	■	L	2		–	0	A
		15								■	■	■	■	■	L	3		–	0	A
		30										■	■	■	L	4		–	0	A
10P	10	5				■	■		■	■	■	■	■	■	Q	1		–	0	A
		10				■	■		■	■	■	■	■	■	Q	2		–	0	A
		15							■	■	■	■	■	■	Q	3		–	0	A
		30									■	■	■	■	Q	4		–	0	A
0.5	FS5	5	5P	10	5		■		■	■	■	■	■	■	E	1		–	1	L
		10			10					■	■	■	■	■	E	2		–	2	L
		15			15							■	■	■	E	3		–	3	L
		30			30									■	E	4		–	4	L
0.5	FS5	5	10P	10	5		■		■	■	■	■	■	■	E	1		–	1	Q
		10			10					■	■	■	■	■	E	2		–	2	Q
		15			15							■	■	■	E	3		–	3	Q
		30			30									■	E	4		–	4	Q
1	FS5	5	5P	10	5	■	■		■	■	■	■	■	■	H	1		–	1	L
		10			10					■	■	■	■	■	H	2		–	2	L
		10			15						■	■	■	■	H	2		–	3	L
		15			15						■	■	■	■	H	3		–	3	L
		15			30								■	■	H	3		–	4	L
		30			30									■	H	4		–	4	L
1	FS5	5	10P	10	5	■	■		■	■	■	■	■	■	H	1		–	1	Q
		10			10				■	■	■	■	■	■	H	2		–	2	Q
		10			15						■	■	■	■	H	2		–	3	Q
		15			15						■	■	■	■	H	3		–	3	Q
		15			30							■	■	■	H	3		–	4	Q
		30			30								■	■	H	4		–	4	Q

■ Feasible (other combinations on request)

Configuration example
Indoor support-type current transformer, block-type design
(U_m = 12 kV, I_{th} = 20 kA, I_{PN} = 100 A)
Thermal strength 200 x I_{PN}
1st core class 1; instrument security factor FS5; rating 10 VA
2nd core class 5P; accuracy limit factor 10; rating 15 VA

4 M A 7
2 4 8 – 0 M
2
H 2 – 3 L

Example for Order No.:	4	M	A	7	2	4	8	–	0	M	H	2	2	–	3	L	■	■					
Order codes:																							

20 kA – with primary multi-ratio

10th to 14th position
Core versions

Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16 – ★ Order codes
Order No.: 4 M A 7 ■ 4 8 – ■ ■ ■ ■ ■ – ■ ■ ■ ■ – ★ ■ ■ ■
15: s. p. 40; 16: s. p. 40; ★: s. p. 40

At rated primary current I_{PN}	Thermal strength	
2x 200 A 2x 250 A 2x 300 A 2x 400 A 2x 500 A 2x 600 A	100 x I_{PN}	0
2x 150 A	150 x I_{PN}	1
2x 100 A 2x 125 A	200 x I_{PN}	2
2x 75 A	300 x I_{PN}	3
2x 50 A 2x 60 A	400 x I_{PN}	4
2x 40 A	500 x I_{PN}	5
2x 30 A	800 x I_{PN}	7
2x 25 A	1000 x I_{PN}	8

1st core			2nd core			Thermal strength									
Class	Factor	VA rating	Class	Factor	VA rating	1000 x I_{PN}	800 x I_{PN}	600 x I_{PN}	500 x I_{PN}	400 x I_{PN}	300 x I_{PN}	200 x I_{PN}	150 x I_{PN}	100 x I_{PN}	
0.2	FS10	10								■	■	■	■	■	C 2 – 0 A
		15								■	■	■	■	■	C 3 – 0 A
0.5	FS5	10				■	■		■	■	■	■	■	■	E 2 – 0 A
		15							■	■	■	■	■	■	E 3 – 0 A
		30								■	■	■	■	■	E 4 – 0 A
1	FS5	10				■	■		■	■	■	■	■	■	H 2 – 0 A
		15				■	■		■	■	■	■	■	■	H 3 – 0 A
		30							■	■	■	■	■	■	H 4 – 0 A
5P	10	5				■	■		■	■	■	■	■	■	L 1 – 0 A
		10							■	■	■	■	■	■	L 2 – 0 A
		15								■	■	■	■	■	L 3 – 0 A
		30										■	■	■	L 4 – 0 A
10P	10	5				■	■		■	■	■	■	■	■	Q 1 – 0 A
		10					■		■	■	■	■	■	■	Q 2 – 0 A
		15							■	■	■	■	■	■	Q 3 – 0 A
		30										■	■	■	Q 4 – 0 A
0.5	FS5	5	5P	10	5				■	■	■	■	■	■	E 1 – 1 L
		10			10						■	■	■	■	E 2 – 2 L
		15			15							■	■	■	E 3 – 3 L
		30			30								■	■	E 4 – 4 L
0.5	FS5	5	10P	10	5				■	■	■	■	■	■	E 1 – 1 Q
		10			10				■		■	■	■	■	E 2 – 2 Q
		15			15							■	■	■	E 3 – 3 Q
		30			30								■	■	E 4 – 4 Q
1	FS5	5	5P	10	5	■	■		■	■	■	■	■	■	H 1 – 1 L
		10			10					■	■	■	■	■	H 2 – 2 L
		10			15						■	■	■	■	H 2 – 3 L
		15			15						■	■	■	■	H 3 – 3 L
		15			30								■	■	H 3 – 4 L
		30			30								■	■	H 4 – 4 L
1	FS5	5	10P	10	5	■	■		■	■	■	■	■	■	H 1 – 1 Q
		10			10					■	■	■	■	■	H 2 – 2 Q
		10			15						■	■	■	■	H 2 – 3 Q
		15			15						■	■	■	■	H 3 – 3 Q
		15			30								■	■	H 3 – 4 Q
		30			30								■	■	H 4 – 4 Q

■ Feasible (other combinations on request)

Configuration example

Indoor support-type current transformer, block-type design (U_m = 12 kV, I_{th} = 20 kA, I_{PN} = 2x 100 A)	4 M A 7 2 4 8 – 3 M
Thermal strength 200 x I_{PN}	2
1st core class 1; instrument security factor FS5; rating 5 VA 2nd core class 10P; accuracy limit factor 10; rating 5 VA	H 1 – 1 Q

Example for Order No.: 4 M A 7 2 4 8 – 3 M H 1 2 – 1 Q ■ ■
Order codes:

Equipment Selection

4MA7 indoor support-type current transformer, block-type design

25 kA

10th to 14th position
Core versions

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16			Order codes
Order No.:	4	M	A	7	■	5	4	–	■	■	■	■	■	–	■	■	■	■	–	★	■ ■ ■
																	s. p. 40	s. p. 40		s. p. 40	

At rated primary current I_{PN}	Thermal strength	
250 A 300 A 400 A 500 A 600 A 750 A 1000 A 1200 A 1250 A 1500 A 2000 A 2500 A	100 x I_{PN}	0
200 A	150 x I_{PN}	1
125 A 150 A	200 x I_{PN}	2
100 A	300 x I_{PN}	3
75 A	400 x I_{PN}	4
50 A 60 A	500 x I_{PN}	5
40 A	800 x I_{PN}	7

1st core			2nd core			Thermal strength									
Class	Factor	VA rating	Class	Factor	VA rating	1000 x I_{PN}	800 x I_{PN}	600 x I_{PN}	500 x I_{PN}	400 x I_{PN}	300 x I_{PN}	200 x I_{PN}	150 x I_{PN}	100 x I_{PN}	
0.2	FS10	10							■	■	■	■	■	■	C 2 – 0 A
		15								■	■	■	■	■	C 3 – 0 A
0.5	FS5	10					■		■	■	■	■	■	■	E 2 – 0 A
		15							■	■	■	■	■	■	E 3 – 0 A
		30							■	■	■	■	■	■	E 4 – 0 A
1	FS5	10					■		■	■	■	■	■	■	H 2 – 0 A
		15					■		■	■	■	■	■	■	H 3 – 0 A
		30							■	■	■	■	■	■	H 4 – 0 A
5P	10	5					■		■	■	■	■	■	■	L 1 – 0 A
		10							■	■	■	■	■	■	L 2 – 0 A
		15								■	■	■	■	■	L 3 – 0 A
		30										■	■	■	L 4 – 0 A
10P	10	5					■		■	■	■	■	■	■	Q 1 – 0 A
		10					■		■	■	■	■	■	■	Q 2 – 0 A
		15							■	■	■	■	■	■	Q 3 – 0 A
		30									■	■	■	■	Q 4 – 0 A
0.5	FS5	5	5P	10	5		■		■	■	■	■	■	■	E 1 – 1 L
		10			10					■	■	■	■	■	E 2 – 2 L
		15			15							■	■	■	E 3 – 3 L
		30			30									■	E 4 – 4 L
0.5	FS5	5	10P	10	5		■		■	■	■	■	■	■	E 1 – 1 Q
		10			10					■	■	■	■	■	E 2 – 2 Q
		15			15							■	■	■	E 3 – 3 Q
		30			30									■	E 4 – 4 Q
1	FS5	5	5P	10	5		■		■	■	■	■	■	■	H 1 – 1 L
		10			10					■	■	■	■	■	H 2 – 2 L
		10			15						■	■	■	■	H 2 – 3 L
		15			15						■	■	■	■	H 3 – 3 L
		15			30								■	■	H 3 – 4 L
		30			30									■	H 4 – 4 L
1	FS5	5	10P	10	5		■		■	■	■	■	■	■	H 1 – 1 Q
		10			10				■	■	■	■	■	■	H 2 – 2 Q
		10			15						■	■	■	■	H 2 – 3 Q
		15			15						■	■	■	■	H 3 – 3 Q
		15			30							■	■	■	H 3 – 4 Q
		30			30								■	■	H 4 – 4 Q

■ Feasible (other combinations on request)

Configuration example
Indoor support-type current transformer, block-type design
(U_m = 12 kV, I_{th} = 25 kA, I_{PN} = 100 A)
Thermal strength 300 x I_{PN}
1st core class **10P**; instrument security factor **10**; rating **15 VA**
2nd core **without**

4 M A 7
2 5 4 – 0 M
3
Q 3 – 0 A

Example for Order No.: 4 M A 7 2 5 4 – 0 M Q 3 3 – 0 A ■ ■
Order codes:

399

25 kA – with primary multi-ratio

10th to 14th position
Core versions

	Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16			Order codes
	Order No.:	4	M	A	7	■	5	4	–	■	■	■	■	■	–	■	■	■ s. p. 40	■ s. p. 40	–	★ s. p. 40	■ ■ ■

At rated primary current I_{PN}	Thermal strength	Position 12
2x 250 A 2x 300 A 2x 400 A 2x 500 A 2x 600 A	100 x I_{PN}	0
2x 200 A	150 x I_{PN}	1
2x 125 A 2x 150 A	200 x I_{PN}	2
2x 100 A	300 x I_{PN}	3
2x 75 A	400 x I_{PN}	4
2x 50 A 2x 60 A	500 x I_{PN}	5
2x 40 A	800 x I_{PN}	7

1st core			2nd core			Thermal strength									Order No. (positions 10 11 12 – 13 14)
Class	Factor	VA rating	Class	Factor	VA rating	1000 x I_{PN}	800 x I_{PN}	600 x I_{PN}	500 x I_{PN}	400 x I_{PN}	300 x I_{PN}	200 x I_{PN}	150 x I_{PN}	100 x I_{PN}	
0.2	FS10	10							■	■	■	■	■	■	C 2 – 0 A
		15								■	■	■	■	■	C 3 – 0 A
0.5	FS5	10					■		■	■	■	■	■	■	E 2 – 0 A
		15							■	■	■	■	■	■	E 3 – 0 A
		30							■	■	■	■	■	■	E 4 – 0 A
1	FS5	10					■		■	■	■	■	■	■	H 2 – 0 A
		15					■		■	■	■	■	■	■	H 3 – 0 A
		30							■	■	■	■	■	■	H 4 – 0 A
5P	10	5					■		■	■	■	■	■	■	L 1 – 0 A
		10							■	■	■	■	■	■	L 2 – 0 A
		15								■	■	■	■	■	L 3 – 0 A
		30										■	■	■	L 4 – 0 A
10P	10	5					■		■	■	■	■	■	■	Q 1 – 0 A
		10							■	■	■	■	■	■	Q 2 – 0 A
		15							■	■	■	■	■	■	Q 3 – 0 A
		30										■	■	■	Q 4 – 0 A
0.5	FS5	5	5P	10	5				■	■	■	■	■	■	E 1 – 1 L
		10			10						■	■	■	■	E 2 – 2 L
		15			15							■	■	■	E 3 – 3 L
		30			30								■	■	E 4 – 4 L
0.5	FS5	5	10P	10	5		■		■	■	■	■	■	■	E 1 – 1 Q
		10			10					■	■	■	■	■	E 2 – 2 Q
		15			15							■	■	■	E 3 – 3 Q
		30			30								■	■	E 4 – 4 Q
1	FS5	5	5P	10	5		■		■	■	■	■	■	■	H 1 – 1 L
		10			10					■	■	■	■	■	H 2 – 2 L
		10			15						■	■	■	■	H 2 – 3 L
		15			15						■	■	■	■	H 3 – 3 L
		15			30								■	■	H 3 – 4 L
		30			30								■	■	H 4 – 4 L
1	FS5	5	10P	10	5		■		■	■	■	■	■	■	H 1 – 1 Q
		10			10				■	■	■	■	■	■	H 2 – 2 Q
		10			15						■	■	■	■	H 2 – 3 Q
		15			15						■	■	■	■	H 3 – 3 Q
		15			30								■	■	H 3 – 4 Q
		30			30								■	■	H 4 – 4 Q

■ Feasible (other combinations on request)

Configuration example
Indoor support-type current transformer, block-type design
(U_m = 12 kV, I_{th} = 25 kA, I_{PN} = 2x 100 A)
Thermal strength 300 x I_{PN}
1st core class 10P; instrument security factor 10; rating 15 VA
2nd core without

4 M A 7
2 5 4 – 3 M
3
Q 3 – 0 A

Example for Order No.: 4 M A 7 2 5 4 – 3 M Q 3 3 – 0 A ■ ■
Order codes:

400

Equipment Selection

4MA7 indoor support-type current transformer, block-type design

31.5 kA

10th to 14th position
Core versions

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16	–		Order codes		
Order No.:	4	M	A	7	■	5	7	–	■	■	■	■	■	–	■	■	■	■	–	★	■	■	■
																	s. p. 40	s. p. 40		s. p. 40			

At rated primary current I_{PN}	Thermal strength	12
400 A 500 A 600 A 750 A 1000 A 1200 A 1250 A 1500 A 2000 A 2500 A	100 x I_{PN}	0
250 A 300 A	150 x I_{PN}	1
200 A	200 x I_{PN}	2
125 A 150 A	300 x I_{PN}	3
100 A	400 x I_{PN}	4
75 A	500 x I_{PN}	5
60 A	600 x I_{PN}	6
50 A	800 x I_{PN}	7
40 A	1000 x I_{PN}	8

1st core			2nd core			Thermal strength														
Class	Factor	VA rating	Class	Factor	VA rating	1000 x I_{PN}	800 x I_{PN}	600 x I_{PN}	500 x I_{PN}	400 x I_{PN}	300 x I_{PN}	200 x I_{PN}	150 x I_{PN}	100 x I_{PN}	10	11	12	–	13	14
0.2	FS10	10							■	■	■	■	■	■	C	2		–	0	A
		15								■	■	■	■	■	C	3		–	0	A
0.5	FS5	10				■	■	■	■	■	■	■	■	■	E	2		–	0	A
		15					■	■	■	■	■	■	■	■	E	3		–	0	A
		30							■	■	■	■	■	■	E	4		–	0	A
1	FS5	10				■	■	■	■	■	■	■	■	■	H	2		–	0	A
		15					■	■	■	■	■	■	■	■	H	3		–	0	A
		30							■	■	■	■	■	■	H	4		–	0	A
5P	10	5				■	■	■	■	■	■	■	■	■	L	1		–	0	A
		10							■	■	■	■	■	■	L	2		–	0	A
		15								■	■	■	■	■	L	3		–	0	A
		30										■	■	■	L	4		–	0	A
10P	10	5				■	■	■	■	■	■	■	■	■	Q	1		–	0	A
		10				■	■	■	■	■	■	■	■	■	Q	2		–	0	A
		15							■	■	■	■	■	■	Q	3		–	0	A
		30									■	■	■	■	Q	4		–	0	A
0.5	FS5	5	5P	10	5		■	■	■	■	■	■	■	■	E	1		–	1	L
		10			10					■	■	■	■	■	E	2		–	2	L
		15			15							■	■	■	E	3		–	3	L
		30			30									■	E	4		–	4	L
0.5	FS5	5	10P	10	5		■	■	■	■	■	■	■	■	E	1		–	1	Q
		10			10				■	■	■	■	■	■	E	2		–	2	Q
		15			15							■	■	■	E	3		–	3	Q
		30			30									■	E	4		–	4	Q
1	FS5	5	5P	10	5	■	■	■	■	■	■	■	■	■	H	1		–	1	L
		10			10					■	■	■	■	■	H	2		–	2	L
		10			15						■	■	■	■	H	2		–	3	L
		15			15						■	■	■	■	H	3		–	3	L
		15			30								■	■	H	3		–	4	L
		30			30									■	H	4		–	4	L
1	FS5	5	10P	10	5	■	■	■	■	■	■	■	■	■	H	1		–	1	Q
		10			10				■	■	■	■	■	■	H	2		–	2	Q
		10			15						■	■	■	■	H	2		–	3	Q
		15			15						■	■	■	■	H	3		–	3	Q
		15			30							■	■	■	H	3		–	4	Q
		30			30								■	■	H	4		–	4	Q

■ Feasible (other combinations on request)

Configuration example

Indoor support-type current transformer, block-type design
(U_m = 12 kV, I_{th} = 31.5 kA, I_{PN} = 100 A)
Thermal strength 400 x I_{PN}
1st core class 0.2; instrument security factor FS10; rating 15 VA
2nd core without

4 M A 7
2 5 7 – 0 M
4
C 3 – 0 A

Example for Order No.: 4 M A 7 2 5 7 – 0 M C 3 4 – 0 A ■ ■
Order codes:

401

31,5 kA – with primary multi-ratio

10th to 14th position

Core versions

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16			Order codes
Order No.:	4	M	A	7	■	5	7	–	■	■	■	■	■	–	■	■	■	■	–	★	■ ■ ■
																	s. p. 40	s. p. 40		s. p. 40	

At rated primary current I_{PN}				Thermal strength	12
2x 300 A	2x 400 A	2x 500 A	2x 600 A	100 x I_{PN}	0
250 A	300 A			150 x I_{PN}	1
200 A				200 x I_{PN}	2
125 A	150 A			300 x I_{PN}	3
100 A				400 x I_{PN}	4
75 A				500 x I_{PN}	5
60 A				600 x I_{PN}	6
50 A				800 x I_{PN}	7
40 A				1000 x I_{PN}	8

1st core			2nd core			Thermal strength														
Class	Factor	VA rating	Class	Factor	VA rating	1000 x I_{PN}	800 x I_{PN}	600 x I_{PN}	500 x I_{PN}	400 x I_{PN}	300 x I_{PN}	200 x I_{PN}	150 x I_{PN}	100 x I_{PN}	10	11	12	–	13	14
0.2	FS10	10						■	■	■	■	■	■	■	C	2		–	0	A
		15							■	■	■	■	■	■	C	3		–	0	A
0.5	FS5	10				■	■	■	■	■	■	■	■	■	E	2		–	0	A
		15					■	■	■	■	■	■	■	■	E	3		–	0	A
		30						■	■	■	■	■	■	■	E	4		–	0	A
1	FS5	10				■	■	■	■	■	■	■	■	■	H	2		–	0	A
		15				■	■	■	■	■	■	■	■	■	H	3		–	0	A
		30						■	■	■	■	■	■	■	H	4		–	0	A
5P	10	5				■	■	■	■	■	■	■	■	■	L	1		–	0	A
		10						■	■	■	■	■	■	■	L	2		–	0	A
		15							■	■	■	■	■	■	L	3		–	0	A
		30									■	■	■	■	L	4		–	0	A
10P	10	5				■	■	■	■	■	■	■	■	■	Q	1		–	0	A
		10					■	■	■	■	■	■	■	■	Q	2		–	0	A
		15						■	■	■	■	■	■	■	Q	3		–	0	A
		30									■	■	■	■	Q	4		–	0	A
0.5	FS5	5	5P	10	5		■	■	■	■	■	■	■	■	E	1		–	1	L
		10			10					■	■	■	■	■	E	2		–	2	L
		15			15							■	■	■	E	3		–	3	L
		30			30							■	■	■	E	4		–	4	L
0.5	FS5	5	10P	10	5		■	■	■	■	■	■	■	■	E	1		–	1	Q
		10			10					■	■	■	■	■	E	2		–	2	Q
		15			15							■	■	■	E	3		–	3	Q
		30			30								■	■	E	4		–	4	Q
1	FS5	5	5P	10	5	■	■	■	■	■	■	■	■	■	H	1		–	1	L
		10			10				■	■	■	■	■	■	H	2		–	2	L
		10			15						■	■	■	■	H	2		–	3	L
		15			15						■	■	■	■	H	3		–	3	L
		15			30								■	■	H	3		–	4	L
		30			30								■	■	H	4		–	4	L
1	FS5	5	10P	10	5	■	■	■	■	■	■	■	■	■	H	1		–	1	Q
		10			10				■	■	■	■	■	■	H	2		–	2	Q
		10			15						■	■	■	■	H	2		–	3	Q
		15			15						■	■	■	■	H	3		–	3	Q
		15			30							■	■	■	H	3		–	4	Q
		30			30								■	■	H	4		–	4	Q

■ Feasible (other combinations on request)

Configuration example

Indoor support-type current transformer, block-type design
(U_m = 12 kV, I_{th} = 31.5 kA, I_{PN} = 2x 100 A)
Thermal strength 400 x I_{PN}
1st core class 0.5; instrument security factor FS5; rating 5 VA
2nd core class 10P; accuracy limit factor 10; rating 5 VA

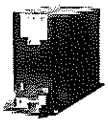
4 M A 7
2 5 7 – 3 M
4
E 1 – 1 Q

Example for Order No.: 4 M A 7 2 5 7 – 3 M E 1 4 – 1 Q ■ ■
Order codes:

2

Equipment Selection

4MA7 indoor support-type current transformer, block-type design



40 kA

10th to 14th position
Core versions

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16	–		Order codes
Order No.:	4	M	A	7	■	6	3	–	■	■	■	■	■	–	■	■	■	■	–	★	■ ■ ■
																	s. p. 40	s. p. 40		s. p. 40	

At rated primary current I_{PN}	Thermal strength	11
400 A 500 A 600 A 750 A 1000 A 1200 A 1250 A 1500 A 2000 A 2500 A	100 x I_{PN}	0
300 A	150 x I_{PN}	1
200 A 250 A	200 x I_{PN}	2
150 A	300 x I_{PN}	3
100 A 125 A	400 x I_{PN}	4
75 A	600 x I_{PN}	6
60 A	800 x I_{PN}	7
50 A	1000 x I_{PN}	8

1st core			2nd core			Thermal strength									10	11	12	–	13	14
Class	Factor	VA rating	Class	Factor	VA rating	1000 x I_{PN}	800 x I_{PN}	600 x I_{PN}	500 x I_{PN}	400 x I_{PN}	300 x I_{PN}	200 x I_{PN}	150 x I_{PN}	100 x I_{PN}						
0.2	FS10	10						■		■	■	■	■	■	C	2		–	0	A
		15								■	■	■	■	■	C	3		–	0	A
0.5	FS5	10				■	■	■		■	■	■	■	■	E	2		–	0	A
		15				■	■	■		■	■	■	■	■	E	3		–	0	A
		30								■	■	■	■	■	E	4		–	0	A
1	FS5	10				■	■	■		■	■	■	■	■	H	2		–	0	A
		15				■	■	■		■	■	■	■	■	H	3		–	0	A
		30								■	■	■	■	■	H	4		–	0	A
5P	10	5				■	■	■		■	■	■	■	■	L	1		–	0	A
		10								■	■	■	■	■	L	2		–	0	A
		15								■	■	■	■	■	L	3		–	0	A
		30										■	■	■	L	4		–	0	A
10P	10	5				■	■	■		■	■	■	■	■	Q	1		–	0	A
		10					■	■		■	■	■	■	■	Q	2		–	0	A
		15						■		■	■	■	■	■	Q	3		–	0	A
		30									■	■	■	■	Q	4		–	0	A
0.5	FS5	5	5P	10	5	■	■	■		■	■	■	■	■	E	1		–	1	L
		10			10					■	■	■	■	■	E	2		–	2	L
		15			15							■	■	■	E	3		–	3	L
		30			30									■	E	4		–	4	L
0.5	FS5	5	10P	10	5	■	■	■		■	■	■	■	■	E	1		–	1	Q
		10			10					■	■	■	■	■	E	2		–	2	Q
		15			15							■	■	■	E	3		–	3	Q
		30			30									■	E	4		–	4	Q
1	FS5	5	5P	10	5	■	■	■		■	■	■	■	■	H	1		–	1	L
		10			10					■	■	■	■	■	H	2		–	2	L
		10			15						■	■	■	■	H	2		–	3	L
		15			15						■	■	■	■	H	3		–	3	L
		15			30								■	■	H	3		–	4	L
		30			30									■	H	4		–	4	L
1	FS5	5	10P	10	5	■	■	■		■	■	■	■	■	H	1		–	1	Q
		10			10					■	■	■	■	■	H	2		–	2	Q
		10			15						■	■	■	■	H	2		–	3	Q
		15			15						■	■	■	■	H	3		–	3	Q
		15			30							■	■	■	H	3		–	4	Q
		30			30								■	■	H	4		–	4	Q

■ Feasible (other combinations on request)

Configuration example
Indoor support-type current transformer, block-type design
(U_m = 12 kV, I_{th} = 40 kA, I_{PN} = 100 A) — 4 M A 7
Thermal strength 400 x I_{PN} — 2 6 3 – 0 M
1st core class 1; instrument security factor FS5; rating 5 VA — 4
2nd core class 5P; accuracy limit factor 10; rating 5 VA — E 1 – 1 L

Example for Order No.: 4 M A 7 2 6 3 – 0 M E 1 4 – 1 L ■ ■
Order codes:

403

40 kA – with primary multi-ratio

10th to 14th position
Core versions

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16	–		Order codes
Order No.:	4	M	A	7	■	6	3	–	■	■	■	■	■	–	■	■	■	■	–	★	■ ■ ■
																	s. p. 40	s. p. 40		s. p. 40	

At rated primary current I_{PN}	Thermal strength	12
2x 400 A 2x 500 2x 600 A	100 x I_{PN}	0
2x 300 A	150 x I_{PN}	1
2x 200 A 2x 250 A	200 x I_{PN}	2
2x 150 A	300 x I_{PN}	3
2x 100 A 2x 125 A	400 x I_{PN}	4
2x 75 A	600 x I_{PN}	6
2x 60 A	800 x I_{PN}	7
2x 50 A	1000 x I_{PN}	8

1st core			2nd core			Thermal strength									10	11	12	–	13	14
Class	Factor	VA rating	Class	Factor	VA rating	1000 x I_{PN}	800 x I_{PN}	600 x I_{PN}	500 x I_{PN}	400 x I_{PN}	300 x I_{PN}	200 x I_{PN}	150 x I_{PN}	100 x I_{PN}						
0.2	FS10	10						■		■	■	■	■	■	C	2		–	0	A
		15								■	■	■	■	■	C	3		–	0	A
0.5	FS5	10				■	■	■		■	■	■	■	■	E	2		–	0	A
		15					■	■		■	■	■	■	■	E	3		–	0	A
		30						■		■	■	■	■	■	E	4		–	0	A
1	FS5	10				■	■	■		■	■	■	■	■	H	2		–	0	A
		15				■	■	■		■	■	■	■	■	H	3		–	0	A
		30						■		■	■	■	■	■	H	4		–	0	A
5P	10	5				■	■	■		■	■	■	■	■	L	1		–	0	A
		10						■		■	■	■	■	■	L	2		–	0	A
		15								■	■	■	■	■	L	3		–	0	A
		30										■	■	■	L	4		–	0	A
10P	10	5				■	■	■		■	■	■	■	■	Q	1		–	0	A
		10					■	■		■	■	■	■	■	Q	2		–	0	A
		15						■		■	■	■	■	■	Q	3		–	0	A
		30									■	■	■	■	Q	4		–	0	A
0.5	FS5	5	5P	10	5		■	■		■	■	■	■	■	E	1		–	1	L
		10			10						■	■	■	■	E	2		–	2	L
		15			15							■	■	■	E	3		–	3	L
		30			30								■	■	E	4		–	4	L
0.5	FS5	5	10P	10	5		■	■		■	■	■	■	■	E	1		–	1	Q
		10			10					■	■	■	■	■	E	2		–	2	Q
		15			15							■	■	■	E	3		–	3	Q
		30			30								■	■	E	4		–	4	Q
1	FS5	5	5P	10	5	■	■	■		■	■	■	■	■	H	1		–	1	L
		10			10					■	■	■	■	■	H	2		–	2	L
		10			15						■	■	■	■	H	2		–	3	L
		15			15						■	■	■	■	H	3		–	3	L
		15			30								■	■	H	3		–	4	L
		30			30								■	■	H	4		–	4	L
1	FS5	5	10P	10	5	■	■	■		■	■	■	■	■	H	1		–	1	Q
		10			10					■	■	■	■	■	H	2		–	2	Q
		10			15						■	■	■	■	H	2		–	3	Q
		15			15						■	■	■	■	H	3		–	3	Q
		15			30								■	■	H	3		–	4	Q
		30			30								■	■	H	4		–	4	Q

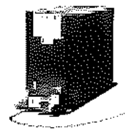
■ Feasible (other combinations on request)

Configuration example
Indoor support-type current transformer, block-type design
(U_m = 12 kV, I_{th} = 40 kA, I_{PN} = 2x 100 A)
Thermal strength 400 x I_{PN}
1st core class 0.2; instrument security factor FS10; rating 10 VA
2nd core without

	4	M	A	7														
					2	6	3	–	3	M								
													4					
											C	2		–	0	A		
Example for Order No.:	4	M	A	7	2	6	3	–	3	M	C	2	4	–	0	A	■	■
Order codes:																		

Equipment Selection

4MA7 indoor support-type current transformer, block-type design



50 kA

10th to 14th position
Core versions

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16			Order codes
Order No.:	4	M	A	7	■	6	7	–	■	■	■	■	■	–	■	■	■	■	–	★	■ ■ ■
																	s. p. 40	s. p. 40		s. p. 40	

At rated primary current I_{PN}	Thermal strength	10	11	12	–	13	14
500 A 600 A 750 A 1000 A 1200 A 1250 A 1500 A 2000 A 2500 A	100 x I_{PN}			0			
400 A	150 x I_{PN}			1			
250 A 300 A	200 x I_{PN}			2			
200 A	300 x I_{PN}			3			
125 A 150 A	400 x I_{PN}			4			
100 A	500 x I_{PN}			5			
75 A	800 x I_{PN}			7			
60 A	1000 x I_{PN}			8			

1st core			2nd core			Thermal strength														
Class	Factor	VA rating	Class	Factor	VA rating	1000 x I_{PN}	800 x I_{PN}	600 x I_{PN}	500 x I_{PN}	400 x I_{PN}	300 x I_{PN}	200 x I_{PN}	150 x I_{PN}	100 x I_{PN}	10	11	12	–	13	14
0.2	FS10	10							■	■	■	■	■	■	C	2		–	0	A
		15								■	■	■	■	■	C	3		–	0	A
0.5	FS5	10				■	■		■	■	■	■	■	■	E	2		–	0	A
		15					■		■	■	■	■	■	■	E	3		–	0	A
		30							■	■	■	■	■	■	E	4		–	0	A
1	FS5	10				■	■		■	■	■	■	■	■	H	2		–	0	A
		15				■	■		■	■	■	■	■	■	H	3		–	0	A
		30							■	■	■	■	■	■	H	4		–	0	A
5P	10	5				■	■		■	■	■	■	■	■	L	1		–	0	A
		10							■	■	■	■	■	■	L	2		–	0	A
		15								■	■	■	■	■	L	3		–	0	A
		30										■	■	■	L	4		–	0	A
10P	10	5				■	■		■	■	■	■	■	■	Q	1		–	0	A
		10					■		■	■	■	■	■	■	Q	2		–	0	A
		15							■	■	■	■	■	■	Q	3		–	0	A
		30									■	■	■	■	Q	4		–	0	A
0.5	FS5	5	5P	10	5		■		■	■	■	■	■	■	E	1		–	1	L
		10			10					■	■	■	■	■	E	2		–	2	L
		15			15							■	■	■	E	3		–	3	L
		30			30									■	E	4		–	4	L
0.5	FS5	5	10P	10	5		■		■	■	■	■	■	■	E	1		–	1	Q
		10			10					■	■	■	■	■	E	2		–	2	Q
		15			15						■	■	■	■	E	3		–	3	Q
		30			30									■	E	4		–	4	Q
1	FS5	5	5P	10	5		■		■	■	■	■	■	■	H	1		–	1	L
		10			10					■	■	■	■	■	H	2		–	2	L
		10			15						■	■	■	■	H	2		–	3	L
		15			15						■	■	■	■	H	3		–	3	L
		15			30								■	■	H	3		–	4	L
		30			30									■	H	4		–	4	L
1	FS5	5	10P	10	5		■		■	■	■	■	■	■	H	1		–	1	Q
		10			10				■	■	■	■	■	■	H	2		–	2	Q
		10			15						■	■	■	■	H	2		–	3	Q
		15			15						■	■	■	■	H	3		–	3	Q
		15			30							■	■	■	H	3		–	4	Q
		30			30								■	■	H	4		–	4	Q

■ Feasible (other combinations on request)

Configuration example

Indoor support-type current transformer, block-type design	4MA7			
(U_m = 12 kV, I_{th} = 50 kA, I_{PN} = 100 A)	267–0M			
Thermal strength 500 x I_{PN}			5	
1st core class 0.5; instrument security factor FS5; rating 5 VA 2nd core class 5P; accuracy limit factor 10; rating 5 VA		E1		–1L

Example for Order No.: 4 M A 7 2 6 7 – 0 M E 1 5 – 1 L ■ ■

Order codes:

50 kA – with primary multi-ratio

10th to 14th position
Core versions

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16			Order codes		
Order No.:	4	M	A	7	■	6	7	–	■	■	■	■	■	–	■	■	■	■	–	★	■	■	■
																	s. p. 40	s. p. 40		s. p. 40			

At rated primary current I_{PN}	Thermal strength	12
2x 500 A 2x 600 A	100 x I_{PN}	0
2x 400 A	150 x I_{PN}	1
2x 250 A 2x 300 A	200 x I_{PN}	2
2x 200 A	300 x I_{PN}	3
2x 125 A 2x 150 A	400 x I_{PN}	4
2x 100 A	500 x I_{PN}	5
2x 75 A	800 x I_{PN}	7
2x 50 A 2x 60 A	1000 x I_{PN}	8

1st core			2nd core			Thermal strength														
Class	Factor	VA rating	Class	Factor	VA rating	1000 x I_{PN}	800 x I_{PN}	600 x I_{PN}	500 x I_{PN}	400 x I_{PN}	300 x I_{PN}	200 x I_{PN}	150 x I_{PN}	100 x I_{PN}	10	11	12	–	13	14
0.2	FS10	10							■	■	■	■	■	■	C	2		–	0	A
		15								■	■	■	■	■	C	3		–	0	A
0.5	FS5	10				■	■		■	■	■	■	■	■	E	2		–	0	A
		15					■		■	■	■	■	■	■	E	3		–	0	A
		30							■	■	■	■	■	■	E	4		–	0	A
1	FS5	10				■	■		■	■	■	■	■	■	H	2		–	0	A
		15				■	■		■	■	■	■	■	■	H	3		–	0	A
		30							■	■	■	■	■	■	H	4		–	0	A
5P	10	5				■	■		■	■	■	■	■	■	L	1		–	0	A
		10							■	■	■	■	■	■	L	2		–	0	A
		15								■	■	■	■	■	L	3		–	0	A
		30										■	■	■	L	4		–	0	A
10P	10	5				■	■		■	■	■	■	■	■	Q	1		–	0	A
		10							■	■	■	■	■	■	Q	2		–	0	A
		15								■	■	■	■	■	Q	3		–	0	A
		30										■	■	■	Q	4		–	0	A
0.5	FS5	5	5P	10	5		■		■	■	■	■	■	■	E	1		–	1	L
		10			10					■	■	■	■	■	E	2		–	2	L
		15			15								■	■	E	3		–	3	L
		30			30								■	■	E	4		–	4	L
0.5	FS5	5	10P	10	5		■		■	■	■	■	■	■	E	1		–	1	Q
		10			10					■	■	■	■	■	E	2		–	2	Q
		15			15							■	■	■	E	3		–	3	Q
		30			30								■	■	E	4		–	4	Q
1	FS5	5	5P	10	5		■		■	■	■	■	■	■	H	1		–	1	L
		10			10					■	■	■	■	■	H	2		–	2	L
		10			15							■	■	■	H	2		–	3	L
		15			15							■	■	■	H	3		–	3	L
		15			30								■	■	H	3		–	4	L
		30			30								■	■	H	4		–	4	L
1	FS5	5	10P	10	5		■		■	■	■	■	■	■	H	1		–	1	Q
		10			10				■	■	■	■	■	■	H	2		–	2	Q
		10			15						■	■	■	■	H	2		–	3	Q
		15			15						■	■	■	■	H	3		–	3	Q
		15			30							■	■	■	H	3		–	4	Q
		30			30								■	■	H	4		–	4	Q

■ Feasible (other combinations on request)

Configuration example
Indoor support-type current transformer, block-type design
(U_m = 12 kV, I_{th} = 50 kA, I_{PN} = 2x 100 A)
Thermal strength 500 x I_{PN}
1st core class 0.5; instrument security factor FS5; rating 5 VA
2nd core class 5P; accuracy limit factor 10; rating 5 VA

4 M A 7
2 6 7 – 3 M
5
E 1 – 1 L

Example for Order No.: 4 M A 7 2 6 7 – 3 M E 1 5 – 1 L ■ ■
Order codes:

Equipment Selection

4MA7 indoor support-type current transformer, block-type design

63 kA

10th to 14th position

Core versions

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16			Order codes
Order No.:	4	M	A	7	■	7	1	–	■	■	■	■	■	–	■	■	■	■	–	★	■ ■ ■
																	s. p. 40	s. p. 40		s. p. 40	

At rated primary current I_{PN}	Thermal strength	12
750 A 1000 A 1200 A 1250 A 1500 A 2000 A 2500 A	100 x I_{PN}	0
500 A 600 A	150 x I_{PN}	1
400 A	200 x I_{PN}	2
250 A 300 A	300 x I_{PN}	3
200 A	400 x I_{PN}	4
125 A 150 A	500 x I_{PN}	5
100 A	800 x I_{PN}	7
75 A	1000 x I_{PN}	8

1st core			2nd core			Thermal strength														
Class	Factor	VA rating	Class	Factor	VA rating	1000 x I_{PN}	800 x I_{PN}	600 x I_{PN}	500 x I_{PN}	400 x I_{PN}	300 x I_{PN}	200 x I_{PN}	150 x I_{PN}	100 x I_{PN}	10	11	12	–	13	14
0.2	FS10	10							■	■	■	■	■	■	C	2		–	0	A
		15								■	■	■	■	■	C	3		–	0	A
0.5	FS5	10				■	■		■	■	■	■	■	■	E	2		–	0	A
		15					■		■	■	■	■	■	■	E	3		–	0	A
		30							■	■	■	■	■	■	E	4		–	0	A
1	FS5	10				■	■		■	■	■	■	■	■	H	2		–	0	A
		15				■	■		■	■	■	■	■	■	H	3		–	0	A
		30							■	■	■	■	■	■	H	4		–	0	A
5P	10	5				■	■		■	■	■	■	■	■	L	1		–	0	A
		10							■	■	■	■	■	■	L	2		–	0	A
		15								■	■	■	■	■	L	3		–	0	A
		30										■	■	■	L	4		–	0	A
10P	10	5				■	■		■	■	■	■	■	■	Q	1		–	0	A
		10					■		■	■	■	■	■	■	Q	2		–	0	A
		15							■	■	■	■	■	■	Q	3		–	0	A
		30									■	■	■	■	Q	4		–	0	A
0.5	FS5	5	5P	10	5		■		■	■	■	■	■	■	E	1		–	1	L
		10			10					■	■	■	■	■	E	2		–	2	L
		15			15							■	■	■	E	3		–	3	L
		30			30									■	E	4		–	4	L
0.5	FS5	5	10P	10	5		■		■	■	■	■	■	■	E	1		–	1	Q
		10			10					■	■	■	■	■	E	2		–	2	Q
		15			15							■	■	■	E	3		–	3	Q
		30			30									■	E	4		–	4	Q
1	FS5	5	5P	10	5		■		■	■	■	■	■	■	H	1		–	1	L
		10			10					■	■	■	■	■	H	2		–	2	L
		10			15					■	■	■	■	■	H	2		–	3	L
		15			15						■	■	■	■	H	3		–	3	L
		15			30								■	■	H	3		–	4	L
		30			30									■	H	4		–	4	L
1	FS5	5	10P	10	5		■		■	■	■	■	■	■	H	1		–	1	Q
		10			10				■	■	■	■	■	■	H	2		–	2	Q
		10			15					■	■	■	■	■	H	2		–	3	Q
		15			15						■	■	■	■	H	3		–	3	Q
		15			30							■	■	■	H	3		–	4	Q
		30			30								■	■	H	4		–	4	Q

■ Feasible (other combinations on request)

Configuration example

Indoor support-type current transformer, block-type design
(U_m = 12 kV, I_{th} = 63 kA, I_{PN} = 100 A)
Thermal strength 800 x I_{PN}
1st core class 0.5; instrument security factor FS5; rating 15 VA
2nd core without

4 M A 7
2 7 1 – 0 M
7
E 3 – 0 A

Example for Order No.:	4	M	A	7	2	7	1	–	0	M	E	3	7	–	0	A	■	■					
Order codes:																							

63 kA – with primary multi-ratio

10th to 14th position
Core versions

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16	–		Order codes		
Order No.:	4	M	A	7	■	7	1	–	■	■	■	■	■	–	■	■	■	■	–	★	■	■	■
																	s. p. 40	s. p. 40		s. p. 40			

At rated primary current I_{PN}	Thermal strength	12
2x 500 A 2x 600 A	150 x I_{PN}	1
2x 400 A	200 x I_{PN}	2
2x 250 A 2x 300 A	300 x I_{PN}	3
2x 200 A	400 x I_{PN}	4
2x 125 A 2x 150 A	500 x I_{PN}	5
2x 100 A	800 x I_{PN}	7
2x 75 A	1000 x I_{PN}	8

1st core			2nd core			Thermal strength														
Class	Factor	VA rating	Class	Factor	VA rating	1000 x I_{PN}	800 x I_{PN}	600 x I_{PN}	500 x I_{PN}	400 x I_{PN}	300 x I_{PN}	200 x I_{PN}	150 x I_{PN}	100 x I_{PN}	10	11	12	–	13	14
0.2	FS10	10							■	■	■	■	■		C	2		–	0	A
		15								■	■	■	■		C	3		–	0	A
0.5	FS5	10				■	■		■	■	■	■	■		E	2		–	0	A
		15					■		■	■	■	■	■		E	3		–	0	A
		30							■	■	■	■	■		E	4		–	0	A
1	FS5	10				■	■		■	■	■	■	■		H	2		–	0	A
		15				■	■		■	■	■	■	■		H	3		–	0	A
		30								■	■	■	■		H	4		–	0	A
5P	10	5				■	■		■	■	■	■	■		L	1		–	0	A
		10							■	■	■	■	■		L	2		–	0	A
		15							☐	■	■	■	■		L	3		–	0	A
		30										■	■		L	4		–	0	A
10P	10	5				■	■		■	■	■	■	■		Q	1		–	0	A
		10					■		■	■	■	■	■		Q	2		–	0	A
		15							■	■	■	■	■		Q	3		–	0	A
		30									■	■	■		Q	4		–	0	A
0.5	FS5	5	5P	10	5		■		■	■	■	■	■		E	1		–	1	L
		10			10					■	■	■	■		E	2		–	2	L
		15			15							■	■		E	3		–	3	L
		30			30								■		E	4		–	4	L
0.5	FS5	5	10P	10	5		■		■	■	■	■	■		E	1		–	1	Q
		10			10					■	■	■	■		E	2		–	2	Q
		15			15							■	■		E	3		–	3	Q
		30			30								■		E	4		–	4	Q
1	FS5	5	5P	10	5		■		■	■	■	■	■		H	1		–	1	L
		10			10					■	■	■	■		H	2		–	2	L
		10			15					■	■	■	■		H	2		–	3	L
		15			15						■	■	■		H	3		–	3	L
		15			30								■		H	3		–	4	L
		30			30								■		H	4		–	4	L
1	FS5	5	10P	10	5		■		■	■	■	■	■		H	1		–	1	Q
		10			10				■	■	■	■	■		H	2		–	2	Q
		10			15					■	■	■	■		H	2		–	3	Q
		15			15						■	■	■		H	3		–	3	Q
		15			30							■	■		H	3		–	4	Q
		30			30								■		H	4		–	4	Q

■ Feasible (other combinations on request) ☐ Not for 2x 125 A

Configuration example
Indoor support-type current transformer, block-type design
(U_m = 12 kV, I_{th} = 63 kA, I_{PN} = 2x 100 A)
Thermal strength 800 x I_{PN}
1st core class 0.5; instrument security factor FS5; rating 5 VA
2nd core class 10P; accuracy limit factor 10; rating 5 VA

4 M A 7
2 7 1 – 3 M
7
E 1 – 1 Q

Example for Order No.:	4	M	A	7	2	7	1	–	3	M	E	1	7	–	1	Q	■	■					
Order codes:																							

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Equipment Selection

4MA7 indoor support-type current transformer, block-type design

Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16 – Order codes

Order No.: 4 M A 7 ■ ■ ■ – ■ ■ ■ ■ ■ – ■ ■ ■ ■ – ★ ■ ■ ■

15th position
Rated secondary current

Rated current for 1st core	Rated current for 2nd core	
1 A	Without 2nd core	0 A A
5 A	Without 2nd core	0 A B
1 A	1 A	C
5 A	5 A	D
1 A	5 A	E
5 A	1 A	F

16th position
Additional features

Options	
50 Hz, VDE marking	0
50 Hz, IEC marking	1
50 Hz, VDE marking with approval 1)	2
60 Hz, IEC marking	6
Further not listed special versions (only after consultation with the order processing department in the Switchgear Factory Berlin). Information additionally in clear text.	9

1) Only for class 0.2 and 0.5

Special versions

Options			
With routine test certificate in German/English		– Z	A 1 0
With capacitive layer for voltage detecting system	6 kV	– Z	C 0 6
	10 kV	– Z	C 1 0
	15 kV	– Z	C 1 5
Differential earth-fault balance in protection core		– Z	D 1 0
Other special versions on request			

Configuration example

Indoor support-type current transformer, block-type design	4 M A 7
Maximum operating voltage $U_m = 12$ kV	
Rated lightning impulse withstand voltage $U_p = 75$ kV	
Rated short-duration power-frequency withstand voltage $U_d = 28$ kV	2
Rated short-time thermal current $I_{th} = 63$ kA	7 1 –
Rated primary current $I_{PN} = 2 \times 100$ A	3 M
Thermal strength $800 \times I_{PN}$	7
1st core class 0.5; instrument security factor FS5; rating 5 VA	
2nd core class 10P; accuracy limit factor 10; rating 5 VA	E 1 – 1 Q
Rated secondary current 1st core 1A; 2nd core 5A	F
Power frequency 50 Hz; marking according to IEC	1
With routine test certificate in German/English	– Z A 1 0
With capacitive layer for voltage detecting system 10 kV	– Z C 1 0

Example for Order No.: 4 M A 7 2 7 1 – 3 M E 1 7 – 1 Q F 1 – Z

Order codes: A 1 0 + C 1 0

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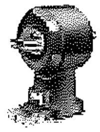

4MB1 indoor support-type current transformer, single-turn design

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16	–		Order codes
Order No.:	4	M	B	1	■	■	■	–	■	■	■	■	■	–	■	■	■	■	–	★	■ ■ ■
											See page 42	See page 42	See page 42		See page 42	See page 42	See page 43	See page 43		See page 43	

5th position
Operating voltage (maximum value)

Operating voltage U_m kV	Rated lightning impulse withstand voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Order No.
12	75	28	4 M B 1 2
17.5	95	38	4 M B 1 3
24	128	50	4 M B 1 4

6th/7th position
Rated short-time thermal current

Rated short-time thermal current I_{th} kA	Position 6	Position 7
150	7	8
200	8	2
250	8	4
300	8	5
500	8	8

8th/9th position
Rated primary current

Rated primary current I_N A	Remark	Rated short-time thermal current 150 kA	200 kA	250 kA	300 kA	500 kA	Position 8	Position 9
1500		■					1	D
2000			■				1	F
2500				■			1	G
3000					■		1	H
4000						■	1	J
5000	Only 4MB13					■	1	K
6000	Only 4MB13					■	1	L

■ Feasible (other combinations on request)

Configuration example
Indoor support-type current transformer, single-turn design — 4 M B 1
Maximum operating voltage U_m = 24 kV
Rated lightning impulse withstand voltage U_p = 125 kV
Rated short-duration power-frequency withstand voltage U_d = 50 kV — 4
Rated short-time thermal current I_{th} = 300 kA — 8 5 –
Rated primary current I_{PN} = 3000 A — 1 H

Example for Order No.: 4 M B 1 4 8 5 – 1 H ■ ■ ■ – ■ ■ ■ ■
Order codes:

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Equipment Selection

4MB1 indoor support-type current transformer, single-turn design

10th to 14th position
Core versions

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16			Order codes
Order No.:	4	M	B	1	■	■	■	–	■	■	■	■	■	–	■	■	■	■	–	★	■ ■ ■
																	See page 43	See page 43		See page 43	

At rated primary current I_{PN}	Thermal strength	12
1500 A 2000 A 2500 A 3000 A 4000 A 5000 A 6000 A	100 x I_{PN}	0

1st core			2nd core			Rated primary current I_{PN}							
Class	Factor	VA rating	Class	Factor	VA rating	1500 A	2000 A	2500 A	3000 A	4000 A	5000 A	6000 A	
0.2	FS10	15				■	■	■	■	■	■	■	C 3 – 0 A
		30				■	■	■	■	■	■	■	C 4 – 0 A
0.5	FS10	15				■	■	■	■	■	■	■	F 3 – 0 A
		30				■	■	■	■	■	■	■	F 4 – 0 A
		60				■	■	■	■	■	■	■	F 6 – 0 A
1	FS10	15				■	■	■	■	■	■	■	J 3 – 0 A
		30				■	■	■	■	■	■	■	J 4 – 0 A
		60				■	■	■	■	■	■	■	J 6 – 0 A
5P	10	30				■	■	■	■	■	■	■	L 4 – 0 A
		60				■	■	■	■	■	■	■	L 6 – 0 A
10P	10	30				■	■	■	■	■	■	■	Q 4 – 0 A
		60				■	■	■	■	■	■	■	Q 6 – 0 A
0.5	FS10	15	5P	10	15	■	■	■	■	■	■	■	F 3 – 3 L
		30			30	■	■	■	■	■	■	■	F 4 – 4 L
		30			60						■	■	F 6 – 6 L
1	FS10	15	5P	10	15	■	■	■	■	■	■	■	J 3 – 3 L
		30			30	■	■	■	■	■	■	■	J 4 – 4 L
		60			60						■	■	J 6 – 6 L
0.5	FS10	15	10P	10	15	■	■	■	■	■	■	■	F 3 – 3 Q
		30			30	■	■	■	■	■	■	■	F 4 – 4 Q
		60			60						■	■	F 6 – 6 Q
1	FS10	15	10P	10	15	■	■	■	■	■	■	■	J 3 – 3 Q
		30			30	■	■	■	■	■	■	■	J 4 – 4 Q
		60			60						■	■	J 6 – 6 Q

■ Feasible (other combinations on request)

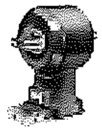
Configuration example
Indoor support-type current transformer, single-turn design
(U_m = 24 kV, I_{th} = 300 kA, I_{PN} = 3000 A)
Thermal strength 100 x I_{PN}
1st core class 0.5; instrument security factor FS10; rating 30 VA
2nd core class 5P; accuracy limit factor 10; rating 30 VA

4 M B 1
4 8 5 – 1 H
0
F 4 – 4 L

Example for Order No.: 4 M B 1 4 8 5 – 1 H F 4 0 – 4 L ■ ■
Order codes:

Equipment Selection

4MB1 indoor support-type current transformer, single-turn design



Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16			Order codes		
Order No.:	4	M	B	1	■	■	■	–	■	■	■	■	■	–	■	■	■	■	–	★	■	■	■

15th position
Rated secondary current

Rated current for 1st core	Rated current for 2nd core	Position 13 14 15
1 A	Without 2nd core	0 A A
5 A	Without 2nd core	0 A B
1 A	1 A	C
5 A	5 A	D
1 A	5 A	E
5 A	1 A	F

16th position
Additional features

Options	Position 16
50 Hz, VDE marking	0
50 Hz, IEC marking	1
50 Hz, VDE marking with approval 1)	2
60 Hz, IEC marking	6
Further not listed special versions (only after consultation with the order processing department in the Switchgear Factory Berlin). Information additionally in clear text.	9

1) Only for class 0.2 and 0.5

2

Special versions

Options	Order codes
With routine test certificate in German/English	– Z A 1 0
Other special versions on request	

Configuration example

Indoor support-type current transformer, single-turn design	4 M B 1
Maximum operating voltage U_m = 24 kV	
Rated lightning impulse withstand voltage U_p = 125 kV	
Rated short-duration power-frequency withstand voltage U_d = 50 kV	4
Rated short-time thermal current I_{th} = 300 kA	8 5 –
Rated primary current I_{PN} = 3000 A	1 H
Thermal strength 100 x I_{PN}	0
1st core class 0.5; instrument security factor FS10; rating 30 VA	
2nd core class 5P; accuracy limit factor 10; rating 30 VA	F 4 – 4 L
Rated secondary current 1st core 5 A; 2nd core 5 A	D
Power frequency 60 Hz; marking according to IEC	6

Example for Order No.:	4 M B 1 4 8 5 – 1 H F 4 0 – 4 L D 6
Order codes:	

4MC2 indoor bushing-type current transformer, single-turn design

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16	–		Order codes
Order No.:	4	M	C	2	■	■	■	–	■	■	■	■	■	–	■	■	■	■	–	*	■ ■ ■
											See page 45	See page 45	See page 45		See page 45	See page 45	See page 46	See page 46		See page 46	

5th position
Operating voltage (maximum value)

Operating voltage U_m kV	Rated lightning impulse withstand voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Order No.
12	75	28	4 M C 2 2
24	125	50	4 M C 2 4
36	170	70	4 M C 2 6

6th to 9th position
Rated short-time thermal current/
Rated primary current

Rated short-time thermal current I_{th} kA	Rated primary current I_{PN} A	Order No.
15	150	4 3 – 0 P
20	200	4 8 – 0 Q
30	300	5 6 – 0 S
40	400	6 3 – 0 T
50	500	6 7 – 0 U
60	600	7 0 – 0 V
80	800	7 3 – 0 X
100	1000	7 5 – 1 A
120	1200	7 6 – 1 B
150	1500	7 8 – 1 D
200	2000	8 2 – 1 F
250	2500	8 4 – 1 G
300	3000	8 5 – 1 H

Configuration example

Indoor bushing-type current transformer, single-turn design	4 M C 2
Maximum operating voltage U_m = 36 kV Rated lightning impulse withstand voltage U_p = 170 kV Rated short-duration power-frequency withstand voltage U_d = 70 kV	6
Rated short-time thermal current I_{th} = 50 kA Rated primary current I_{PN} = 500 A	6 7 – 0 U

Example for Order No.: 4 M C 2 6 6 7 – 0 U ■ ■ ■ – ■ ■ ■ ■
Order codes:

Equipment Selection

4MC2 indoor bushing-type current transformer, single-turn design

10th to 14th position
Core versions

		Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16			Order codes		
		Order No.:	4	M	C	2	■	■	■	–	■	■	■	■	■	–	■	■	■	■	–	★	■	■	■
At rated primary current I_{PN}	Thermal strength																		See page 46	See page 46		See page 46			
150 A 200 A 300 A 400 A 500 A 600 A 800 A 1000 A 1200 A 1500 A 2000 A 2500 A 3000 A	100 x I_{PN}														0										

1st core			2nd core			Rated primary current I_{PN}					10	11	12	–	13	14
Class	Factor	VA rating	Class	Factor	VA rating	150 A	200 A	300–600 A	800–1500 A	2000–3000 A						
0.2	FS10	10				■	■	■	■	■	C	2		–	0	A
		15				■	■	■	■	■	C	3		–	0	A
0.5	FS5	15				■	■	■	■		E	3		–	0	A
		30				■	■	■	■	■	E	4		–	0	A
0.5	FS10	15								■	F	3		–	0	A
1	FS5	15				■	■	■	■		H	3		–	0	A
		30				■	■	■	■	■	H	4		–	0	A
1	FS10	15								■	J	3		–	0	A
10P	10	15				■	■	■	■	■	Q	3		–	0	A
		30				■	■	■	■	■	Q	4		–	0	A
		60				■	■	■	■	■	Q	6		–	0	A
0.2	FS10	10	10P	10	30	■	■	■	■	■	C	2		–	4	Q
		15			30	■	■	■	■	■	C	3		–	4	Q
0.5	FS5	15	10P	10	15	■	■	■	■		E	3		–	3	Q
		15			30	■	■	■	■		E	3		–	4	Q
		30			30	■	■	■	■	■	E	4		–	4	Q
		30			60		■	■	■	■	E	4		–	6	Q
0.5	FS10	15	10P	10	15					■	F	3		–	3	Q
		15			30					■	F	3		–	4	Q
1	FS5	15	10P	10	15	■	■	■	■		H	3		–	3	Q
		15			30	■	■	■	■		H	3		–	4	Q
		30			30	■	■	■	■	■	H	4		–	4	Q
		30			60		■	■	■	■	H	4		–	6	Q
1	FS10	15	10P	10	15					■	J	3		–	3	Q
		15			30					■	J	3		–	4	Q

■ Feasible (other combinations on request)

Configuration example

Indoor bushing-type current transformer, single-turn design
(U_m = 36 kV, I_{th} = 50 kA, I_{PN} = 500 A)
Thermal strength 100 x I_{PN}
1st core class 1; instrument security factor FS5; rating 30 VA
2nd core class 10P; accuracy limit factor 10; rating 30 VA

4 M C 2
6 6 7 – 0 U
0
H 4 – 4 Q

Example for Order No.: 4 M C 2 6 6 7 – 0 U H 4 0 – 4 Q ■ ■

Order codes:

Equipment Selection

4MC2 indoor bushing-type current transformer, single-turn design

Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16 Order codes

Order No.: 4 M C 2 ■ ■ ■ – ■ ■ ■ ■ ■ – ■ ■ ■ ■ – ★ ■ ■ ■

15th position
Rated secondary current

Rated current for 1st core	Rated current for 2nd core	13	14	15
1 A	Without 2nd core	0	A	A
5 A	Without 2nd core	0	A	B
1 A	1 A			C
5 A	5 A			D
1 A	5 A			E
5 A	1 A			F

16th position
Additional features

Options	16
50 Hz, VDE marking	0
50 Hz, IEC marking	1
50 Hz, VDE marking with approval [1]	2
60 Hz, IEC marking	6
Further not listed special versions (only after consultation with the order processing department in the Switchgear Factory Berlin). Information additionally in clear text.	9

[1] Only for class 0.2 and 0.5

Special versions

Options	Order codes
With routine test certificate in German/English	– Z A 1 0
Other special versions on request	

Configuration example

Indoor bushing-type current transformer, single-turn design	4 M C 2
Maximum operating voltage $U_m = 36$ kV	
Rated lightning impulse withstand voltage $U_p = 170$ kV	
Rated short-duration power-frequency withstand voltage $U_d = 70$ kV	6
Rated short-time thermal current $I_{th} = 50$ kA	6 7 –
Rated primary current $I_{PN} = 500$ A	0 U
Thermal strength 100 x I_{PN}	0
1st core class 1; instrument security factor FS5; rating 30 VA	
2nd core class 10P; accuracy limit factor 10; rating 30 VA	H 4 – 4 Q
Rated secondary current 1st core 5 A; 2nd core 1 A	F
Power frequency 50 Hz; marking according to VDE	0

Example for Order No.: 4 M C 2 6 6 7 – 0 U H 4 0 – 4 Q F 0

Order codes:

4MC3 indoor bar-primary bushing-type current transformer

Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16 – Order codes

Order No.: 4 M C 3 ■ ■ ■ – ■ ■ ■ ■ ■ – ■ ■ ■ ■ – ★ ■ ■ ■

Position 10: See page 48
Position 11: See page 48
Position 12: See page 48
Position 13: See page 48
Position 14: See page 48
Position 15: See page 49
Position 16: See page 49
★: See page 49

5th position
Operating voltage (maximum value)

Operating voltage U_m kV	Rated lightning impulse withstand voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Order No.
12	75	28	4 M C 3 2
24	125	50	4 M C 3 4
36	170	70	4 M C 3 6

6th to 9th position
Rated short-time thermal current/ Rated primary current

Rated short-time thermal current I_{th} kA	Rated primary current I_{PN} A	Order No.
200	2000	8 2 – 1 F
250	2500	8 4 – 1 G
300	3000	8 5 – 1 H
400	4000	8 7 – 1 J
500	5000	8 8 – 1 K
600	6000	7 0 – 1 L
800	8000	7 2 – 1 N
1000	10000	7 3 – 1 P

Configuration example
Indoor bar-primary bushing-type current transformer — 4 M C 3
Maximum operating voltage U_m = 12 kV
Rated lightning impulse withstand voltage U_p = 75 kV
Rated short-duration power-frequency withstand voltage U_d = 28 kV — 2
Rated short-time thermal current I_{th} = 400 kA
Rated primary current I_{PN} = 4000 A — 8 7 – 1 J

Example for Order No.: 4 M C 3 2 8 7 – 1 J ■ ■ ■ – ■ ■ ■ ■
Order codes:

10th to 14th position
Core versions

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16			Order codes
Order No.:	4	M	C	3	■	■	■	–	■	■	■	■	■	–	■	■	■	■	–	★	■ ■ ■
																	See page 49	See page 49		See page 49	

At rated primary current I_{PN}	Thermal strength	Position 12
2000 A 2500 A 3000 A 4000 A 5000 A 6000 A 8000 A 10000 A	100 x I_{PN}	0

1st core			2nd core			3rd core			4th core			Rated primary current I_{PN}			Order No. position 10 11 12 – 13 14
Class	Factor	VA rating	Class	Factor	VA rating	Class	Factor	VA rating	Class	Factor	VA rating	2000–3000 A	4000–6000 A	8000–10000 A	
0.2	FS10	15										■	■	■	C 3 – 0 A
		30										■	■	■	C 4 – 0 A
0.5	FS10	15										■	■	■	F 3 – 0 A
		30										■	■	■	F 4 – 0 A
1	FS10	30										■	■	■	J 4 – 0 A
		60										■	■	■	J 6 – 0 A
10P	10	30										■	■	■	Q 4 – 0 A
		60										■	■	■	Q 6 – 0 A
10P	20	60										■	■	■	S 6 – 0 A
		100										■	■	■	S 8 – 0 A
0.5	FS10	15	10P	10	30							■	■	■	F 3 – 4 Q
		15			60							■	■	■	F 3 – 6 Q
		15	10P	20	60							■	■	■	F 3 – 6 S
		30			60							■	■	■	F 4 – 6 S
1	FS10	60	10P	20	100							■	■	■	J 6 – 8 S
10P	10	60										■	■	■	Q 6 – 8 S
10P	20	60										■	■	■	S 6 – 8 S
		100										■	■	■	S 8 – 8 S
0.5	FS10	15	10P	10	30	10P	10	60				■	■	■	Y 0 – 0 A
1	FS10	30	10P	20	60	10P	20	100				■	■	■	Y 0 – 0 B
0.2	FS10	15	0.2	FS10	30	10P	10	30				■	■	■	Y 0 – 0 C
0.5	FS10	15			30			30				■	■	■	Y 0 – 0 D
0.2	FS10	30	1	FS10	60	10P	10	60	10P	20	100	■	■	■	Y 0 – 1 A
0.5	FS10	30			60			60			100	■	■	■	Y 0 – 1 B
1	FS10	30			60			60			100	■	■	■	Y 0 – 1 C
0.2	FS10	30	1	FS10	60	10P	10	60	10P	20	100	■	■	■	Y 0 – 1 D
0.5	FS10	30			60			60			100	■	■	■	Y 0 – 1 E
1	FS10	30			60			60			100	■	■	■	Y 0 – 1 F

■ Feasible (other combinations on request)

Configuration example
Indoor bar-primary bushing-type current transformer
(U_m = 12 kV, I_{th} = 400 kA, I_{PN} = 4000 A)
Thermal strength 100 x I_{PN}
1st core class 0.5; instrument security factor FS10; rating 15 VA
2nd core class 0.2; instrument security factor FS10; rating 30 VA
3rd core class 10P; accuracy limit factor 10; rating 30 VA

4 M C 3
2 8 7 – 1 J
0
Y 0 – 0 D

Example for Order No.: 4 M C 3 2 8 7 – 1 J Y 0 0 – 0 D ■ ■
Order codes:

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Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16			Order codes		
Order No.:	4	M	C	3	■	■	■	–	■	■	■	■	■	–	■	■	■	■	–	★	■	■	■

15th position
Rated secondary current

Rated current for 1st core	Rated current for 2nd core	Rated current for 3rd core	Rated current for 4th core	13	14	15
1 A	Without	Without	Without	0	A	A
5 A	Without	Without	Without	0	A	B
1 A	1 A	Without	Without			C
5 A	5 A	Without	Without			D
1 A	5 A	Without	Without			E
5 A	1 A	Without	Without			F
1 A	1 A	1 A	Without			G
5 A	5 A	5 A	Without			H
1 A	1 A	1 A	1 A			J
5 A	5 A	5 A	5 A			K

16th position
Additional features

Options	16
50 Hz, VDE marking	0
50 Hz, IEC marking	1
50 Hz, VDE marking with approval [1]	2
60 Hz, IEC marking	6
Further not listed special versions (only after consultation with the order processing department in the Switchgear Factory Berlin). Information additionally in clear text.	9

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[1] Only for class 0.2 and 0.5

Special versions

Options			
With routine test certificate in German/English		– Z	A 1 0
Size (for specification see the following pages)	11	– Z	A 1 1
	12	– Z	A 1 2
	21	– Z	A 2 1
	22	– Z	A 2 2
	31	– Z	A 3 1
	32	– Z	A 3 2
	41	– Z	A 4 1
	42	– Z	A 4 2
	51	– Z	A 5 1
	52	– Z	A 5 2
	61	– Z	A 6 1
	62	– Z	A 6 2
	72	– Z	A 7 2
	73	– Z	A 7 3

Other special versions on request

Configuration example

Indoor bar-primary bushing-type current transformer	4 M C 3
Maximum operating voltage U_m = 12 kV	
Rated lightning impulse withstand voltage U_p = 75 kV	
Rated short-duration power-frequency withstand voltage U_d = 28 kV	2
Rated short-time thermal current I_{th} = 400 kA	
Rated primary current I_{PN} = 4000 A	B 7 – 1 J
Thermal strength 100 x I_{PN}	0
1st core class 0.5; instrument security factor FS10; rating 15 VA	
2nd core class 0.2; instrument security factor FS10; rating 30 VA	Y 0 – 0 D
3rd core class 10P; accuracy limit factor 10; rating 30 VA	
Rated secondary current 1st core 1 A; 2nd core 1 A; 3rd core 1 A	G
Power frequency 50 Hz; marking according to IEC	1
Size 42	– Z A 4 2

Example for Order No.: 4 M C 3 2 B 7 – 1 J Y 0 0 – 0 D G 1 – Z A 4 2

Order codes: A 4 2

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Equipment Selection

4MC3 indoor bar-primary bushing-type current transformer

Size specification for 4MC32 transformers [1]

10th to 14th position of Order No.	6th to 9th position of Order No.							
	82-1F	84-1G	85-1H	87-1J	88-1K	90-1L	92-1N	93-1P
C30-0A C40-0A F30-0A F40-0A J40-0A J60-0A Q40-0A Q60-0A S60-0A	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32, 41, 42	11, 12, 21, 22, 31, 32, 41, 42, 51, 52	11, 12, 21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52, 61, 62	31, 32, 41, 42, 51, 52, 61, 62, 72, 73	41, 42, 51, 52, 61, 62, 72, 73
S80-0A	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32, 41, 42	11, 12, 21, 22, 31, 32, 41, 42, 51, 52	12, 21, 22, 31, 32, 41, 42, 51, 52	22, 31, 32, 41, 42, 51, 52, 61, 62, 72, 73	31, 32, 41, 42, 51, 52, 62, 72, 73	41, 42, 51, 52, 62, 72, 73
F30-4Q	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32, 41, 42	11, 12, 21, 22, 31, 32, 41, 42, 51, 52	11, 12, 21, 22, 31, 32, 41, 42, 51, 52	22, 31, 32, 41, 42, 51, 52, 62, 72, 73	32, 42, 51, 52, 62, 72, 73	51, 52, 62, 72, 73
F30-6Q	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32, 41, 42	11, 12, 21, 22, 31, 32, 41, 42, 51, 52	12, 21, 22, 31, 32, 41, 42, 51, 52	22, 31, 32, 41, 42, 51, 52, 62, 72, 73	32, 42, 51, 52, 62, 72, 73	42, 51, 52, 62, 72, 73
F30-6S F40-6S	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32, 41, 42	11, 12, 21, 22, 31, 32, 41, 42, 51, 52	12, 21, 22, 31, 32, 41, 42, 51, 52	22, 32, 41, 42, 51, 52, 61, 62	42, 51, 52, 62, 72, 73	42, 51, 52, 62, 72, 73
J60-8S	12, 21, 22, 31, 32	12, 21, 22, 31, 32	12, 21, 22, 31, 32, 41, 42	12, 21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52, 61, 62	31, 32, 41, 42, 51, 52, 61, 62, 72, 73	42, 52, 62, 72, 73
Q60-8S	12, 21, 22, 31, 32	12, 21, 22, 31, 32	12, 21, 22, 31, 32, 41, 42	12, 21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	21, 22, 32, 41, 42, 51, 52, 61, 62	32, 41, 42, 51, 52, 62, 72, 73	42, 52, 62, 72, 73
S60-8S	12, 21, 22, 31, 32	12, 21, 22, 31, 32	21, 22, 31, 32, 41, 42	12, 21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	21, 22, 32, 41, 42, 52, 61, 62	32, 41, 42, 51, 52, 62, 72, 73	42, 52, 62, 72, 73
S80-8S	21, 22, 32	12, 21, 22, 32	21, 22, 31, 32, 41, 42	21, 22, 32, 41, 42, 51, 52	21, 22, 32, 41, 42, 51, 52	22, 32, 41, 42, 51, 52, 62	41, 42, 51, 52, 62, 72, 73	42, 52, 62, 72, 73
Y00-0A	11, 12, 21, 22, 31, 32	11,12, 21, 22, 31, 32	12, 21, 22, 31, 32, 41, 42	12, 21, 22, 31, 32, 41, 42, 51, 52	22, 31, 32, 41, 42, 51, 52	32, 42, 51, 52, 61, 62	52, 62, 72, 73	52, 62, 72, 73
Y00-0B	21, 22, 32	21, 22, 32	22, 32, 41, 42	22, 32, 42, 51, 52	22, 32, 42, 52	22, 42, 52, 62	42, 52, 62, 72, 73	52, 62, 72, 73
Y00-0C Y00-0D	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32	12, 21, 22, 31, 32, 41, 42	12, 21, 22, 31, 32, 41, 42, 51, 52	12, 22, 32, 41, 42, 51, 52	22, 32, 42, 51, 52	52, 62, 72, 73	52, 62, 72, 73
Y00-1A Y00-1B Y00-1C	12, 22, 32	22, 32	22, 32, 42	22, 32, 42, 52	42, 52	52, 62	73	73
Y00-1D Y00-1E Y00-1F	22, 32	22, 32	22, 32, 42	41, 52	52	52, 62	73	73

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[1] Selection for transformers with rated secondary current 1 A. Sizes for 5 A on request

Size specification for 4MC34 transformers ¹⁾

10th to 14th position of Order No.	6th to 9th position of Order No.							
	82-1F	84-1G	85-1H	87-1J	88-1K	90-1L	92-1N	93-1P
C30-0A C40-0A F30-0A F40-0A J40-0A J60-0A Q40-0A Q60-0A S60-0A	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32	12, 21, 22, 31, 32, 41, 42	11, 12, 21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52, 61, 62	31, 32, 41, 42, 51, 52, 61, 62, 72, 73	41, 42, 51, 52, 61, 62, 72, 73
S80-0A	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32	12, 21, 22, 31, 32, 41, 42	11, 12, 21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	22, 31, 32, 41, 42, 51, 52, 61, 62, 72, 73	31, 32, 41, 42, 51, 52, 62, 72, 73	41, 42, 51, 52, 62, 72, 73
F30-4Q	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32, 41, 42	11, 12, 21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	22, 31, 32, 41, 42, 51, 52, 62, 72, 73	32, 42, 51, 52, 62, 72, 73	51, 52, 62, 72, 73
F30-6Q	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32, 41, 42	11, 12, 21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	22, 31, 32, 41, 42, 51, 52, 62, 72, 73	32, 42, 51, 52, 62, 72, 73	42, 51, 52, 62, 72, 73
F30-6S F40-6S	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32, 41, 42	12, 21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	22, 32, 41, 42, 51, 52, 61, 62	42, 51, 52, 62, 72, 73	42, 51, 52, 62, 72, 73
J60-8S	12, 21, 22, 31, 32	12, 21, 22, 31, 32	12, 21, 22, 31, 32, 41, 42	12, 21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52, 61, 62	31, 32, 41, 42, 51, 52, 61, 62, 72, 73	42, 52, 62, 72, 73
Q60-8S	12, 21, 22, 31, 32	12, 21, 22, 31, 32	12, 21, 22, 31, 32, 41, 42	12, 21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	22, 32, 41, 42, 51, 52, 61, 62	32, 41, 42, 51, 52, 62, 72, 73	42, 52, 62, 72, 73
S60-8S	21, 22, 31, 32	21, 22, 31, 32	21, 22, 31, 32, 41, 42	21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	22, 32, 41, 42, 52, 61, 62	42, 51, 52, 62, 72, 73	42, 52, 62, 72, 73
S80-8S	21, 22, 32	21, 22, 32	21, 22, 31, 32, 41, 42	21, 22, 32, 41, 42, 51, 52	21, 22, 32, 41, 42, 51, 52	22, 32, 41, 42, 51, 52, 62	41, 42, 51, 52, 62, 72, 73	42, 52, 62, 72, 73
Y00-0A	11, 12, 21, 22, 31, 32	11,12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32, 41, 42	11, 12, 21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	22, 32, 42, 51, 52, 61, 62	22, 32, 42, 51, 52, 61, 62, 72, 73	42, 52, 62, 72, 73
Y00-0B	22, 32	21, 22, 32	22, 32, 41, 42	22, 32, 42, 51, 52	22, 32, 42, 52	22, 42, 52, 62	42, 52, 62, 72, 73	52, 62, 72, 73
Y00-0C Y00-0D	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32, 41, 42	12, 21, 22, 31, 32, 41, 42, 51, 52	22, 32, 41, 42, 51, 52	22, 32, 42, 51, 52	52, 62, 72, 73	52, 62, 72, 73
Y00-1A Y00-1B Y00-1C	12, 22, 32	22, 32	22, 32, 42	22, 32, 42, 52	42, 52	52, 62	73	73
Y00-1D Y00-1E Y00-1F	22, 32	22, 32	22, 32, 42	41, 52	52	52, 62	73	73

1) Selection for transformers with rated secondary current 1 A. Sizes for 5 A on request

Equipment Selection

4MC3 indoor bar-primary bushing-type current transformer

Size specification for 4MC36 transformers 1)

10th to 14th position of Order No.	6th to 9th position of Order No.							
	82-1F	84-1G	85-1H	87-1J	88-1K	90-1L	92-1N	93-1P
C30-0A C40-0A F30-0A F40-0A J40-0A J60-0A Q40-0A	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32, 41, 42	11, 12, 21, 22, 31, 32, 41, 42, 51, 52	11, 12, 21, 22, 31, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52, 61, 62	31, 32, 41, 42, 51, 52, 61, 62, 72, 73	41, 42, 51, 52, 61, 62, 72, 73
Q60-0A S60-0A	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32, 41, 42, 51, 52	11, 12, 21, 22, 31, 32, 41, 42	21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52, 61, 62	31, 32, 41, 42, 51, 52, 61, 62, 72, 73	41, 42, 51, 52, 61, 62, 72, 73
S80-0A	12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32, 41, 42	21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	22, 31, 32, 41, 42, 51, 52, 61, 62	41, 42, 51, 52, 62, 72, 73	41, 42, 51, 52, 62, 72, 73
F30-4Q	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32	12, 21, 22, 31, 32, 41, 42	21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	22, 31, 32, 41, 42, 51, 52, 62	42, 52, 62, 72, 73	52, 62, 72, 73
F30-6Q	12, 21, 22, 31, 32	12, 21, 22, 31, 32	12, 21, 22, 31, 32, 41, 42	21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	22, 31, 32, 41, 42, 51, 52, 62	42, 52, 62, 72, 73	52, 62, 72, 73
F30-6S	12, 21, 22, 31, 32	12, 21, 22, 31, 32	12, 21, 22, 31, 32, 41, 42	21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	22, 32, 42, 51, 52, 61, 62	42, 52, 62, 72, 73	52, 62, 72, 73
F40-6S	12, 21, 22, 31, 32	12, 21, 22, 31, 32	21, 22, 31, 32, 41, 42	21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	21, 22, 32, 41, 42, 51, 52, 61, 62	41, 42, 51, 52, 62, 72, 73	42, 52, 62, 72, 73
J60-8S	12, 21, 22, 31, 32	12, 21, 22, 31, 32	21, 22, 31, 32, 41, 42	21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52, 61, 62	41, 42, 51, 52, 61, 62, 72, 73	42, 52, 62, 72, 73
Q60-8S	21, 22, 31, 32	12, 21, 22, 31, 32	21, 22, 32, 41, 42	21, 22, 32, 41, 42, 51, 52	22, 32, 41, 42, 51, 52	22, 32, 41, 42, 51, 52, 61, 62	42, 51, 52	42, 52, 62, 72, 73
S60-8S	21, 22, 32	21, 22, 32	21, 22, 32, 41, 42	21, 22, 32, 41, 42, 51, 52	22, 32, 41, 42, 51, 52	22, 41, 42, 51, 52, 61, 62	42, 52, 62, 72, 73	52, 62, 72, 73
S80-8S	21, 22, 32	31, 32, 42	21, 22, 32, 41, 42	21, 22, 32, 41, 42, 51, 52	22, 32, 41, 42, 51, 52	22, 32, 41, 42, 51, 52, 62	42, 52, 62, 72, 73	52, 62, 72, 73
Y00-0A	11, 12, 21, 22, 31, 32	11,12, 21, 22, 31, 32	21, 22, 31, 32, 41, 42	21, 22, 32, 41, 42, 51, 52	22, 32, 41, 42, 51, 52	22, 42, 52, 61, 62	52	52, 62, 72, 73
Y00-0B	22, 32	22, 32	22, 32	22, 42, 52	42, 52	42, 52, 62	52	73
Y00-0C Y00-0D	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32	21, 22, 31, 32, 41, 42	21, 22, 32, 41, 42, 51, 52	22, 32, 41, 42, 51, 52	22, 52, 62	73	73
Y00-1A Y00-1B Y00-1C	22, 32	22, 32	22, 32	42, 52	52	–	73	73
Y00-1D Y00-1E Y00-1F	22	22	22, 42	52	–	–	73	73

1) Selection for transformers with rated secondary current 1 A. Sizes for 5 A on request

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4ME2 outdoor support-type current transformer

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16	–		Order codes
Order No.:	4	M	E	2	■	■	■	–	■	■	■	■	■	–	■	■	■	■	–	★	■ ■ ■
											See page 55	See page 55	See page 55		See page 55	See page 55	See page 56	See page 56		See page 56	

5th position
Operating voltage (maximum value)

Operating voltage U_m kV	Rated lightning impulse withstand voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Order No.
12	75	28	4 M E 2 2
24	125	50	4 M E 2 4
36	170	70	4 M E 2 6

6th to 9th position
Rated short-time thermal current/
Rated primary current

Rated short-time thermal current I_{th} kA	Rated primary current I_{PN} A	Rated primary current, with primary multi-ratio I_{PN} A	Thermal strength 300 x I_{PN}	 200 x I_{PN}	 100 x I_{PN}	6	7	–	8	9
0.5		2x 5	■		■	0	0	–	3	A
0.6		2x 10	■		■	0	1	–	3	B
1		2x 5		■		0	3	–	3	A
1.5		2x 15	■		■	0	7	–	3	D
2.5		2x 25	■		■	1	6	–	3	F
3		2x 15		■		1	7	–	3	D
5		2x 25		■		2	5	–	3	F
5		2x 50	■		■	2	5	–	3	J
7.5		2x 75	■	■	■	3	2	–	3	L
10		2x 50		■		3	6	–	3	J
10		2x 100	■		■	3	6	–	3	M
15		2x 75		■		4	3	–	3	L
15		2x 150	■		■	4	3	–	3	P
20		2x 100		■		4	8	–	3	M
20		2x 200	■		■	4	8	–	3	Q
25		2x 250	■		■	5	4	–	3	R
30		2x 150		■		5	6	–	3	P
30		2x 300	■		■	5	6	–	3	S
40		2x 200		■		6	3	–	3	Q
40		2x 400	■		■	6	3	–	3	T
50		2x 250		■		6	7	–	3	R
50		2x 500	■		■	6	7	–	3	U
60		2x 300		■		7	0	–	3	S
60		2x 600	■		■	7	0	–	3	V

6th to 9th position continued on page 54

Configuration example
Outdoor support-type current transformer
Maximum operating voltage U_m = 24 kV
Rated lightning impulse withstand voltage U_p = 125 kV
Rated short-duration power-frequency withstand voltage U_d = 50 kV
Rated short-time thermal current I_{th} = 15 kA
Rated primary current I_{PN} = 2x 75 A

4 M E 2
4
4 3 – 3 L

Example for Order No.:	4	M	E	2	4	4	3	–	3	L	■	■	■	–	■	■	■	■				
Order codes:																						

Equipment Selection

4ME2 outdoor support-type current transformer

6th to 9th position (continued)
Rated short-time thermal current/
Rated primary current

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16	–		Order codes		
Order No.:	4	M	E	2	■	■	■	–	■	■	■	■	■	–	■	■	■	■	–	★	■	■	■
											See page 55	See page 55	See page 55		See page 55	See page 55	See page 56	See page 56		See page 56			

Rated short-time thermal current I_{th} kA	Rated primary current I_{PN} A	Rated primary current, with primary multi-ratio I_{PN} A	Thermal strength $300 \times I_{PN}$	 $200 \times I_{PN}$	 $100 \times I_{PN}$	6	7	–	8	9
0,5	5		■		■	0	0	–	0	A
0.6	10		■		■	0	1	–	0	B
1	5			■		0	3	–	0	A
1.5	15		■		■	0	7	–	0	D
2	10			■		1	3	–	0	B
2	20		■		■	1	3	–	0	E
3	15			■		1	7	–	0	D
3	30		■		■	1	7	–	0	G
4	20			■		2	2	–	0	E
4	40		■		■	2	2	–	0	H
5	50		■		■	2	5	–	0	J
6	30			■		2	6	–	0	G
6	60		■		■	2	6	–	0	K
7.5	75		■		■	3	2	–	0	L
8	40			■		3	3	–	0	H
10	50			■		3	6	–	0	J
10	100		■		■	3	6	–	0	M
12	60			■		3	8	–	0	K
15	75			■		4	3	–	0	L
15	150		■		■	4	3	–	0	P
20	100			■		4	8	–	0	M
20	200		■		■	4	8	–	0	Q
25	250		■		■	5	3	–	0	R
30	150			■		5	6	–	0	P
30	300		■		■	5	6	–	0	S
40	200			■		6	3	–	0	Q
40	400		■		■	6	3	–	0	T
50	250			■		6	7	–	0	R
50	500		■		■	6	7	–	0	U
60	300			■		7	0	–	0	S
60	600		■		■	7	0	–	0	V
80	400			■		7	3	–	0	T
80	800		■		■	7	3	–	0	X
100	500			■		7	5	–	0	U
100	1000		■		■	7	5	–	1	A
120	600			■		7	6	–	0	V
120	1200		■		■	7	6	–	1	B

Configuration example
Outdoor support-type current transformer
(U_m = 24 kV, U_p = 125 kV, U_d = 50 kV)
Rated short-time thermal current I_{th} = 100 kA
Rated primary current I_{PN} = 1000 A

	1	2	3	4	5	6	7	–	8	9
	4	M	E	2						
					4					
						7	5	–	1	A

Example for Order No.: 4 M E 2 4 7 5 – 1 A ■ ■ ■ – ■ ■ ■ ■
Order codes:

10th to 14th position
Core versions

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16	–		Order codes
Order No.:	4	M	E	2	■	■	■	–	■	■	■	■	■	–	■	■	■	■	–	★	■ ■ ■
																	See page 56	See page 56		See page 56	

At rated primary current I_{PN}	Thermal strength	10	11	12	–	13	14
0.5 0.6 1.5 2 2.5 3 4 5 6 7.5 10 15 20 25 30 40 50 60 80 100 120	100 x I_{PN}			0			
1 2 3 4 5 6 8 10 12 15 20 30 40 50 60 80 100 120	200 x I_{PN}			2			
0.5 0.6 1.5 2 2.5 3 4 5 6 7.5 10 15 20 25 30 40 50 60 80 100 120	300 x I_{PN}			3			

1st core			2nd core			3rd core			Rated primary current I_{PN}			10	11	12	–	13	14
Class	Factor	VA rating	Class	Factor	VA rating	Class	Factor	VA rating	300 x I_{PN}	200 x I_{PN}	100 x I_{PN}						
0.2	FS10	5							■	■	■	C	1		–	0	A
		10							■	■	■	C	2		–	0	A
		15							■	■	■	C	3		–	0	A
		30							■	■	■	C	4		–	0	A
0.5	FS5	10							■	■	■	E	2		–	0	A
		15							■	■	■	E	3		–	0	A
		30							■	■	■	E	4		–	0	A
1	FS5	15							■	■	■	H	3		–	0	A
		30							■	■	■	H	4		–	0	A
5P	10	15							■	■	■	L	3		–	0	A
		30							■	■	■	L	4		–	0	A
		60							■	■	■	L	6		–	0	A
10P	10	15							■	■	■	Q	3		–	0	A
		30							■	■	■	Q	4		–	0	A
		60							■	■	■	Q	6		–	0	A
0.2	FS10	10	5P	10	30				■	■	■	C	2		–	4	L
		15			30				■	■	■	C	3		–	4	L
		30			60				■	■	■	C	4		–	6	L
0.5	FS5	10	5P	10	30				■	■	■	E	2		–	4	L
		15			30				■	■	■	E	3		–	4	L
		30			30				■	■	■	E	4		–	4	L
		30			60				■	■	■	E	4		–	6	L
1	FS5	15	5P	10	30				■	■	■	H	3		–	4	L
		30			30				■	■	■	H	4		–	4	L
		30			60				■	■	■	H	4		–	6	L
1	FS5	15	10P	10	30				■	■	■	H	3		–	4	Q
		30			30				■	■	■	H	4		–	4	Q
		30			60				■	■	■	H	4		–	6	Q
0.2	FS10	15	0.5	FS5	15	5P	10	15	■	■	■	Y	0		–	0	E
		15			30			30	■	■	■	Y	0		–	0	F
0.5	FS5	15	5P	10	15	5P	10	15	■	■	■	Y	0		–	0	G
		15			30			30	■	■	■	Y	0		–	0	H

■ Feasible (other combinations on request)

Configuration example
Outdoor support-type current transformer
(U_m = 24 kV, I_{th} = 100 kA, I_{PN} = 1000 A)
Thermal strength 300 x I_{PN}
1st core class 10P; instrument security factor 10; rating 60 VA
2nd core without
3rd core without

4 M E 2
4 7 5 – 1 A
3
Q 6 – 0 A

Example for Order No.: 4 M E 2 4 7 5 – 1 A Q 6 3 – 0 A ■ ■
Order codes:

Equipment Selection

4ME2 outdoor support-type current transformer

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16			Order codes		
Order No.:	4	M	E	2	■	■	■	–	■	■	■	■	■	–	■	■	■	■	–	★	■	■	■

15th position
Rated secondary current

Rated current for 1st core	Rated current for 2nd core	Rated current for 3rd core	13	14	15
1 A	Without	Without	0	A	A
5 A	Without	Without	0	A	B
1 A	1 A	Without			C
5 A	5 A	Without			D
1 A	5 A	Without			E
5 A	1 A	Without			F
1 A	1 A	1 A			G
5 A	5 A	5 A			H

16th position
Additional features

Options	16
50 Hz, VDE marking	0
50 Hz, IEC marking	1
50 Hz, VDE marking with approval 1)	2
60 Hz, IEC marking	6
Further not listed special versions (only after consultation with the order processing department in the Switchgear Factory Berlin). Information additionally in clear text.	9

1) Only for class 0.2 and 0.5

Special versions

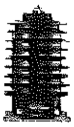
Options			Order codes
With routine test certificate in German/English		– Z	A 1 0
Size (for specification see the following page)	0	– Z	A 0 0
	1	– Z	A 0 1
	2	– Z	A 0 2
	3	– Z	A 0 3
Other special versions on request			

Configuration example

Outdoor support-type current transformer	4 M E 2
Maximum operating voltage $U_m = 24$ kV	
Rated lightning impulse withstand voltage $U_p = 125$ kV	
Rated short-duration power-frequency withstand voltage $U_d = 50$ kV	4
Rated short-time thermal current $I_{th} = 100$ kA	
Rated primary current $I_{PN} = 1000$ A	7 5 – 1 A
Thermal strength 300 x I_{PN}	3
1st core class 10P; instrument security factor 10; rating 60 VA	
2nd core without	
3rd core without	Q 6 – 0 A
Rated secondary current 1st core 5 A; 2nd core without; 3rd core without	B
Power frequency 50 Hz; marking according to IEC	1
Size 1	– Z A 0 1

Example for Order No.: 4 M E 2 4 7 5 – 1 A Q 6 3 – 0 A B 1 – Z A 0 1

Order codes: A 0 1

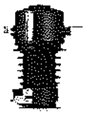


Size specification for 4ME2 transformers

Order No.	Up to 12 kV			At 24 kV		At 36 kV
	with rated short-time thermal current					
	100 x I_{PN}	200 x I_{PN}	300 x I_{PN}	100 x I_{PN}	200 x I_{PN}	100 x I_{PN}
... C1.-0A ...	1	1	1	1	1	1
... C2.-0A ...	1	1	1	1	1	1
... C3.-0A ...	1	1	1	1	1	1
... C4.-0A ...	1	1	1	1	1	1
... E2.-0A ...	1	1	1	1	1	1
... E3.-0A ...	1	1	1	1	1	1
... E4.-0A ...	1	1	1	1	1	1
... H3.-0A ...	1	1	1	1	1	1
... H4.-0A ...	1	1	1	1	1	1
... L3.-0A ...	1	1	1	1	1	1
... L4.-0A ...	1	1	2	1	1	1
... L6.-0A ...	2	2	2	1	2	1
... Q3.-0A ...	1	1	1	1	1	1
... Q4.-0A ...	1	1	2	1	1	1
... Q6.-0A ...	2	2	2	1	2	2
... C2.-4L ...	1	2	2	1	2	2
... C3.-4L ...	1	1	2	1	2	2
... C4.-6L ...	2	2	2	2	2	2
... E2.-4L ...	1	1	2	1	2	2
... E3.-4L ...	1	1	2	2	2	1
... E4.-4L ...	1	2	2	2	2	1
... E4.-6L ...	2	2	2	2	2	2
... H3.-4L ...	1	2	2	1	2	2
... H4.-4L ...	1	2	2	1	2	2
... H4.-6L ...	2	2	2	2	2	2
... H3.-4Q ...	1	2	2	1	2	2
... H4.-4Q ...	1	2	2	1	2	2
... H4.-6Q ...	2	2	2	2	2	2
... Y0.-0E ...	2	2	2	1	2	2
... Y0.-0F ...	2	2	2	2	2	2
... Y0.-0G ...	2	2	2	2	2	2
... Y0.-0H ...	2	2	2	2	2	2

Equipment Selection

4ME3 outdoor support-type current transformer



4ME3 outdoor support-type current transformer

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16	–		Order codes
Order No.:	4	M	E	3	■	■	■	–	■	■	■	■	■	–	■	■	■	■	–	★	■ ■ ■
											See page 60	See page 60	See page 60		See page 60	See page 60	See page 61	See page 61		See page 61	

5th position

Operating voltage (maximum value)

Operating voltage U_m kV	Rated lightning impulse withstand voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Order No.
12	75	28	4 M E 3 2
24	125	50	4 M E 3 4
36	170	70	4 M E 3 6
52	250	95	4 M E 3 8

6th to 9th position

Rated short-time thermal current/ Rated primary current

Rated short-time thermal current I_{th} kA	Rated primary current I_{PN} A	Rated primary current, with primary multiratio I_{PN} A	Thermal strength 300 x I_{PN}	Thermal strength 200 x I_{PN}	Thermal strength 100 x I_{PN}	Order No. positions 6 7 – 8 9
0.5		2x 5	■		■	0 0 – 3 A
0.6		2x 10	■		■	0 1 – 3 B
1		2x 5		■		0 3 – 3 A
1.5		2x 15	■		■	0 7 – 3 D
2.5		2x 25	■		■	1 6 – 3 F
3		2x 15		■		1 7 – 3 D
5		2x 25		■		2 5 – 3 F
5		2x 50	■		■	2 5 – 3 J
7.5		2x 75	■	■	■	3 2 – 3 L
10		2x 50		■		3 6 – 3 J
10		2x 100	■		■	3 6 – 3 M
15		2x 75		■		4 3 – 3 L
15		2x 150	■		■	4 3 – 3 P
20		2x 100		■		4 8 – 3 M
20		2x 200	■		■	4 8 – 3 Q
25		2x 250	■		■	5 4 – 3 R
30		2x 150		■		5 6 – 3 P
30		2x 300	■		■	5 6 – 3 S
40		2x 200		■		6 3 – 3 Q
40		2x 400	■		■	6 3 – 3 T
50		2x 250		■		6 7 – 3 R
50		2x 500	■		■	6 7 – 3 U
60		2x 300		■		7 0 – 3 S
60		2x 600	■		■	7 0 – 3 V

6th to 9th position continued on page 59

Configuration example

Outdoor support-type current transformer	4 M E 3
Maximum operating voltage U_m = 52 kV Rated lightning impulse withstand voltage U_p = 250 kV Rated short-duration power-frequency withstand voltage U_d = 95 kV	8
Rated short-time thermal current I_{th} = 25 kA Rated primary current I_{PN} = 2x 250 A	5 4 – 3 R

Example for Order No.: 4 M E 3 8 5 4 – 3 R ■ ■ ■ – ■ ■ ■ ■

Order codes:

Equipment Selection

4ME3 outdoor support-type current transformer

6th to 9th position (continued)
Rated short-time thermal current/
Rated primary current

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16	–		Order codes		
Order No.:	4	M	E	3	■	■	■	–	■	■	■	■	■	–	■	■	■	■	–	★	■	■	■
											See page 60	See page 60	See page 60		See page 60	See page 60	See page 61	See page 61		See page 61			

Rated short-time thermal current I_{th} kA	Rated primary current I_{PN} A	Rated primary current, with primary multiratio I_{PN} A	Thermal strength $300 \times I_{PN}$	Thermal strength $200 \times I_{PN}$	Thermal strength $100 \times I_{PN}$	6	7	–	8	9
0.5	5		■		■	0	0	–	0	A
0.6	10		■		■	0	1	–	0	B
1	5			■		0	3	–	0	A
1.5	15		■		■	0	7	–	0	D
2	10			■		1	3	–	0	B
2	20		■		■	1	3	–	0	E
3	15			■		1	7	–	0	D
3	30		■		■	1	7	–	0	G
4	20			■		2	2	–	0	E
4	40		■		■	2	2	–	0	H
5	50		■		■	2	5	–	0	J
6	30			■		2	6	–	0	G
6	60		■		■	2	6	–	0	K
7.5	75		■		■	3	2	–	0	L
8	40			■		3	3	–	0	H
10	50			■		3	6	–	0	J
10	100		■		■	3	6	–	0	M
12	60			■		3	8	–	0	K
15	75			■		4	3	–	0	L
15	150		■		■	4	3	–	0	P
20	100			■		4	8	–	0	M
20	200		■		■	4	8	–	0	Q
25	250		■		■	5	3	–	0	R
30	150			■		5	6	–	0	P
30	300		■		■	5	6	–	0	S
40	200			■		6	3	–	0	Q
40	400		■		■	6	3	–	0	T
50	250			■		6	7	–	0	R
50	500		■		■	6	7	–	0	U
60	300			■		7	0	–	0	S
60	600		■		■	7	0	–	0	V
80	400			■		7	3	–	0	T
80	800		■		■	7	3	–	0	X
100	500			■		7	5	–	0	U
100	1000		■		■	7	5	–	1	A
120	600			■		7	6	–	0	V
120	1200		■		■	7	6	–	1	B
150	1500				■	7	8	–	1	D
200	2000				■	8	2	–	1	F
250	2500				■	8	4	–	1	G
300	3000				■	8	5	–	1	H

Configuration example
Outdoor support-type current transformer
($U_m = 52$ kV, $U_p = 250$ kV, $U_d = 95$ kV)
Rated short-time thermal current $I_{th} = 100$ kA
Rated primary current $I_{PN} = 1000$ A

	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16					
	4	M	E	3																			
					8																		
						7	5	–	1	A													
Example for Order No.:	4	M	E	3	8	7	5	–	1	A	■	■	■	–	■	■	■	■					
Order codes:																							

2

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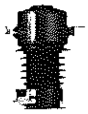
Equipment Selection

4ME3 outdoor support-type current transformer



10th to 14th position
Core versions

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16			Order codes
Order No.:	4	M	E	3	■	■	■	–	■	■	■	■	■	–	■	■	■	■	–	★	■ ■ ■
																	See page 61	See page 61		See page 61	

At rated primary current I_{PN}	Thermal strength	Position 12
0.5 0.6 1.5 2 2.5 3 4 5 6 7.5 10 15 20 25 30 40 50 60 80 100 120 150 200 250 300	100 x I_{PN}	0
1 2 3 4 5 6 8 10 12 15 20 30 40 50 60 80 100 120	200 x I_{PN}	2
0.5 0.6 1.5 2 2.5 3 4 5 6 7.5 10 15 20 25 30 40 50 60 80 100 120	300 x I_{PN}	3

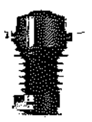
1st core			2nd core			3rd core			Rated primary current I_{PN}								
Class	Factor	VA rating	Class	Factor	VA rating	Class	Factor	VA rating	300 x I_{PN}	200 x I_{PN}	100 x I_{PN}	10	11	12	–	13	14
0.2	FS10	5							■	■	■	C	1		–	0	A
		10							■	■	■	C	2		–	0	A
		15							■	■	■	C	3		–	0	A
		30							■	■	■	C	4		–	0	A
0.5	FS5	10							■	■	■	E	2		–	0	A
		15							■	■	■	E	3		–	0	A
		30							■	■	■	E	4		–	0	A
1	FS5	15							■	■	■	H	3		–	0	A
		30							■	■	■	H	4		–	0	A
5P	10	15							■	■	■	L	3		–	0	A
		30							■	■	■	L	4		–	0	A
		60							■	■	■	L	6		–	0	A
10P	10	15							■	■	■	Q	3		–	0	A
		30							■	■	■	Q	4		–	0	A
		60							■	■	■	Q	6		–	0	A
0.2	FS10	10	5P	10	30				■	■	■	C	2		–	4	L
		15			30				■	■	■	C	3		–	4	L
		30			60				■	■	■	C	4		–	6	L
0.5	FS5	10	5P	10	30				■	■	■	E	2		–	4	L
		15			30				■	■	■	E	3		–	4	L
		30			30				■	■	■	E	4		–	4	L
		30			60				■	■	■	E	4		–	6	L
1	FS5	15	5P	10	30				■	■	■	H	3		–	4	L
		30			30				■	■	■	H	4		–	4	L
		30			60				■	■	■	H	4		–	6	L
1	FS5	15	10P	10	30				■	■	■	H	3		–	4	Q
		30			30				■	■	■	H	4		–	4	Q
		30			60				■	■	■	H	4		–	6	Q
0.2	FS10	15	0.5	FS5	15	5P	10	15	■	■	■	Y	0		–	0	E
		15			30			30	■	■	■	Y	0		–	0	F
0.5	FS5	15	5P	10	15	5P	10	15	■	■	■	Y	0		–	0	G
		15			30			30	■	■	■	Y	0		–	0	H

■ Feasible (other combinations on request)

Configuration example
Outdoor support-type current transformer
(U_m = 52 kV, I_{th} = 100 kA, I_{PN} = 1000 A)
Thermal strength 300 x I_{PN}
1st core class 10P; instrument security factor 10; rating 60 VA
2nd core without
3rd core without

4 M E 3
8 7 5 – 1 A
3
Q 6 – 0 A

Example for Order No.:	4	M	E	3	8	7	5	–	1	A	Q	6	3	–	0	A	■	■					
Order codes:																							



Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16 – Order codes
Order No.: 4 M E 3 ■ ■ ■ – ■ ■ ■ ■ ■ – ■ ■ ■ ■ – ★ ■ ■ ■

15th position
Rated secondary current

Rated current for 1st core	Rated current for 2nd core	Rated current for 3rd core	
1 A	Without	Without	0 A A
5 A	Without	Without	0 A B
1 A	1 A	Without	C
5 A	5 A	Without	D
1 A	5 A	Without	E
5 A	1 A	Without	F
1 A	1 A	1 A	G
5 A	5 A	5 A	H

16th position
Additional features

Options	
50 Hz, VDE marking	0
50 Hz, IEC marking	1
50 Hz, VDE marking with approval [1]	2
60 Hz, IEC marking	6
Further not listed special versions (only after consultation with the order processing department in the Switchgear Factory Berlin). Information additionally in clear text.	9

[1] Only for class 0.2 and 0.5

Special versions

Optionen	
With routine test certificate in German/English	– Z A 1 0
Other special versions on request	

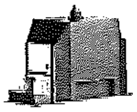
Configuration example

Outdoor support-type current transformer	4 M E 3
Maximum operating voltage U_m = 52 kV	
Rated lightning impulse withstand voltage U_p = 250 kV	
Rated short-duration power-frequency withstand voltage U_d = 95 kV	8
Rated short-time thermal current I_{th} = 100 kA	
Rated primary current I_{PN} = 1000 A	7 5 – 1 A
Thermal strength 300 x I_{PN}	3
1st core class 10P; instrument security factor 10; rating 60 VA	
2nd core without	
3rd core without	Q 6 – 0 A
Rated secondary current 1st core 5 A; 2nd core without; 3rd core without	B
Power frequency 50 Hz; marking according to IEC	1

Example for Order No.: 4 M E 3 8 7 5 – 1 A Q 6 3 – 0 A B 1
Order codes:

Voltage transformers, type of construction according to IEC 1)

Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16 Order codes
Order No.: 4 M ■ ■ ■ ■ ■ – ■ ■ ■ ■ ■ – ■ ■ ■ ■ – ★ ■ ■ ■

Illustration	Type of design	1	2	3	4	
 R-HG24-058.eps	Indoor voltage transformer, block-type design, small type of construction according to DIN 42600, single-phase cast-resin insulated, operating voltage up to 12 kV or 24 kV	4	M	R	1	Selection from page **63ff**
 R-HG24-059.eps	Indoor voltage transformer, block-type design, small type of construction according to DIN 42600, double-phase cast-resin insulated, operating voltage up to 12 kV or 24 kV	4	M	R	2	Selection from page **63ff**
 R-HG24-063.eps	Indoor voltage transformer, block-type design, large type of construction according to DIN 42600, single-phase cast-resin insulated, operating voltage up to 12 kV, 24 kV or 36 kV	4	M	R	5	Selection from page **63ff**
 R-HG24-064.eps	Indoor voltage transformer, block-type design, large type of construction according to DIN 42600, double-phase cast-resin insulated, operating voltage up to 12 kV, 24 kV or 36 kV	4	M	R	6	Selection from page **63ff**
 R-HG24-065.eps	Outdoor voltage transformer, small type of construction, single-phase cast-resin insulated, operating voltage up to 12 kV, 24 kV, 36 kV or 52 kV	4	M	S	3	Selection from page **63ff**
 R-HG24-055.eps	Outdoor voltage transformer, small type of construction, double-phase cast-resin insulated, operating voltage up to 12 kV, 24 kV, 36 kV or 52 kV	4	M	S	4	Selection from page **63ff**
 R-HG24-066.eps	Outdoor voltage transformer, large type of construction, single-phase cast-resin insulated, operating voltage up to 12 kV, 24 kV or 36 kV	4	M	S	5	Selection from page **63ff**
 R-HG24-067.eps	Outdoor voltage transformer, large type of construction, double-phase cast-resin insulated, operating voltage up to 12 kV, 24 kV or 36 kV	4	M	S	6	Selection from page **63ff**

1) Transformers according to ANSI standard on request

Example for Order No.: 4 M S 3 ■ ■ ■ – ■ ■ ■ ■ ■ – ■ ■ ■ ■
Order codes:

Maximum operating voltage U_{max} = 52 kV

12 kV

50/60 Hz

Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 Order codes

Order No.: 4 M ■ ■ ■ ■ ■ – ■ ■ ■ ■ ■ – ★ ■ ■ ■

Positions 8, 9: See page 65; positions 10, 11: See page 66; position 12: See page 67; ★: See page 67

Maximum operating voltage U_{max} kV	Rated lightning impulse withstand voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Rated primary voltage U_{prim} kV	Type 4MR1 – single-phase	Type 4MR2 – double-phase	Type 4MR5 – single-phase	Type 4MR6 – double-phase	Type 4MS3 – single-phase	Type 4MS4 – double-phase	Type 4MS5 – single-phase	Type 4MS6 – double-phase	5	6	7
12	75	28	3.3/$\sqrt{3}$	■		■						2	0	8
			3.3		■		■					2	0	8
			3.6/$\sqrt{3}$	■		■						2	7	0
			3.6		■		■					2	7	0
			4.8/$\sqrt{3}$	■		■						2	7	1
			4.8		■		■					2	7	1
			5 /$\sqrt{3}$	■		■		■		■		2	1	3
			5		■		■		■		■	2	1	3
			6 /$\sqrt{3}$	■		■		■		■		2	1	5
			6		■		■		■		■	2	1	5
			6.6/$\sqrt{3}$	■		■		■		■		2	1	7
			6.6		■		■		■		■	2	1	7
			7.2/$\sqrt{3}$	■		■						2	2	2
			7.2		■		■					2	2	2
			10 /$\sqrt{3}$	■		■		■		■		2	2	7
			10		■		■		■		■	2	2	7
			11 /$\sqrt{3}$	■		■		■		■		2	3	0
			11		■		■		■		■	2	3	0
			6–10 /$\sqrt{3}$			■						2	6	1
			6–10				■					2	6	1
			Others	■	■	■	■					2	9	9

Configuration example
Voltage transformer 4 M
Outdoor design, single-phase 5 3
Rated primary voltage U_{prim} = 6.6/$\sqrt{3}$ kV 2 1 7

Example for Order No.: 4 M 5 3 2 1 7 – ■ ■ ■ ■ ■

Order codes:

432

Equipment Selection

Voltage transformers

Position: 1 2 3 4 5 6 7 – 8 9 10 11 12

Order No.: 4 M ■ ■ ■ ■ ■ – ■ ■ ■ ■ ■ – ★

Order codes ■ ■ ■

See page 65 (position 8)
See page 65 (position 9)
See page 66 (position 10)
See page 66 (position 11)
See page 67 (position 12)
See page 67 (★)

24 kV

50/60 Hz

Maximum operating voltage U_{max} kV	Rated lightning impulse withstand voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Rated primary voltage U_{prim} kV	Type 4MR1 – single-phase	Type 4MR2 – double-phase	Type 4MR5 – single-phase	Type 4MR6 – double-phase	Type 4MS3 – single-phase	Type 4MS4 – double-phase	Type 4MS5 – single-phase	Type 4MS6 – double-phase	5	6	7
24	125	50	13.8/√3	■		■		■		■		4	3	5
			13.8		■		■		■		■	4	3	5
			15 /√3	■		■		■		■		4	3	8
			15		■		■		■		■	4	3	8
			17.5/√3	■		■		■		■		4	7	2
			17.5		■		■		■		■	4	7	2
			20 /√3	■		■		■		■		4	4	2
			20		■		■		■		■	4	4	2
			22 /√3	■		■		■		■		4	4	3
			22		■		■		■		■	4	4	3
			10–20 /√3	■		■		■		■		4	6	5
			10–20		■		■		■		■	4	6	5
			15–20 /√3	■		■						4	6	2
			15–20		■		■					4	6	2
			Others	■	■	■	■					4	9	9

36 kV

50/60 Hz

U_{max} kV	U_p kV	U_d kV	U_{prim} kV	4MR1	4MR2	4MR5	4MR6	4MS3	4MS4	4MS5	4MS6	5	6	7
36	170	70	20 /√3			■						6	4	2
			20				■					6	4	2
			22 /√3			■						6	4	3
			22				■					6	4	3
			25 /√3			■		■		■		6	4	5
			25				■		■		■	6	4	5
			30 /√3			■		■		■		6	4	6
			30				■		■		■	6	4	6
			33 /√3			■		■		■		6	4	7
			33				■		■		■	6	4	7
			35 /√3			■		■		■		6	4	8
			35				■		■		■	6	4	8
			20–30 /√3			■						6	6	4
			20–30				■					6	6	4
			Others			■	■					6	9	9

Configuration example
Voltage transformer
Outdoor design, single-phase
Rated primary voltage U_{prim} = 20/√3 kV

4 M
5 3
4 4 2

Example for Order No.: 4 M 5 3 4 4 2 – ■ ■ ■ ■ ■

Order codes:

52 kV
50/60 Hz

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12						–	★	Order codes		
Order No.:	4	M	■	■	■	■	■	–	■	■	■	■	■						–	★	■	■	■
											See page 66	See page 66	See page 67							See page 67			

Maximum operating voltage U_{max} kV	Rated lightning impulse withstand voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Rated primary voltage U_{prim} kV	Type 4MR1 – single-phase	Type 4MR2 – double-phase	Type 4MR5 – single-phase	Type 4MR6 – double-phase	Type 4MS3 – single-phase	Type 4MS4 – double-phase	Type 4MS5 – single-phase	Type 4MS6 – double-phase	5	6	7
52	250	95	$33/\sqrt{3}$					■				8	4	7
			$35/\sqrt{3}$					■				8	4	8
			$40/\sqrt{3}$					■				8	5	0
			$45/\sqrt{3}$					■				8	5	1

8th position
Auxiliary residual voltage winding

Voltage V	4MR1	4MR2	4MR5	4MR6	4MS3	4MS4	4MS5	4MS6	8
Without auxiliary winding	■	■	■	■	■	■	■	■	0
100/3	■		■		■		■		1
110/3	■		■		■		■		2
120/3	■		■		■		■		3

9th position
Rated secondary voltage

Voltage V	4MR1	4MR2	4MR5	4MR6	4MS3	4MS4	4MS5	4MS6	9
$100/\sqrt{3}$	■		■		■		■		A
100		■		■		■		■	A
$110/\sqrt{3}$	■		■		■		■		B
110		■		■		■		■	B
$120/\sqrt{3}$	■		■		■		■		C
120		■		■		■		■	C

Configuration example

Voltage transformer	4 M
Outdoor design, single-phase	S 3
Rated primary voltage with multi-ratio $U_{prim} = 35/\sqrt{3}$ kV	8 4 8 –
Without auxiliary residual voltage winding	0
Rated secondary voltage U_{sec} = 110 V	B

Example for Order No.: 4 M S 3 8 4 8 – 0 B ■ ■ ■

Order codes:

Equipment Selection

Voltage transformers

10th/11th position
Rated output of measuring winding and accuracy class

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12							–		Order codes		
Order No.:	4	M	■	■	■	■	■	–	■	■	■	■	■							–	★	■	■	■

Position 12: See page 67
Order codes: See page 67

Voltage level U_{max} kV	Class %	Rated output S_N VA	Type 4MR1 – single-phase	Type 4MR2 – double-phase	Type 4MR5 – single-phase	Type 4MR6 – double-phase	Type 4MS3 – single-phase	Type 4MS4 – double-phase	Type 4MS5 – single-phase	Type 4MS6 – double-phase	10	11
12	0.2	20	■	■							E	1
	0.2	30			■	■	■	■	■	■	G	1
	0.5	50	■	■							K	2
	0.5	90						■		■	N	2
	0.5	100			■	■	■		■		P	2
	1	100	■	■							P	3
	1	180						■		■	S	3
	1	200			■	■	■		■		T	3
24	0.2	20	■	■							E	1
	0.2	25						■		■	F	1
	0.2	30					■		■		G	1
	0.2	45			■	■					J	1
	0.5	50	■	■							K	2
	0.5	75						■		■	M	2
	0.5	100			■	■	■		■		P	2
	1	100	■	■							P	3
	1	150						■		■	R	3
	1	200			■	■	■		■		T	3
36	0.2	25					■		■		F	1
	0.2	50			■	■					K	1
	0.2	60						■		■	L	1
	0.5	75					■		■		M	2
	0.5	100			■	■					P	2
	0.5	150						■		■	R	2
	1	150					■		■		R	3
	1	200			■	■					T	3
	1	400						■		■	V	3
52	0.2	60					■		■		L	1
	0.5	180					■		■		S	2
	1	400					■		■		V	3

2

Configuration example
Voltage transformer
Outdoor design, single-phase
Rated output of measuring winding **180 VA**
Accuracy class **0.5**

4 M
S 3 8 4 8 – 0 B
S 2

Example for Order No.: 4 M S 3 8 4 8 – 0 B S 2 ■
Order codes:

12th position
Additional features

Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 | Order codes
Order No.: 4 M ■ ■ ■ ■ ■ – ■ ■ ■ ■ ■ – ★ ■ ■ ■

Options	4MR1	4MR2	4MR5	4MR6	4MS3	4MS4	4MS5	4MS6	12
50 Hz, VDE marking	■	■	■	■	■	■	■	■	0
50 Hz, IEC marking	■	■	■	■	■	■	■	■	1
50 Hz, VDE marking with approval [1]	■	■	■	■	■	■	■	■	2
60 Hz, IEC marking	■	■	■	■	■	■	■	■	6
Other features on request	■	■	■	■	■	■	■	■	9

1) Only for class 0.2 and 0.5

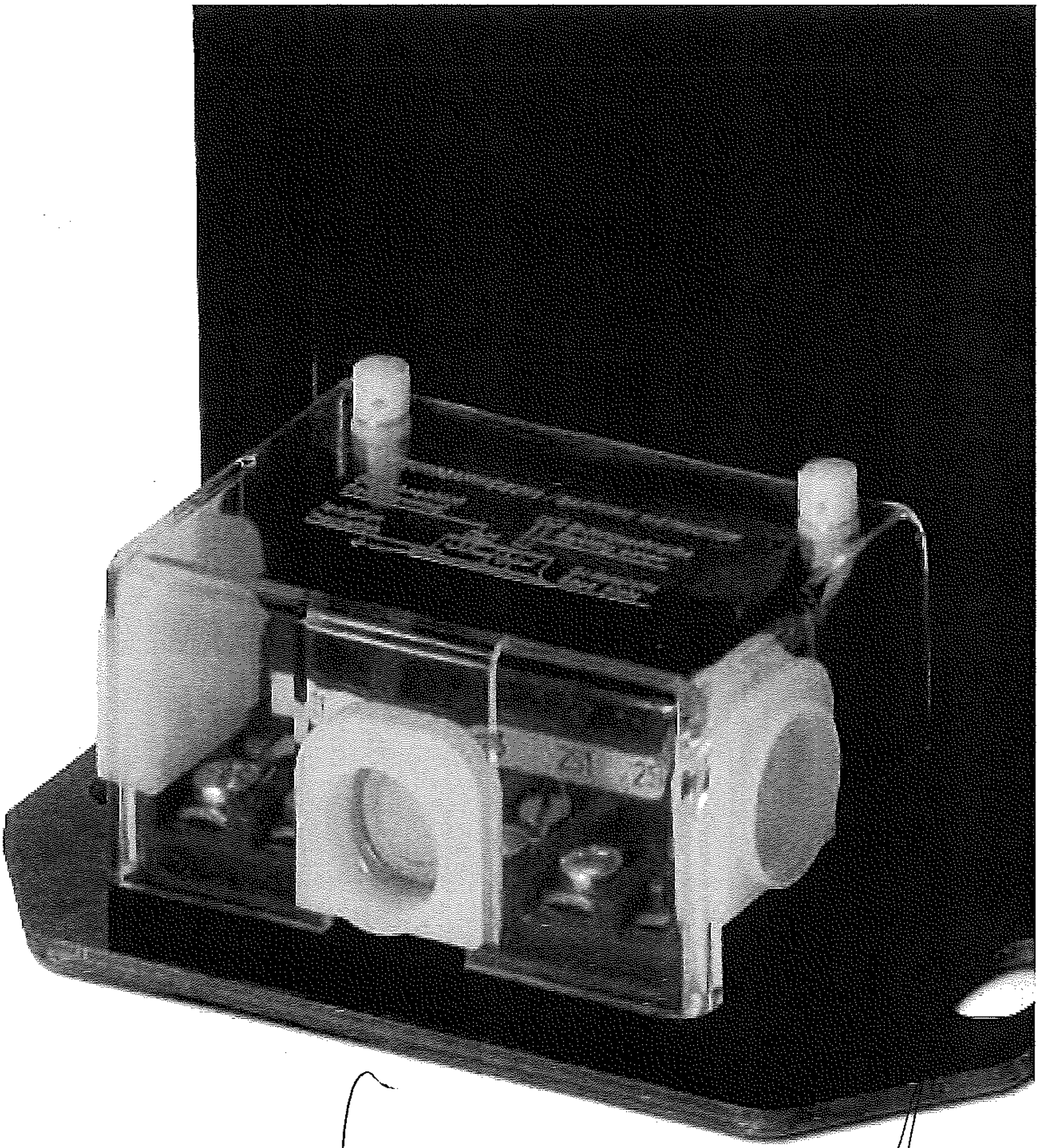
Additional equipment

Options	Type 4MR1 – single-phase	Type 4MR2 – double-phase	Type 4MR5 – single-phase	Type 4MR6 – double-phase	Type 4MS3 – single-phase	Type 4MS4 – double-phase	Type 4MS5 – single-phase	Type 4MS6 – double-phase	Order codes
With routine test certificate in German/English	■	■	■	■	■	■	■	■	– Z A 1 0

Configuration example
Voltage transformer
Outdoor design, single-phase, cast-resin insulated
Rated primary voltage with multi-ratio $U_{prim} = 35/\sqrt{3}$ kV
Without auxiliary residual voltage winding
Rated secondary voltage U_{sec} = **110 V**
Rated output of measuring winding **180 VA**
Accuracy class **0.5**
Additional features **50 Hz, IEC marking**
With routine test certificate in German/English

4 M
S 3
8 4 8 –
0
B
S 2
1
– Z
A 1 0

Example for Order No.: 4 M S 3 8 4 8 – 0 B S 2 1 – Z
Order codes: A 1 0



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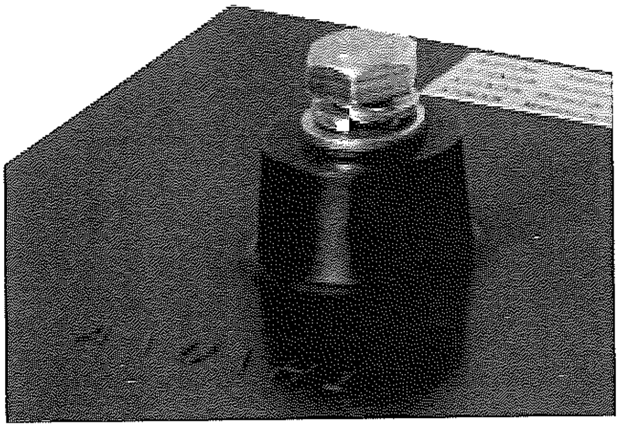

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Primary connection terminal of 4MR12 voltage transformer

408

Technical Data

Electrical data, dimensions and weights of current transformers

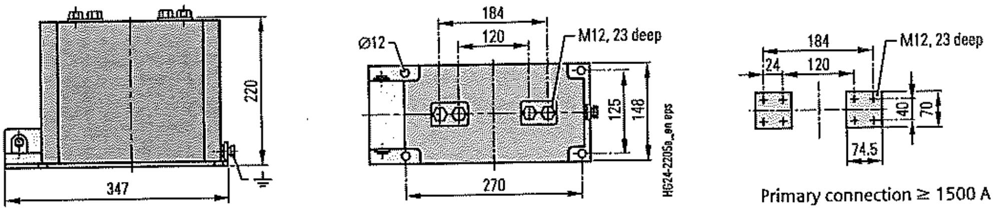
Order No.	Operating voltage (maximum value) U_m kV	Rated short-duration power-frequency withstand voltage U_d kV	Rated lightning impulse withstand voltage U_p kV	Rated frequency Hz	Rated primary current I_{PN} A	Multi-ratio	Secondary current I_{SN} kA	Maximum rated continuous thermal current x I_{PN}	Rated short-time thermal current (minimum 100 x I_{PN}) I_{th} kA	Rated dynamic current (I_{dyn} 2.5 x I_{th}) I_{dyn} kA	Number of cores maximum	Short-time load (mechanical) N	Weight kg	Catalog dimension drawing
4MA72	12	28	75	50/60	20 to 2500	2 x 20 to 2 x 600	1/5	1.2	80	120	–	5000	20	1
4MA72...Z F18	17.5	38	95	50/60	20 to 2500	2 x 20 to 2 x 600	1/5	1.2	80	120	–	5000	20	1
4MA74	24	50	125	50/60	20 to 2500	2 x 20 to 2 x 600	1/5	1.2	80	120	–	5000	25	2
4MA76	36	70	170	50/60	20 to 2000	2 x 20 to 2 x 600	1/5	1.2	80	120	–	5000	35	3
4MB12	12	28	75	50/60	1500 to 4000	only possible on secondary side	1/5	1.2	100 x I_{PN}	practically unlimited	3	3000	19 or 26	4
4MB13	12	28	75	50/60	1500 to 6000	only possible on secondary side	1/5	1.2	100 x I_{PN}	practically unlimited	3	3000	34	4
4MB14	24[1]	50[1]	125[1]	50/60	1500 to 4000	only possible on secondary side	1/5	1.2	100 x I_{PN}	practically unlimited	3	3000	26	4
4MC22	12	28	75	50/60	150 to 3000	only possible on secondary side	1/5	1.2	100 x I_{PN}	practically unlimited	3	5000	12 to 48	5
4MC24	24	50	125	50/60	150 to 3000	only possible on secondary side	1/5	1.2	100 x I_{PN}	practically unlimited	3	5000	28 to 48	5
4MC26	36	70	170	50/60	150 to 3000	only possible on secondary side	1/5	1.2	100 x I_{PN}	practically unlimited	3	5000	35 to 48	5
4MC32	12	28	75	50/60	2000 to 10000	only possible on secondary side	1/5	1.2	100 x I_{PN}	practically unlimited	4	5000	32 to 150	6
4MC34	24	50	125	50/60	2000 to 10000	only possible on secondary side	1/5	1.2	100 x I_{PN}	practically unlimited	4	5000	32 to 150	7
4MC36	36	70	170	50/60	2000 to 10000	only possible on secondary side	1/5	1.2	100 x I_{PN}	practically unlimited	4	5000	32 to 150	8
4ME22	12	28	75	50/60	5 to 1200	2 x 5 to 2 x 600	1/5	1.2	80	2.5 x I_{th}	3	2400	22	9/10
4ME24	24	50	125	50/60	5 to 1200	2 x 5 to 2 x 600	1/5	1.2	80	2.5 x I_{th}	3	2400	22	9/10
4ME26	36	70	170	50/60	5 to 1200	2 x 5 to 2 x 600	1/5	1.2	80	2.5 x I_{th}	3	2000	22	11/12
4ME32	12	28	75	50/60	5 to 3000	2 x 5 to 2 x 600	1/5	1.2	80	2.5 x I_{th}	3	5000	65	13
4ME34	24	50	125	50/60	5 to 3000	2 x 5 to 2 x 600	1/5	1.2	80	2.5 x I_{th}	3	5000	65	13
4ME36	36	70	170	50/60	5 to 3000	2 x 5 to 2 x 600	1/5	1.2	80	2.5 x I_{th}	3	5000	65	14
4ME38	52	95	250	50/60	5 to 3000	2 x 5 to 2 x 600	1/5	1.2	80	2.5 x I_{th}	3	5000	65	15

1) Also possible on request: $U_m = 17.5$, $U_d = 38$ kV and $U_p = 75$ kV

Size specification for 4MC2 transformers

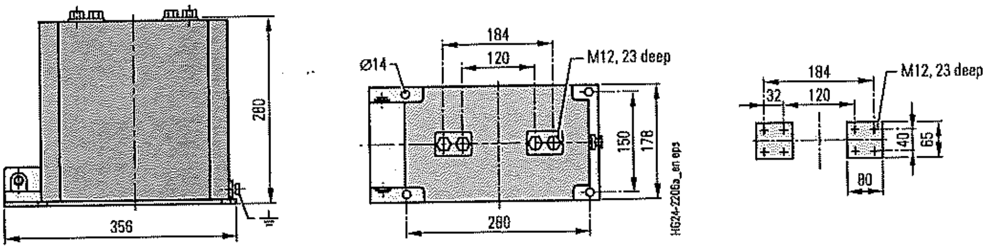
10th to 14th position of Order No.	6th to 9th position of Order No.												
	43-0P	48-0Q	56-0S	63-0T	67-0U	70-0V	73-0X	75-1A	76-1B	78-1D	82-1F	84-1G	86-1H
	Sizes of 4MC22 transformers												
C20-0A	1	0	0	0	0	0	0	0	0	0	0	0	21
C30-0A	2	0	0	0	0	0	0	0	0	0	0	0	21
E30-0A	1	0	0	0	0	0	0	0	0	0	0	0	21
E40-0A	2	0	0	0	0	0	0	0	0	0	0	0	21
H30-0A	0	0	0	0	0	0	0	0	0	0	0	0	21
H40-0A	1	2	2	2	2	2	2	2	2	2	2	2	21
Q30-0A	2	1	0	0	0	0	0	0	0	0	0	0	21
Q40-0A	2	1	1	1	0	0	0	0	0	0	0	0	21
Q60-0A	21	3	2	1	1	0	0	0	1	1	1	1	21
C20-4Q	3	2	1	0	0	0	0	0	0	0	0	0	21
C30-4Q	3	2	1	1	0	0	0	0	0	0	0	0	21
E30-3Q	3	2	1	0	0	0	0	0	0	0	0	0	21
E30-4Q	3	2	1	0	0	0	0	0	0	0	0	0	21
E40-4Q	3	2	1	0	0	0	0	0	0	0	0	0	21
E40-6Q	–	21	3	2	2	1	1	1	1	2	2	2	21
H30-3Q	1	1	0	0	0	0	0	0	0	0	0	0	21
H30-4Q	2	2	1	0	0	0	0	0	0	0	0	0	21
H40-4Q	2	2	1	0	0	0	0	0	0	0	0	0	21
H40-6Q	–	21	2	2	1	1	1	1	1	2	2	2	21
	Sizes of 4MC24 transformers												
C20-0A	1	1	1	1	1	1	1	1	1	1	1	11	11
C30-0A	1	1	1	1	1	1	1	1	1	1	1	11	11
E30-0A	1	1	1	1	1	1	1	1	1	1	1	11	11
E40-0A	1	1	1	1	1	1	1	1	1	1	1	11	11
H30-0A	1	1	1	1	1	1	1	1	1	1	1	11	11
H40-0A	1	1	1	1	1	1	1	1	1	1	1	11	11
Q30-0A	1	1	1	1	1	1	1	1	1	1	1	11	11
Q40-0A	1	1	1	1	1	1	1	1	1	1	1	11	11
Q60-0A	11	2	1	1	1	1	1	1	1	1	1	11	11
C20-4Q	2	1	1	1	1	1	1	1	1	1	1	11	11
C30-4Q	2	1	1	1	1	1	1	1	1	1	1	11	11
E30-3Q	2	2	1	1	1	1	1	1	1	1	1	11	11
E30-4Q	2	2	1	1	1	1	1	1	1	1	1	11	11
E40-4Q	2	2	1	1	1	1	1	1	1	1	1	11	11
E40-6Q	–	11	2	1	1	1	1	1	1	1	1	11	11
H30-3Q	1	1	1	1	1	1	1	1	1	1	1	11	11
H30-4Q	1	1	1	1	1	1	1	1	1	1	1	11	11
H40-4Q	2	1	1	1	1	1	1	1	1	1	1	11	11
H40-6Q	–	11	2	1	1	1	1	1	1	1	1	11	11
	Sizes of 4MC26 transformers												
C20-0A	1	1	1	1	1	1	1	1	1	1	01	01	01
C30-0A	1	1	1	1	1	1	1	1	1	1	01	01	01
E30-0A	1	1	1	1	1	1	1	1	1	1	01	01	01
E40-0A	1	1	1	1	1	1	1	1	1	1	01	01	01
H30-0A	1	1	1	1	1	1	1	1	1	1	01	01	01
H40-0A	1	1	1	1	1	1	1	1	1	1	01	01	01
Q30-0A	1	1	1	1	1	1	1	1	1	1	01	01	01
Q40-0A	1	1	1	1	1	1	1	1	1	1	01	01	01
Q60-0A	–	01	1	1	1	1	1	1	1	1	01	01	01
C20-4Q	01	1	1	1	1	1	1	1	1	1	01	01	01
C30-4Q	01	1	1	1	1	1	1	1	1	1	01	01	01
E30-3Q	01	1	1	1	1	1	1	1	1	1	01	01	01
E30-4Q	01	1	1	1	1	1	1	1	1	1	01	01	01
E40-4Q	01	1	1	1	1	1	1	1	1	1	01	01	01
E40-6Q	–	–	1	1	1	1	1	1	1	1	01	01	01
H30-3Q	1	1	1	1	1	1	1	1	1	1	01	01	01
H30-4Q	1	1	1	1	1	1	1	1	1	1	01	01	01
H40-4Q	01	1	1	1	1	1	1	1	1	1	01	01	01
H40-6Q	–	–	1	1	1	1	1	1	1	1	01	01	01

Dimension drawings for current transformers

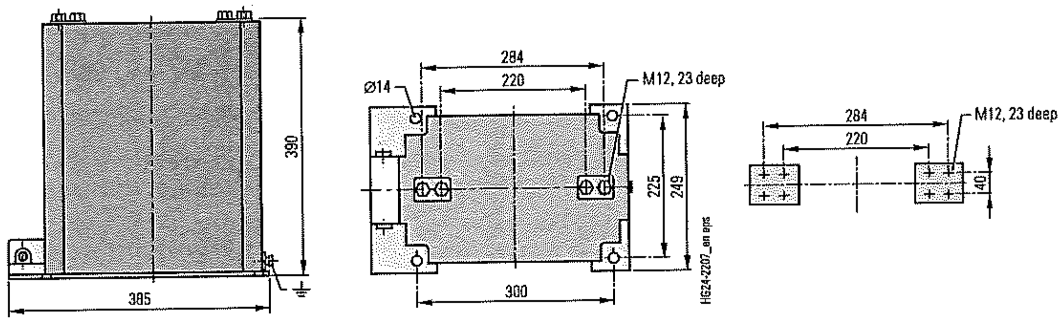


Primary connection ≥ 1500 A

Dimension drawing 1



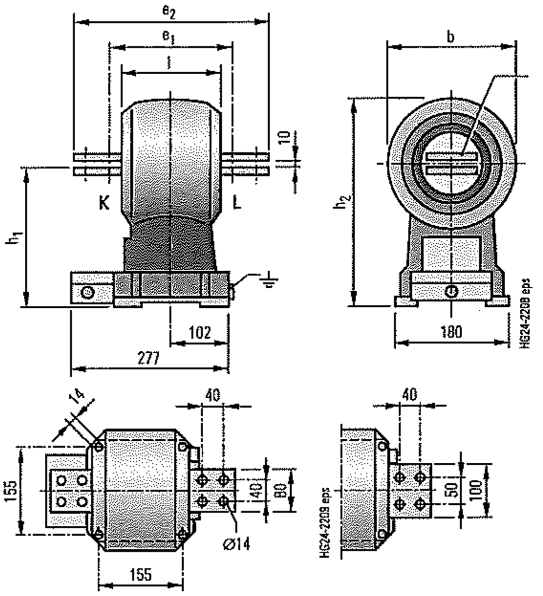
Dimension drawing 2



Dimension drawing 3

Technical Data

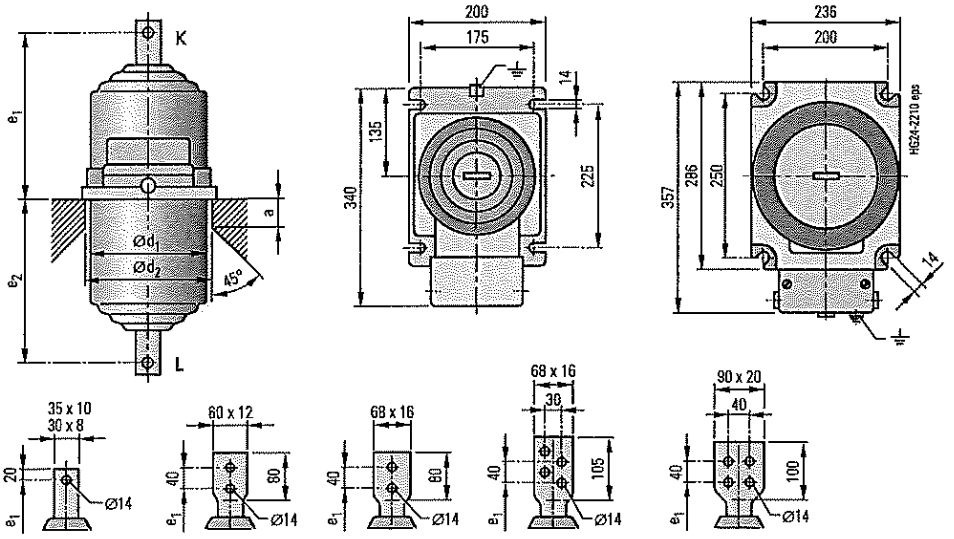
Electrical data, dimensions and weights of current transformers



Type	b	e_1	e_2	h_1	h_2	l
4MB12, size 1	214	210	350	235	342	176
4MB12, size 2	260	230	350	295	425	196
4MB13	273	–	–	288	425	300
4MB14	260	230	350	295	425	196

Current ratings	Bars
Up to 1500 A	2 x 50 x 10
1500 A to 2500 A	2 x 80 x 10
2500 A to 3000 A	2 x 80 x 10 or 3 x 80 x 10
3000 A to 4000 A	3 x 80 x 10 or 3 x 100 x 10

Dimension drawing 4



Dimension drawing 5

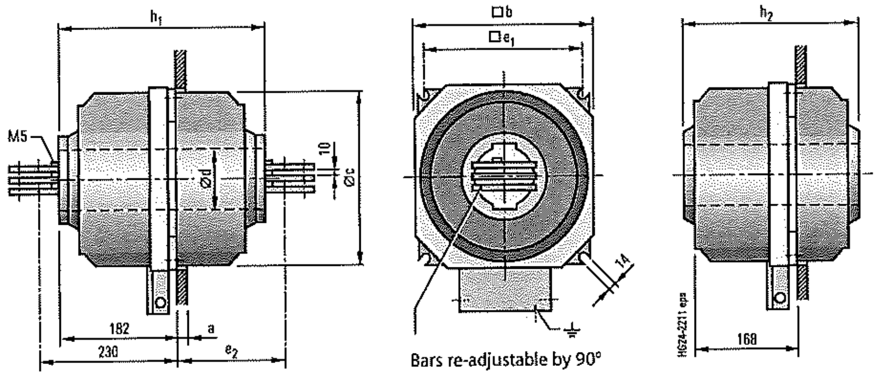
Type	Size	a	d_1	d_2	e_1			e_2			Weight
		max. mm	mm	mm	up to 1500 A mm	2000 A mm	up to 3000 A[1)] mm	up to 1500 A mm	2000 A mm	up to 3000 A[1)] mm	approx. kg
4MC22	0	50	180	185	190	195	215	150	155	175	12 to 18
	1	60	180	185	190	195	215	210	215	235	16 to 22
	2	115	180	185	255	260	280	270	275	295	28 to 32
	3	195	180	185	315	320	340	330	335	355	35 to 40
	21	150	230	235	280	285	315	290	295	325	40 to 48
4MC24	1	60	180	185	255	260	280	270	275	295	28 to 32
	2	140	180	185	315	320	340	330	335	355	35 to 40
	11	100	230	235	280	285	315	290	295	325	40 to 48
4MC26	1	60	180	185	315	320	340	330	335	355	35 to 40
	01	50	230	253	280	285	315	290	295	325	40 to 48

1) Design for rated primary current 3000 A only available in size 21, 11 or 01

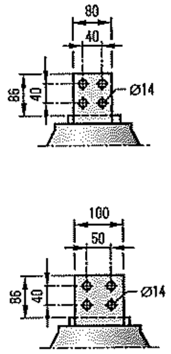
3

Technical Data

Electrical data, dimensions and weights of current transformers



Bars re-adjustable by 90°



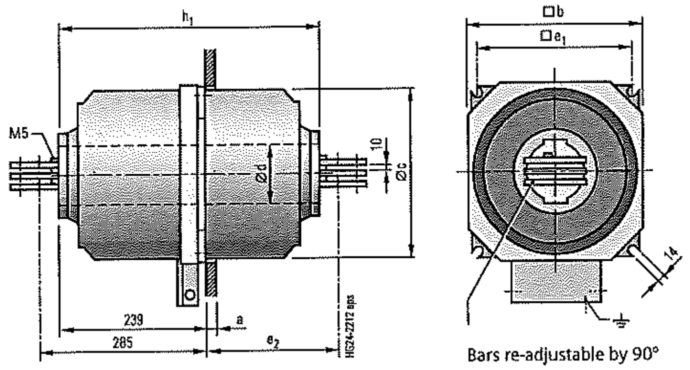
Dimension drawing 6

Size	a_{max}	b	Øc	Ød	e_1	e_2	h_1	h_2
11	10	295	278	115	255	175	313	285
12	60	295	278	115	255	250	288	360
21	10	370	356	115	325	175	313	285
22	60	370	356	115	325	250	288	360
31	10	370	356	155	325	–	–	285
32	60	370	356	155	325	–	–	360
41	10	440	440	205	490	–	–	285
42	60	440	440	205	490	–	–	360
51	10	530	530	297	490	–	–	285
52	60	530	530	297	490	–	–	360
61	10	530	530	310	490	–	–	–
62	60	530	530	310	490	–	–	–
72	10	650	650	380	600	–	–	–
73	60	650	650	380	600	–	–	–

Conductor bars

Normal designs

2000 A:	2 bars, 80 x 10 mm
2500 A:	2 bars, 100 x 10 mm
3000 A:	3 bars, 80 x 10 mm
4000 A:	3 bars, 100 x 10 mm

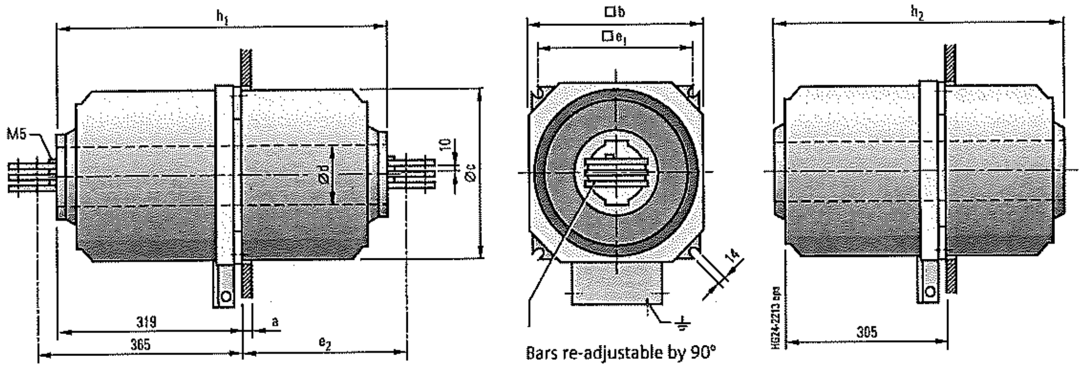


Bars re-adjustable by 90°

Dimension drawing 7

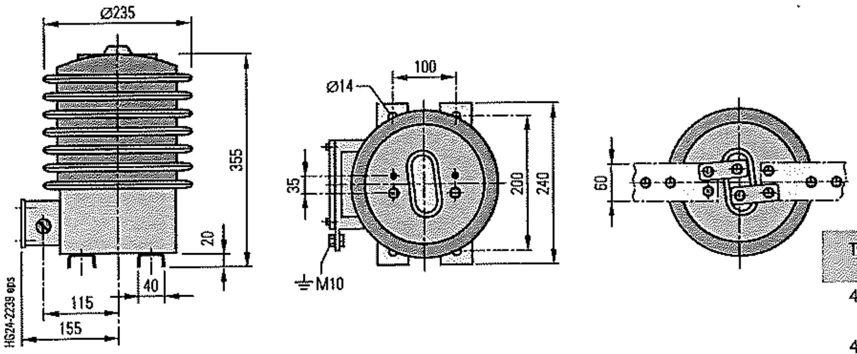
Size	a_{max}	b	Øc	Ød	e_1	e_2	h_1	h_2
11	10	295	278	115	255	230	427	399
12	60	295	278	115	255	305	502	474
21	10	370	356	115	325	230	427	399
22	60	370	356	115	325	305	50	474
31	10	370	356	155	325	–	–	399
32	60	370	356	155	325	–	–	474
41	10	440	440	205	490	–	–	399
42	60	440	440	205	490	–	–	474
51	10	530	530	297	490	–	–	399
52	60	530	530	297	490	–	–	474
61	10	530	530	310	490	–	–	399
62	60	530	530	310	490	–	–	474
72	10	650	650	380	600	–	–	–
73	60	650	650	380	600	–	–	–

443



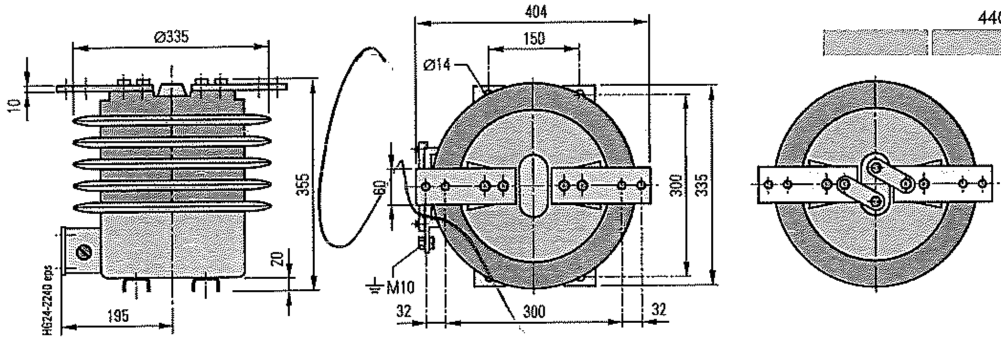
Dimension drawing 8

Size	a_{max}	b	Øc	Ød	e_1	e_2	h_1	h_2
11	10	295	278	115	255	175	313	285
12	60	295	278	115	255	250	288	360
21	10	370	356	115	325	175	313	285
22	60	370	356	115	325	250	288	360
31	10	370	356	155	325	–	–	285
32	60	370	356	155	325	–	–	360
41	10	440	440	205	490	–	–	285
42	60	440	440	205	490	–	–	360
51	10	530	530	297	490	–	–	285
52	60	530	530	297	490	–	–	360
61	10	530	530	310	490	–	–	–
62	60	530	530	310	490	–	–	–
72	10	650	650	380	600	–	–	–
73	60	650	650	380	600	–	–	–



Dimension drawing 9

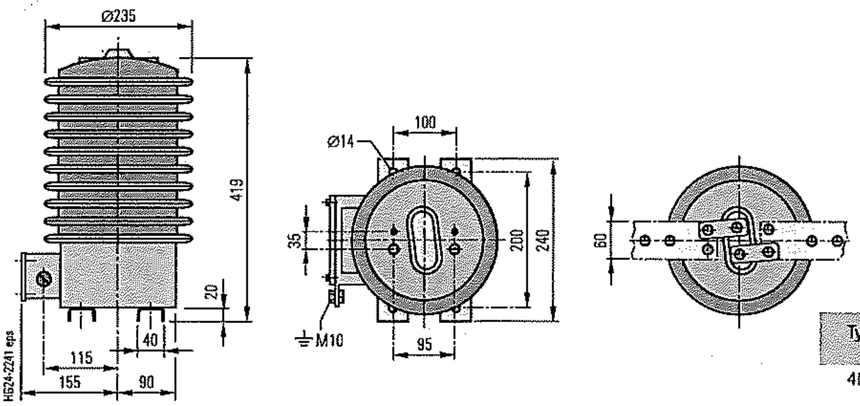
Type	Arcing distance	Creepage distance
4ME22	229	486
	310	400
4ME24	229	486
	440	1010
4ME26	405	945
	440	1010



Dimension drawing 10

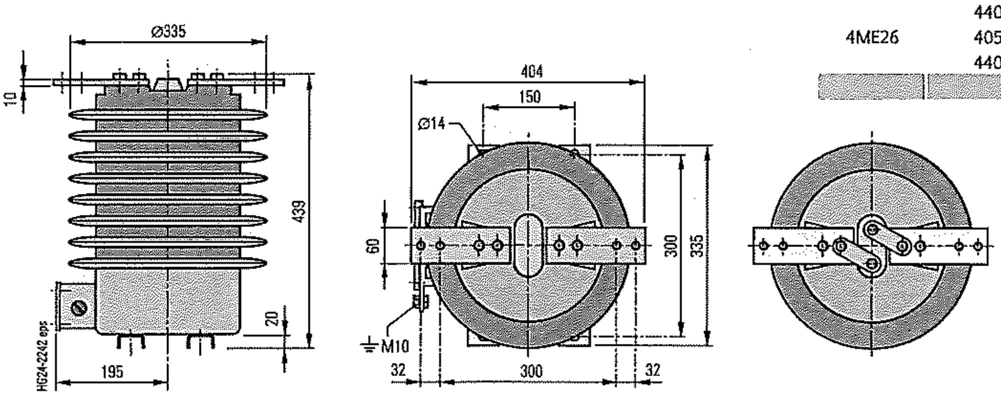
Technical Data

Electrical data, dimensions and weights of current transformers

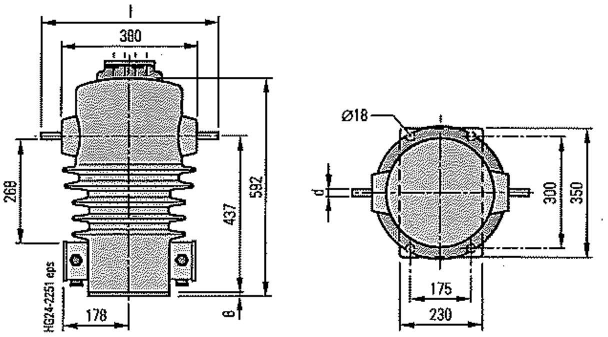


Dimension drawing 11

Type	Arcing distance	Creepage distance
4ME22	229	486
	310	400
4ME24	229	486
	440	1010
4ME26	405	945
	440	1010

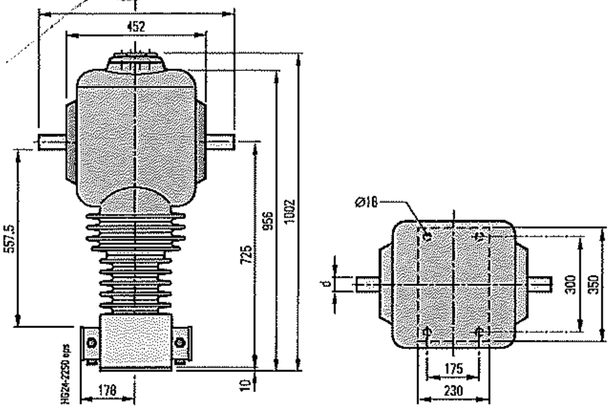


Dimension drawing 12



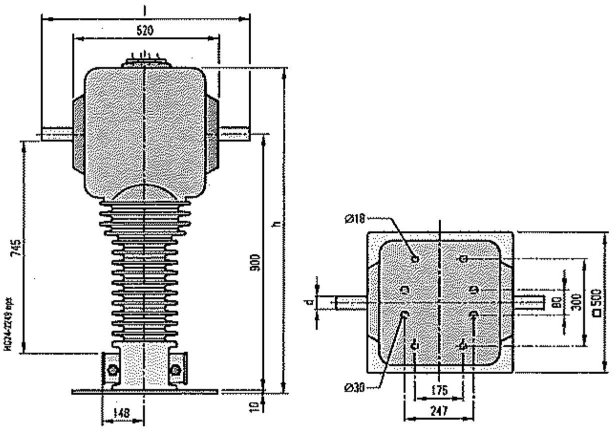
Dimension drawing 13

I_{PN}	d	l	Arcing distance	Creepage distance
Up to 600 A	20	500	268	665
600 to 1250 A	30	560	268	665
1250 to 2000 A	42	600	268	665
2000 to 3000 A	48	620	268	665



Dimension drawing 14

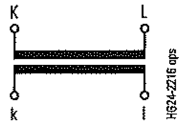
I_{PN}	d	l	Arcing distance	Creepage distance
Up to 600 A	20	572	557.5	1290
600 to 1250 A	30	632	557.5	1290
1250 to 2000 A	42	672	557.5	1290
2000 to 3000 A	48	692	557.5	1290



Dimension drawing 15

I_{PN}	d	l	h	Arcing distance	Creepage distance
500 A	30	700	1125	745	1823
Up to 1250 A	30	700	1188	745	1823
1250 to 2000 A	42	740	1188	745	1823
2000 to 3000 A	45	760	1188	745	1823
2x 600 A	30	700	1217	745	1823

Terminal designations of current transformers

<table>
<tr><th rowspan="2">Transformer design</th><th colspan="2">Designation of connection terminals</th><th rowspan="2">Example for rated current data</th></tr>
<tr><th>acc. to VDE</th><th>acc. to IEC</th></tr>
<tr><td>1 primary winding
1 secondary winding</td><td>


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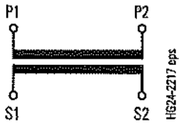
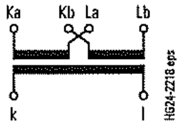
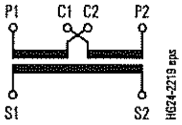
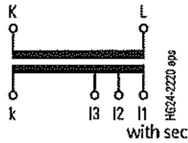
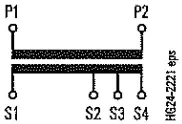
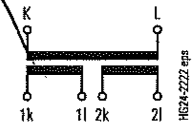


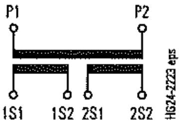
</td><td>100/1 A</td></tr>
<tr><td>2 equivalent primary windings
1 secondary winding</td><td>


</td><td>


</td><td>2 x 100/1 A</td></tr>
<tr><td></td><td colspan="2">with primary multi-ratio</td><td></td></tr>
<tr><td>1 primary winding
1 secondary winding with tappings</td><td>


</td><td>


</td><td>1000–800 ... 200/1A</td></tr>
<tr><td></td><td colspan="2">with secondary multi-ratio, highest rated current at l1 or S4</td><td></td></tr>
<tr><td>1 primary winding
2 or more secondary windings on separate cores</td><td>


</td><td>


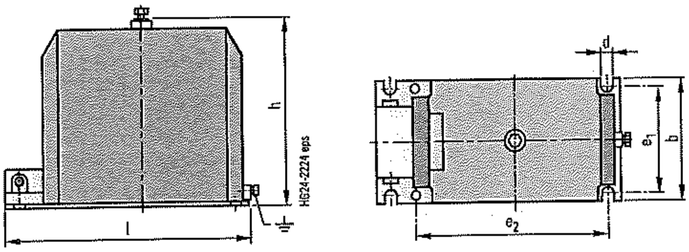
</td><td>100/1/1 A</td></tr>
</table>

Technical Data

Electrical data, dimensions and weights of voltage transformers

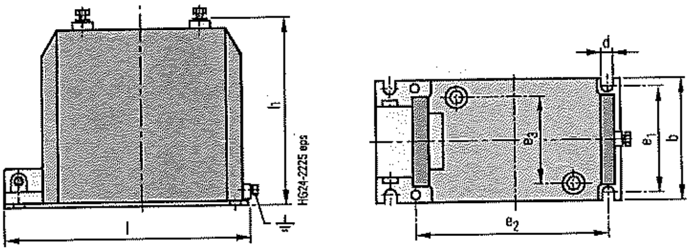
Order No.	Operating voltage (maximum value) U_m kV	Rated short-duration power-frequency withstand voltage U_d kV	Rated lightning impulse withstand voltage U_P kV	Rated frequency Hz	Maximum rated primary voltage U_{PN} kV	Multi-ratio U_{SN} kV	Thermal limiting output S_{th} VA	Rated voltage factor (8h)	Rated thermal limiting output of the residual voltage winding VA/A	Short-time load (mechanical) N	Weight kg	Catalog dimension drawing
4MR12	12	28	75	50/60	11.5/√3	100/√3; 110/√3; 120/√3	350	1.9	230/4	–	18	16
4MR14	24	50	125	50/60	22/√3	100/√3; 110/√3; 120/√3	500	1.9	230/4	–	28	16
4MR22	12	28	75	50/60	11.5	100; 110; 120	400	–	–	–	18	17
4MR24	24	50	125	50/60	22	100; 110; 120	400	–	–	–	30	17
4MR52	12	28	75	50/60	11.5/√3	100/√3; 110/√3; 120/√3	600	1.9	350/6	–	25	18
4MR54	24	50	125	50/60	22/√3	100/√3; 110/√3; 120/√3	600	1.9	350/6	–	35	18
4MR56	36	70	170	50/60	35/√3	100/√3; 110/√3; 120/√3	800	1.9	350/6	–	60	18
4MR62	12	28	75	50/60	11.5	100; 110; 120	600	–	–	–	25	19
4MR64	24	50	125	50/60	22	100; 110; 120	600	–	–	–	35	19
4MR66	36	70	170	50/60	35	100; 110; 120	800	–	–	–	70	19
4MS32	12	28	75	50/60	12/√3	100/√3; 110/√3; 120/√3	400	1.9	230/4	1000	72	20
4MS34	24	50	125	50/60	22/√3	100/√3; 110/√3; 120/√3	400	1.9	230/4	1000	75	20
4MS36	12	28	75	50/60	35/√3	100/√3; 110/√3; 120/√3	400	1.9	230/4	1000	79	20
4MS38	52	70	250	50/60	50/√3	100/√3; 110/√3; 120/√3	800	1.9	500/9	1000	79	20
4MS42	12	28	75	50/60	12	100; 110; 120	500	–	–	1000	73	21
4MS44	24	50	125	50/60	22	100; 110; 120	500	–	–	1000	76	21
4MS46	12	28	75	50/60	35	100; 110; 120	900	–	–	1000	82	21
4MS52	12	28	75	50/60	12/√3	100/√3; 110/√3; 120/√3	400	1.9	230/4	1000	35.5	22
4MS54	24	50	125	50/60	22/√3	100/√3; 110/√3; 120/√3	400	1.9	230/4	1000	35.5	22
4MS56	36	28	75	50/60	35/√3	100/√3; 110/√3; 120/√3	400	1.9	230/4	1000	51	23
4MS62	12	28	75	50/60	12	100; 110; 120	500	–	–	1000	37	24
4MS64	24	50	125	50/60	22	100; 110; 120	500	–	–	1000	37	24
4MS66	36	28	75	50/60	35	100; 110; 120	500	–	–	1000	57	25

Dimension drawings for voltage transformers



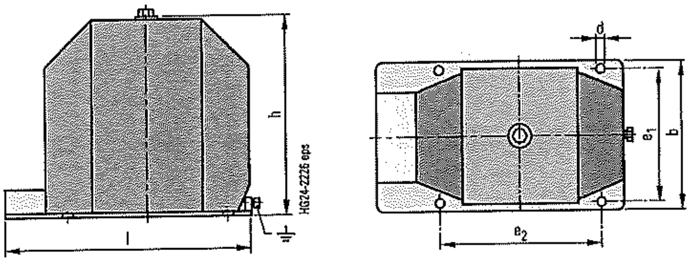
Dimension drawing 16

Type	b	h	l	e_1	e_2	d
4MR12	148	220	335	125	270	11
4MR14	178	280	357	150	280	14



Dimension drawing 17

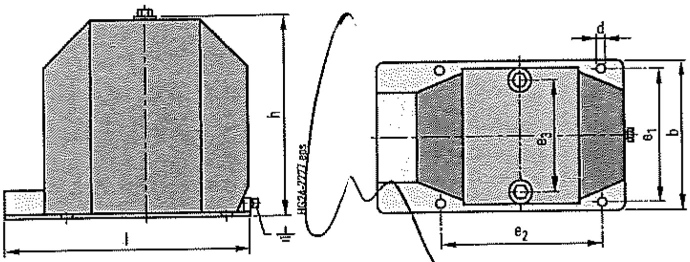
Type	b	h	l	e_1	e_2	e_3	d
4MR12	148	220	335	125	270	110	11
4MR14	178	280	357	150	280	130	14



Dimension drawing 18

Type	b	h	l	e_1	e_2	d
4MR52	200	240	342	175	225	11
4MR54	225	300	370	200	250	14
4MR54 1)	200	300	324	175	225	14
4MR56	249	390	395	225	300	14

1) Design on request



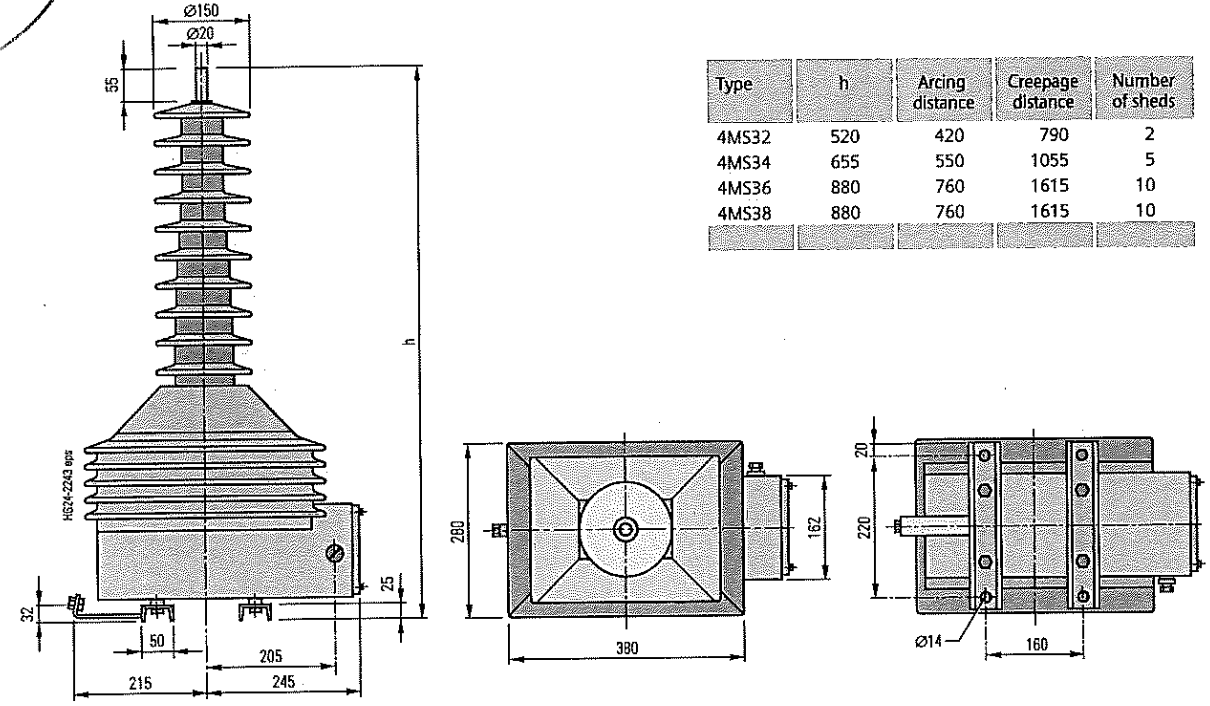
Dimension drawing 19

Type	b	h	l	e_1	e_2	e_3	d
4MR62	200	240	342	175	225	150	11
4MR64	225	300	370	200	250	210	14
4MR64 1)	200	260	324	175	225	155	14
4MR66	249	390	395	225	300	320	14

1) Design on request

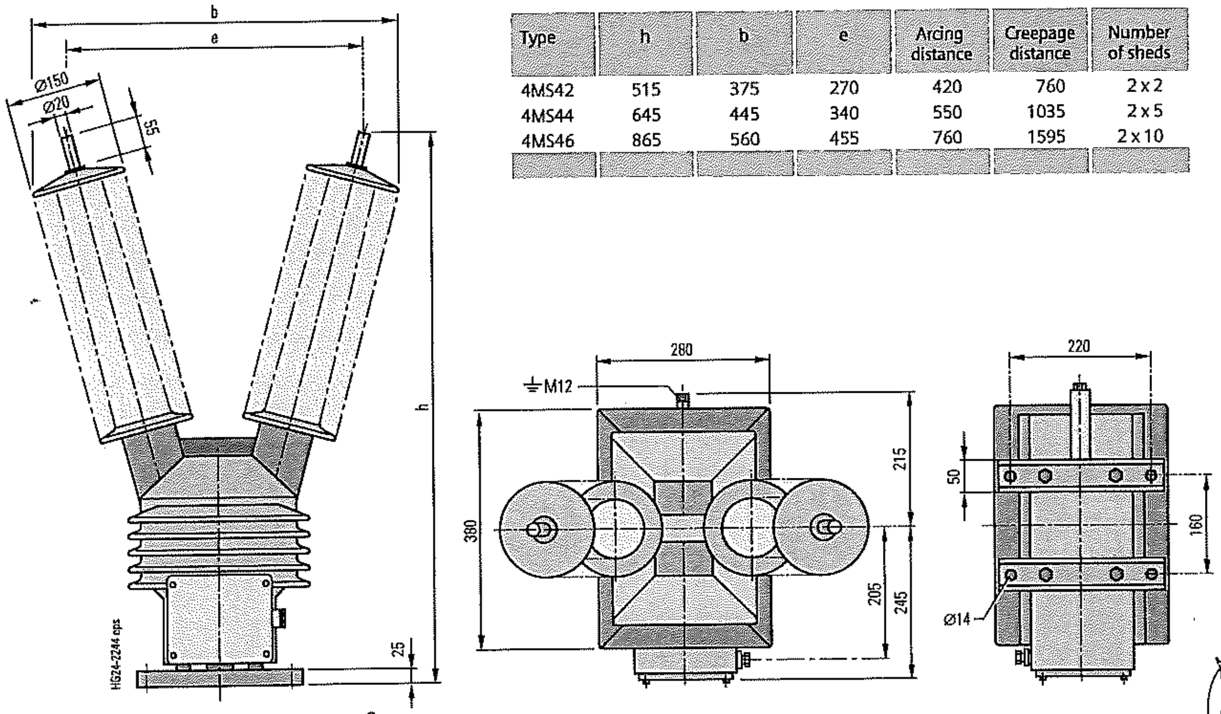
Technical Data

Electrical data, dimensions and weights of voltage transformers



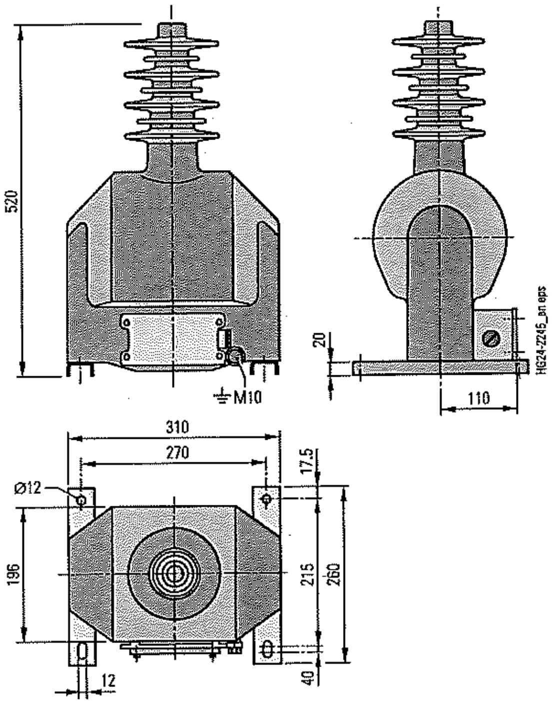
Type	h	Arcing distance	Creepage distance	Number of sheds
4MS32	520	420	790	2
4MS34	655	550	1055	5
4MS36	880	760	1615	10
4MS38	880	760	1615	10

Dimension drawing 20

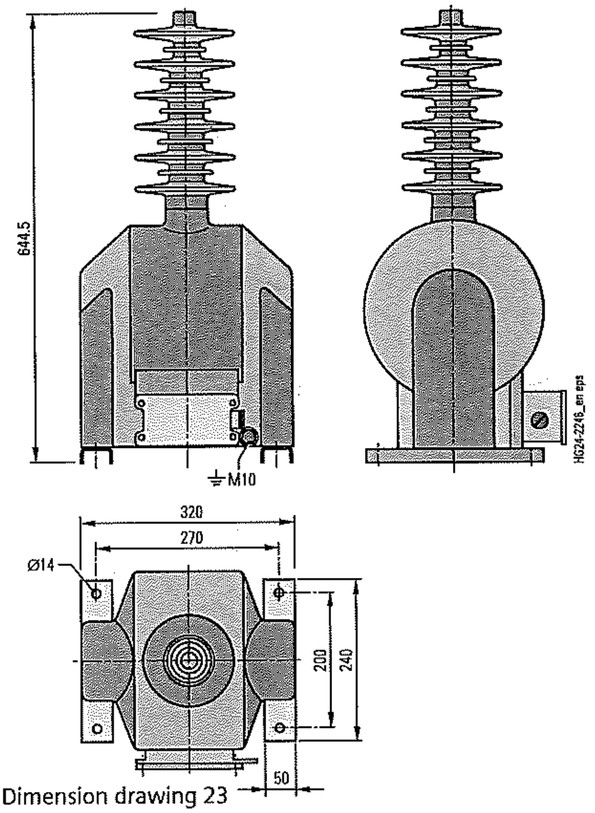


Type	h	b	e	Arcing distance	Creepage distance	Number of sheds
4MS42	515	375	270	420	760	2 x 2
4MS44	645	445	340	550	1035	2 x 5
4MS46	865	560	455	760	1595	2 x 10

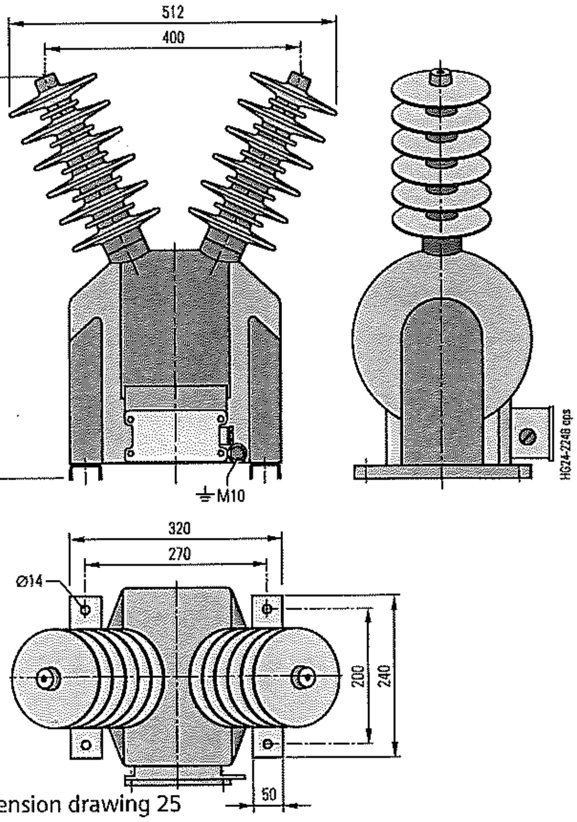
Dimension drawing 21

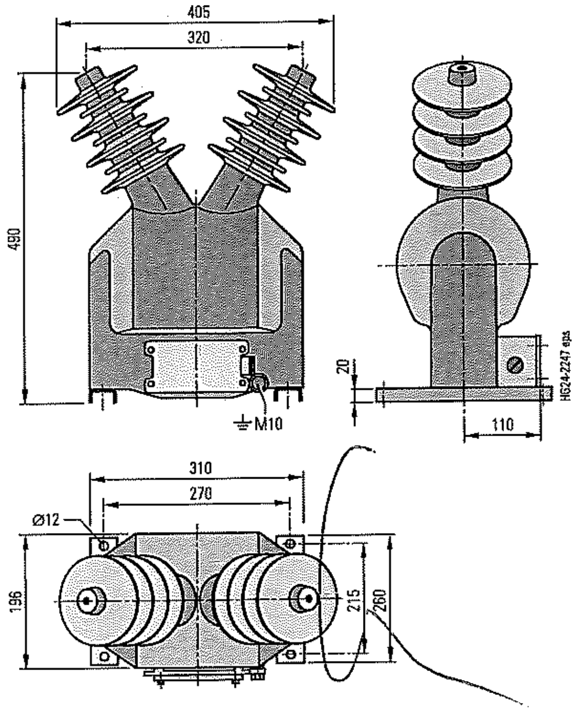


Dimension drawing 22



Dimension drawing 23

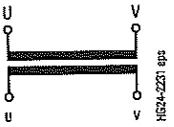
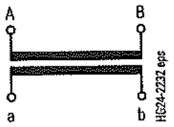
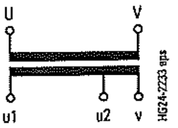
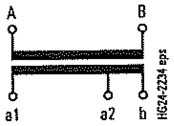
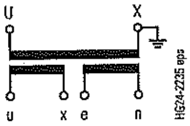
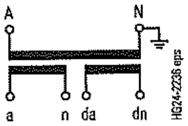




Dimension drawing 24

Dimension drawing 25

Terminal designations of the voltage transformers

Transformer design	Designation of the connection terminals		Example for low-voltage data
	acc. to VDE	acc. to IEC	
Unearthed 1 secondary winding			10000/100 V
Unearthed 1 secondary winding with tappings			5000–10000/100 V
	highest rated voltage at u1 or a1		
Earthed 1 measuring winding 1 auxiliary residual voltage winding			10000/√3 / 100/√3 / 100/3 V

Brandenburg Gate, Berlin, Germany

Switchgear Factory Berlin, Germany

Contents Page

Annex 83

Annex
Inquiry form

Please copy, fill in and return
to your Siemens partner.

Inquiry concerning

☐ 4MA7 current transformer
☐ 4MB1 current transformer
☐ 4MC2 current transformer
☐ 4MC3 current transformer
☐ 4ME2 current transformer
☐ 4ME3 current transformer
☐ 4MR voltage transformer
☐ 4MS voltage transformer

Please

☐ Submit an offer
☐ Call us
☐ Visit us

Your address

Company
Dept.
Name
Street
Postal code/city
Phone
Fax
E-mail

Siemens AG

Dept.
Name
Street
Postal code/city
Fax

Technical data of current transformer

				Other values
Operating voltage	☐ 12 kV ☐ 36 kV	☐ 17.5 kV ☐ 52 kV	☐ 24 kV	☐ ___kV
Rated lightning impulse withstand voltage	☐ 75 kV ☐ 170 kV	☐ 95 kV ☐ 250 kV	☐ 125 kV	☐ ___kV
Rated short-duration power-frequency withstand voltage	☐ 28 kV ☐ 70 kV	☐ 38 kV ☐ 95 kV	☐ 50 kV	☐ ___kV
Rated primary current	☐ ___A	☐ 2x___A		
Secondary current	☐ 1 A	☐ 5 A		
Thermal strength	☐ 100 x I_{PN} ☐ 300 x I_{PN} ☐ 600 x I_{PN}	☐ 150 x I_{PN} ☐ 400 x I_{PN} ☐ 800 x I_{PN}	☐ 200 x I_{PN} ☐ 500 x I_{PN} ☐ 1000 x I_{PN}	☐ ___x I_{PN}
1st core	☐ Protection core ☐ Measuring core	☐ ___Class ☐ ___Class	☐ ___Factor ☐ ___Factor	☐ ___VA ☐ ___VA
2nd core	☐ Protection core ☐ Measuring core	☐ ___Class ☐ ___Class	☐ ___Factor ☐ ___Factor	☐ ___VA ☐ ___VA
3rd core	☐ Protection core ☐ Measuring core	☐ ___Class ☐ ___Class	☐ ___Factor ☐ ___Factor	☐ ___VA ☐ ___VA

Technical data of voltage transformer

				Other values
Maximum operating voltage	☐ 12 kV ☐ 36 kV	☐ 24 kV ☐ 52 kV		☐ ___kV
Rated lightning impulse withstand voltage	☐ 75 kV ☐ 170 kV	☐ 95 kV ☐ 250 kV	☐ 125 kV	☐ ___kV
Rated short-duration power-frequency withstand voltage	☐ 28 kV ☐ 70 kV	☐ 38 kV ☐ 95 kV	☐ 50 kV	☐ ___kV
Rated primary voltage	☐ ___kV	☐ ___/$\sqrt{3}$		
Rated secondary voltage	☐ 100 V ☐ 100/$\sqrt{3}$ V	☐ 110 V ☐ 110/$\sqrt{3}$ V	☐ 120 V ☐ 120/$\sqrt{3}$ V	☐ ___V ☐ ___/$\sqrt{3}$ V
Auxiliary residual voltage winding	☐ Without	☐ 100/3 V	☐ 110/3 V	☐ 120/3 V
Rated output of the measuring winding	☐ Class 0.2 ☐ 20 VA	☐ Class 0.5 ☐ 50 VA	☐ Class 1 ☐ 100 VA	☐ ___VA

Application and other requirements

☐ Please check off ___ Please fill in

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You prefer to configure your instrument transformer on your own?

Please follow the steps for configuration and enter the order number in the configuration aid.

For configuration of your
4M protective and measuring transformers

Instruction for configuration of the 4M protective and measuring transformers

1st step: Definition of the current transformer

Please specify the following ratings:	Possible options:
Transformer design	Block-type transformer, bushing-type transformer, outdoor transformer, etc.
Operating voltage (U_m)	U_m: 12 kV to 52 kV
Rated lightning impulse withstand voltage (U_p)	U_p: 75 kV to 250 kV
Rated short-duration power-frequency withstand voltage (U_d)	U_d: 28 kV to 95 kV
Rated primary current (I_{PN})	I_{PN}: 20 A to 10000 A
Secondary current (I_{SN})	I_{SN}: 1 A or 5 A
Thermal strength	100 x I_{PN} to 1000 I_{PN}
Core data	Quantity, type, class, factor and rating of cores

These ratings define the positions 3 to 15 of the order number of the current transformer.

2nd step: Definition of the voltage transformer

Please specify the following ratings:	Possible options:
Transformer design	Block-type transformer, outdoor transformer
Number of phases	Single-phase or double-phase
Operating voltage (U_m)	U_m: 12 kV to 52 kV
Rated lightning impulse withstand voltage (U_p)	U_p: 75 kV to 250 kV
Rated short-duration power-frequency withstand voltage (U_d)	U_d: 28 kV to 95 kV
Rated primary voltage (U_{PN})	U_{PN}: 3.3 kV to 45 kV or values divided by $\sqrt{3}$
Rated secondary voltage (U_{SN})	U_{SN}: 100 V, 110 V, 120 V or values divided by $\sqrt{3}$
Rated output of the measuring winding	25 VA, class 0.2 up to 400 VA, class 1

These ratings define the positions 3 to 11 of the order number of the voltage transformer.

3rd step: Do you have any further requirements concerning the equipment?

Should you still need more options than the possible equipment like terminal designations according to VDE or IEC, selection of sizes, routine test certificate, etc., please contact your responsible sales partner.

1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16		
4	M	■	■	■	■	■	–	■	■	■	■	■	–	■	■	■	■	–	Z

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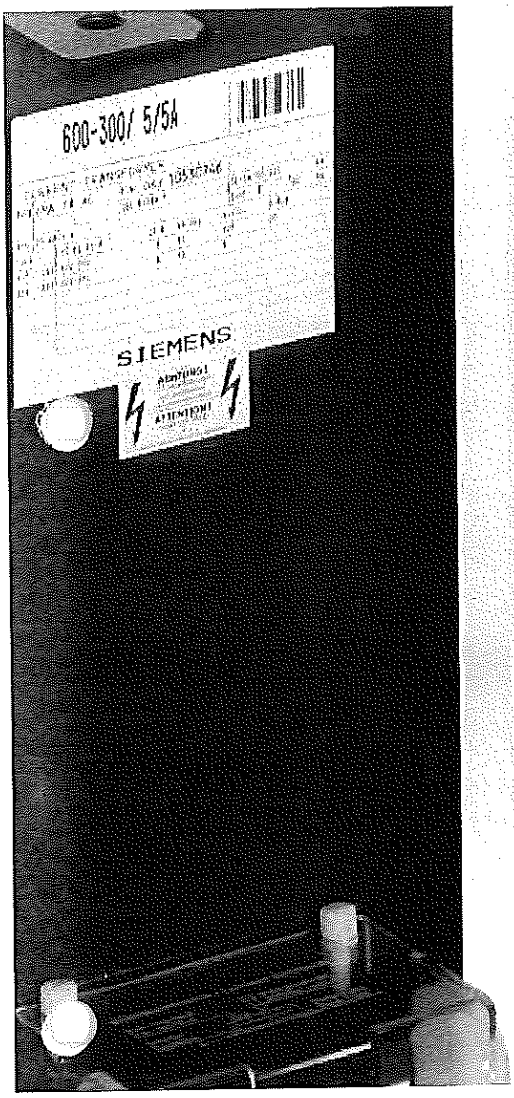

Siemens AG
Energy Sector
Freyeslebenstrasse 1
91058 Erlangen, Germany

Siemens AG
Energy Sector
Power Distribution Division
Medium Voltage
Nonnendammallee 104
13623 Berlin, Germany

For more information, please contact our
Customer Support Center.
Phone: +49 180 524 70 00
Fax: +49 180 524 24 71
(Charges depending on provider)
E-mail: support.energy@siemens.com

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www.siemens.com/energy

РЕПУБЛИКА БЪЛГАРИЯ
Български институт по метрология

REPUBLIC OF BULGARIA
Bulgarian Institute of Metrology

УДОСТОВЕРЕНИЕ ЗА ОДОБРЕН ТИП СРЕДСТВО ЗА ИЗМЕРВАНЕ

Measuring Instrument Type-approval Certificate

№ 16.11.5110

Издадено на производител: *Issued to manufacturer:*
SIEMENS AG - Germany
Wittelsbacherplatz 2, D-80333 Munich, Germany

На основание на: *In Accordance with:*
чл. 32, ал. 1 от Закона за измерванията (ДВ, бр. 46 от 2002 г., изм. бр. 88 от 05 г., изм. и доп. бр. 95 от 2005 г.)

Относно: *In Respect of:*
измервателни напреженови трансформатори тип 4MRxx

Знак за одобрен тип: *Type Approval Mark:*
BG 16
5110

Технически и метрологични характеристики: *Technical and metrological characteristics:*
приложение, неразделна част от настоящото удостоверение за одобрен тип средство за измерване

Срок на валидност: *Valid until:*
15.11.2026 г.

Вписва се в регистъра на одобрените за използване типове средства за измерване под №: *Reference №:*
5110

Дата на издаване на удостоверението за одобрен тип: *Date:*
15.11.2016 г.

ВЯРНО С ОР

И. Д. ПРЕДСЕ

П

На основание чл.36а ал.3 от ЗОП
[redacted]

Приложение към удостоверение за одобрен тип № 16.11.5110

Издадено на производител: SIEMENS AG - Germany
Wittelsbacherplatz 2, D-80333 Munich, Germany

Относно: измервателни напреженови трансформатори тип 4MRxx

1. Описание на типа:

Измервателни напреженови трансформатори тип 4MRxx се използват за измерване и защита на електрически мрежи с максимално допустимо работно напрежение до 36 kV.

Измервателните трансформатори тип 4MRxx са предназначени за вътрешен монтаж. Монтират се на подходящи поставки, проектирани за тях, в зависимост от конкретната ситуация.

Измервателни напреженови трансформатори могат да имат няколко вторични намотки, с еднакви или различни характеристики. Изолирани са една от друга електрически, но на един и същи магнитопровод. Те могат да бъдат с различен коефициент на трансформация и с различна мощност.

Измервателните трансформатори тип 4MRxx се произвеждат обикновенно само с едно ядро, което може да нарасне четири пъти, в зависимост от мощността и броя на вторичните намотки.

Първичната намотка е свързана към земя в клемната кутия. Тази връзка не може да бъде разкачвана по време на работа. За заземяване на вторичната намотка има специални болтове, по един за всеки край на намотката.

Основата на измервателните напреженови трансформатори тип 4MRxx е горещо галванизирана метална плоча.

Кутията с клемите на вторичната намотка е излята заедно с тялото на трансформатора от същата смола. Капакът е херметически затворен. Изводите са бронзови, никелирани, предназначени за присъединяване на болт с размер M6. Всеки край може да се свърже към заземителна клема, намираща се вътре в клемната кутия. За преминаване на кабелите през стените на кутията са осигурени два отвора - по един от двете ѝ страни, с диаметър от 10 mm до 14 mm. Уплътнението е чрез щуцер с размер PG 16.

Измервателните трансформатори тип 4MRxx могат да се монтират вертикално или хоризонтално.

2. Технически и метрологични характеристики:

Тип на трансформатора	4MR 12 (22)	4MR 14 (24)	4MR 56 (66)
Максимално работно напрежение, kV	до 12	до 24	до 36
Номинално първично напрежение, kV	от 3/√3 до 11/√3	от 13/√3 до 22/√3	от 20/√3 до 35/√3
Номинално вторично напрежение, V	100/3; 110/3; 120/3; 100/√3; 110/√3; 120/√3		
Номинална честота, Hz	50		
Клас на точност: - измервателна намотка - защитна намотка	0,2; 0,5; 1; 3 3P; 6P		
Мощност на вторичните намотки, VA/клас на точност: - измервателна намотка - защитна намотка	(от 5 до 70)/0,2; (от 5 до 200)/0,5; (от 5 до 200)/1; (от 5 до 300)/3; (от 5до 300)/3P; (от 5 до 300)/6P		

3. Типово означение: 4MRxx:

4MR	**x**	**x**
Напреженов измервателен трансформатор	**1** - за вътрешен монтаж, еднофазен, малък; **2** - за вътрешен монтаж, двуфазен, малък; **5** - за вътрешен монтаж, еднофазен, голям; **6** - за вътрешен монтаж, двуфазен, голям	Максимално работно напрежение: **2** – до 12 kV **4** – до 24 kV **6** – до 36 kV

4. Описание на местата, предназначени за поставяне на знаци от метрологичен контрол:

- Знакът за одобрен тип (марка за залепване) се поставя до табелката с технически данни;
- Знакът за първоначална проверка (марка за залепване) се поставя до знака за одобрен тип.

SIEMENS

VOLTAGE TRANSFORMER TEST CERTIFICATE

Customer	Siemens Eood		**Customer Order No**	9500048346
Order No		16975/30	**Customer Project No**	
			Customer Product No	

Type	4MR14 AYC	**Ratio**	20000/V3/100/V3-100/V3				
F.(Hz)	50Hz	**Is cl**	E	**kV**	24/50/125kV		
				Standard	IEC 61869-3		

Sec. Tap	**Prim(V)**	**Sec.(V)**	**VA**	**ACC. Class**	**Ith (A)**	
1a-1n	20000/V3	100/V3	50	0.5	2	
2a-2n	20000/V3	100/V3	50	3P	2	

Power- Frequency Test (60sn)			
Prim.↔ ≡		**Sec.↔ ≡**	**Sec.↔ Sec.**
50kV		3kV	3kV
OK		OK	OK

Verification of terminal markings	**OK**

Test Values

Serial No	**Primary-Sec.**	**Core**	**Burden**	**%**	**VA**	**δ Value**	**%F Value**
1000925677	20000/V3-100/V3	1a-1n	%25VA	%80xUn	12,5	0	0.37
				%100xUn	12,5	1	0.35
				%120xUn	12,5	2	0.33
			%100VA	%80xUn	50	3	-0.34
				%100xUn	50	4	-0.36
				%120xUn	50	5	-0.38
	20000/V3-100/V3	2a-2n	%25VA	%5xUn	12,5	-2	1.09
				%190xUn	12,5	6	1.03
			%100VA	%5xUn	50	7	0.07
				%190xUn	50	12	0.05
	@1.2 Um (pC)				1		
	@1.2 Um/V3 (pC)				1		

Tester	**Date**		**Approved**	**Date**
Selim UŞDİ	04.04.2014		Yıldız AKIN	04.04.2014

ВЯРНО С
ОРИГИНАЛА

Deutsche Akkreditierungsstelle GmbH
(Германски акредитационен орган ГмбХ)

Упълномощен в съответствие с Подраздел 1 на Раздел 8 на AkkStelleG във връзка с Подраздел 1 на Раздел 1 на AkkStelleG
Подписал Многостранните споразумения на EA, ILAF и IAF за взаимно признаване

Акредитация

Deutsche Akkreditierungsstelle GmbH (Германски акредитационен орган ГмбХ) удостоверява, че изпитвателната лаборатория

IPH Institut "Prüffeld für elektrische Hochleistungstechnik" GmbH
Landsberger Alee 378 A, 12681 Berlin
(Институт ИПХ „Прюфелд фюр Електрише Хохлайщунгстехник" ГмбХ
Алея Ландсбергер 378 А, 12681 Берлин)

е компетентна по условията на DIN EN ISO/IEC 17025:2005 да извършва изпитания в следните области:

Апаратура и компоненти за високо напрежение
Апаратура и компоненти за ниско напрежение
Комутационна, защитна и управляваща апаратура
Кабели и кабелни аксесоари за високо, средно и ниско напрежение

Акредитационният сертификат важи във връзка с известието за акредитация от 11.11.2015 г. с акредитационен номер D-PL-12107-01 и е валиден до 10.11.2020 г. Той се състои от заглавния лист, обратната страна на заглавния лист и следващия анекс с общо 42 страници.

Регистрационен номер на сертификата: **D-PL-12107-01-00**

Франкфурт на Майн, 11.11.2015 г.

/подпис – не се чете/
инж. Ралф Егнер
Ръководител отделение

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Офис Брауншвайг
Бундесалее 100
38116 Брауншвайг

Публикуването на извадки от акредитационния сертификат подлежи на предварително писмено одобрение от Deutsche Akkreditierungsstelle GmbH (DAkkS). Изключение е непроменената форма на отделни разпространения на заглавния лист от споменатия на обратната страна на листа орган за оценка на съответствието.

Не трябва да се създава впечатление, че акредикацията е разширена до области извън обхвата на акредитация , удостоверен от DAkkS.

Акредитацията е дадена съгласно Закона за акредитационния орган (AkkStelleG) от 31 юли 2009 г. (Вестник за федерални закони I стр. 2625) и РЕГЛАМЕНТ (ЕО) № 765/2008 на Европейския парламент и на Съвета от 9 юли 2008 г. за определяне на изискванията за акредитация и надзор на пазара във връзка с предлагането на пазара на продукти (Официален вестник на Европейския съюз L 218 от 9 юли 2008 г., стр. 30). DAkkS е подписал Многостранното споразумение за взаимно признаване на европейското сътрудничество за акредитация (EA), Международния акредитационен форум (IAF) и Международното сътрудничество за акредитиране на лаборатории (ILAC). Подписалите тези споразумения признават взаимно своите акредитации.

Текущото състояние на членството може да бъде намерено на следните уебсайтове:
EA: www.european-accreditation.org
ILAC: www. ilac.org
IAF: www.iaf.nu

ВЯРНО С
ОРИГИНАЛА

DAkkS
Deutsche
Akkreditierungsstelle

Deutsche Akkreditierungsstelle GmbH

Entrusted according to Section 8 subsection1 AkkStelleG in connection with Section 1 subsection 1 AkkStelleGBV
Signatory to the Multilateral Agreements of
EA, ILAC and IAF for Mutual Recognition

Accreditation

The Deutsche Akkreditierungsstelle GmbH attests that the testing laboratory

IPH Institut "Prüffeld für elektrische Hochleistungstechnik" GmbH
Landsberger Allee 378 A, 12681 Berlin

is competent under the terms of DIN EN ISO/IEC 17025:2005 to carry out tests in the following fields:

High-voltage equipment and components
Low-voltage equipment and components
Installation, switching, control and protective equipment
High-voltage, medium-voltage and low-voltage cables and their accessories

The accreditation certificate shall only apply in connection with the notice of accreditation of 2015-11-11 with the accreditation number D-PL-12107-01 and is valid until 2020-11-10. It comprises the cover sheet, the reverse side of the cover sheet and the following annex with a total of 42 pages.

Registration number of the certificate: **D-PL-12107-01-00**

ВЯРНО С
ОРИГИНАЛА

Frankfurt, 2015-11-11

Dipl.-Ing. (FH) Ralf Egner
Head of Division

This document is a translation. The definitive version is the original German accreditation certificate.

See notes overleaf.

Deutsche Akkreditierungsstelle GmbH

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60594 Frankfurt am Main

Office Braunschweig
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The publication of extracts of the accreditation certificate is subject to the prior written approval by Deutsche Akkreditierungsstelle GmbH (DAkkS). Exempted is the unchanged form of separate disseminations of the cover sheet by the conformity assessment body mentioned overleaf.

No impression shall be made that the accreditation also extends to fields beyond the scope of accreditation attested by DAkkS.

The accreditation was granted pursuant to the Act on the Accreditation Body (AkkStelleG) of 31 July 2009 (Federal Law Gazette I p. 2625) and the Regulation (EC) No 765/2008 of the European Parliament and of the Council of 9 July 2008 setting out the requirements for accreditation and market surveillance relating to the marketing of products (Official Journal of the European Union L 218 of 9 July 2008, p. 30). DAkkS is a signatory to the Multilateral Agreements for Mutual Recognition of the European co-operation for Accreditation (EA), International Accreditation Forum (IAF) and International Laboratory Accreditation Cooperation (ILAC). The signatories to these agreements recognise each other's accreditations.

The up-to-date state of membership can be retrieved from the following websites:
EA: www.european-accreditation.org
ILAC: www.ilac.org
IAF: www.iaf.nu

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Annex to the Accreditation Certificate D-PL-12107-01-00 according to DIN EN ISO/IEC 17025:2005

Period of validity: 2015-11-11 to 2020-11-10 Date of issue: 2015-11-11

Holder of certificate:

IPH Institut "Prüffeld für elektrische Hochleistungstechnik" GmbH
Landsberger Allee 378 A, 12681 Berlin

Tests in the fields:

High-voltage equipment and components
Low-voltage equipment and components
Railway applications
Installation, switching control and protective equipment
High-voltage, medium-voltage and low-voltage cables and their accessories

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.

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Testing of high-voltage equipment and components as described in the subsequent listed standards			
High-voltage Switchgear, Control gear and Assemblies (general)			
Electrical engineering	IEC 62271-1 (2011-08) Ed. 1.1 EN 62271-1:2008/A1:2011 DIN EN 62271-1 VDE 0671-1/A1): 2012-04	High-voltage switchgear and controlgear – Part 1: Common specifications	

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Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
High-voltage Switchgear and Control gear			
Electrical engineering	IEC 62271-100 (2012-09) Ed. 2.1 STL-Guide EN 62271-100:2009 + A1:2012 DIN EN 62271-100:2013-08 VDE 0671-100	High-voltage switchgear and controlgear – Part 100: High-voltage alternating-current circuit-breakers	
Electrical engineering	IEC 62271-101 (2012-10) Ed. 2.0 STL-Guide EN 62271-101:2013 DIN EN 62271-101:2013-08 VDE 0671-101	High-voltage switchgear and controlgear – Part 101: Synthetic testing	
Electrical engineering	IEC 62271-108 (2005-10) Ed. 1.0 EN 62271-108:2006 DIN EN 62271-108:2006-10 VDE 0671-108	High-voltage switchgear and controlgear – Part 108: High-voltage alternating current disconnecting circuit-breakers for rated voltages of 72,5 kV and above	
Electrical engineering	IEC 62271-109 EN 62271-109:2009 + A1:2013 DIN EN 62271-109:2014-02 VDE 0671-109	High-voltage switchgear and controlgear – Part 109: Alternating-current series capacitor by-pass switches	
Electrical engineering	IEC 62271-110 (2012-09) Ed. 3.0 EN 62271-110:2012 DIN EN 62271-110:2013-08 VDE 0671-110	High-voltage switchgear and controlgear – Part 110: Inductive load switching	
Electrical engineering	IEEE C37.60-2012 IEC 62271-111 (2012-09) Ed. 2.0 VDE 0671-111	Overhead, pad-mounted, dry vault, and submers-ible automatic circuit reclosersand fault interrupters for alternating current systems up to 38 kV.	
Electrical engineering	IEC 62271-205 EN 62271-205:2008 DIN EN 62271-205:2008-12 VDE 0671-205	High-voltage switchgear and controlgear – Part 205: Compact switchgear assemblies for rated voltages above 52 kV.	

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Load switches			
Electrical engineering	IEC 62271-103 DIN IEC 62271-103 EN 62271-103:2011 DIN EN 62271-103:2012-04 VDE 0671-103 STL-Guide	High-voltage switchgear and controlgear – Part 103: Switches for rated voltages above 1 kV up to and including 52 kV.	
Electrical engineering	IEC 62271-104 (2015-02) Ed. 2.0 EN 62271-104:2009 DIN EN 62271-104:2010-03 VDE 0671-104	High-voltage switchgear and controlgear – Part 104: Alternating current switches for rated voltages higher than 52 kV.	
Electrical engineering	IEC 62271-105 (2012-09) Ed. 2.0 EN 62271-105:2012 DIN EN 62271-105:2013-08 VDE 0671-105	High-voltage switchgear and controlgear – Part 105: Alternating current switch-fuse combinations for rated voltages above 1 kV up to and including 52 kV.	
Electrical engineering	IEC 62271-107 (2012-05) Ed. 2.0 EN 62271-107:2012 DIN EN 62271-107:2013-03 VDE 0671-107	High-voltage switchgear and controlgear – Part 107: Alternating current fused circuit-switchers for rated voltages above 1 kV up to and including 52 kV.	
Current contactors and motor starters			
Electrical engineering	IEC 62271-106 (2014-02) Ed. 1.0 + Corr 1 EN 62271-106:2011 DIN IEC 62271-106:2012-06 VDE 0671-106	High-voltage alternating current contactors and contactor-based motor starters.	
Current disconnectors and earthing switches			
Electrical engineering	IEC 62271-102 (2013-02) Ed. 1.0 + am2 EN 62271-102:2002/A2:2013 DIN EN 62271-102/A2:2013-12 VDE 0671-102/A2	High-voltage switchgear and controlgear – Part 102: Alternating current disconnectors and earthing switches.	

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Fuses			
Electrical engineering	IEC 60282-1 (2014-07) Ed. 7.1 STL-Guide EN 60282-1:2009 + A1:2014 DIN EN 60282-1:2015-05 VDE 0670-4	High-voltage fuses – Part 1: Current-limiting fuses.	
Electrical engineering	IEC 60282-2 (2008-04) Ed. 3.0	High-voltage fuses; – Part 2: Expulsion fuses	
Electrical engineering	IEC 60644 (2009-08) Ed. 2.0 EN 60644:2009 DIN EN 60644:2010-07 VDE 0670-401	Specification for high-voltage fuse-links for motor circuit applications.	
High-voltage switchgear and control gear assemblies			
Electrical engineering	IEC 62271-200 (2011-10) Ed. 2.0 STL- Guide EN 62271-200:2012 DIN EN 62271-200:2012-08 VDE 0671-200	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.	
Electrical engineering	IEC 62271-201 (2014-03) Ed. 2.0 EN 62271-201:2014 DIN EN 62271-201:2015-03 VDE 0671-201	High-voltage switchgear and controlgear – Part 201: A.C. insulation-enclosed switchgear and controlgear for rated voltages above 1 kV and up to and including 52 kV.	
Electrical engineering	IEC 62271-203 (2013-07) Ed. 2.0 + Corr. 1 STL-Guide EN 62271-203:2012 DIN EN 62271-203:2012-11 VDE 0671-203	High-voltage switchgear and controlgear – Part 203: Gas-insulated metal-enclosed switchgear for rated voltages above 52 kV.	
Electrical engineering	IEC 62271-204 (2011-07) Ed. 1.0 STL-Guide EN 62271-204:2011 DIN EN 62271-204:2012-05 VDE 0671-204	High-voltage switchgear and controlgear – Part 204: Rigid gas-insulated transmission lines for rated voltage above 52 kV.	

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Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	IEC 62271-209 (2007-08) Ed. 1.0 EN 62271-209:2007 DIN EN 62271-209:2008-07 VDE 0671-209	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.	
Electrical engineering	IEC 62271-202 EN 62271-202:2014 + AC:2014 DIN EN 62271-202:2015-02 VDE 0671-202	High-voltage switchgear and controlgear – Part 202: High voltage / low voltage prefabricated substation.	
Electrical engineering	IEC 62271-205 (2008-01) Ed. 1.0 EN 62271-205:2008 DIN EN 62271-205:2008-12 VDE 0671-205	High-voltage switchgear and controlgear – Part 205: Compact switchgear assemblies for rated voltages above 52 kV.	
Electrical engineering	ANSI / IEEE C37.23-2003	IEEE Standard for Metal-Enclosed Bus	
Switch gear for direct current			
Electrical engineering	DIN VDE 0660-112:1987-02 VDE 0660-112	Schaltgeräte; Zusatzbestimmungen für Gleichstrom-Lastschalter, -Trenner und -Lasttrenner über 1200 V bis 3000 V.	
Power transformers, reactors, line traps, tap-changers			
Electrical engineering	IEC 60076-1 (2011-04) Ed. 3.0 EN 60076-1:2011 DIN EN 50076-1:2012-03 VDE 0532-76-1	Power transformers – Part 1: General.	
Electrical engineering	IEC 60076-2 (2011-02) Ed. 3.0 EN 60076-2:2011 DIN EN 60076-2:2012-02 VDE 0532-76-2	Power transformers – Part 2: Temperature rise for liquid-immersed transformers.	
Electrical engineering	IEC 60076-3 (2013-07) Ed. 3.0 EN 60076-3:2013 DIN EN 60076-3:2014-08 VDE 0532-76-3	Power transformers – Part 3: Insulation levels, dielectric tests and external clearances in air.	

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	VDE 0532-76 -4 DIN EN 60076-4:2003-06 IEC 60076-4 (2002-06) Ed. 1.0	Power transformers – Part 4: Guide to the lightning impulse and switching impulse testing - Power transformers and reactors.	
Electrical engineering	IEC 60076-5 (2006-02) Ed. 3.0 STL-Guide EN 60076-5:2006 DIN EN 60076-5:2007-01 VDE 0532-76-5	Power transformers – Part 5: Ability to withstand short circuit.	
Electrical engineering	IEC 60076-6 (2007-12) Ed. 1.0 EN 60076-6:2008 DIN EN 60076-6:2009-02 VDE 0532-76-6	Power transformers – Part 6: Reactors.	
Electrical engineering	IEC 60076-10 (2001-05) Ed. 1.0 IEC 60076-10-1 (2005-10) Ed. 1.0 EN 60076-10:2001 DIN EN 60076-10:2002-04 VDE 0532-76-10	Power transformers – Part 10-1: Determination of sound levels (+ Application guide).	
Electrical engineering	IEC 60076-11 (2004-05) Ed. 1.0 EN 60076-11:2004 DIN EN 60076-11:2005-04 VDE 0532-76-11	Power transformers – Part 11: Dry-type transformers.	
Electrical engineering	IEC 60076-13 EN 60076-13:2006 DIN EN 60076-13:2007-07 VDE 0532-76-13	Power transformers – Part 13: Self-protected liquid-filled transformers.	
Electrical engineering	DIN 57532-21:1982-03 VDE 0532-21	Transformatoren und Drosselspulen; Anlasstransformatoren und Anlassdrosselspulen	
Electrical engineering	VDE 0532 Teil 30 DIN EN 60214:2015-04 IEC 60214-1 (2014-05) Ed. 2.0	Tap-changer	

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Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	VDE 0851 IEC 60353 (2004-04) Ed. 2.0	Line traps for a.c. power systems.	
Instrument transformers			
Electrical engineering	IEC 61869-1 (2007-10) Ed. 1.0 EN 61869-1:2009 DIN EN 61869-1:2010-04 VDE 0414-9-1	Instrument transformers – Part 1: General requirements.	
Electrical engineering	IEC 61869-2(2012-09) Ed. 1.0 EN 61869-2:2012 DIN EN 61869-2:2013-07 + Ber. VDE 0414-9-2	Instrument transformers – Part 2: Additional requirements for current transformers.	
Electrical engineering	IEC 61869-3 (2011-07) Ed. 1.0 EN 61869-3:2011 DIN EN 61869-3:2012-05 VDE 0414-9-3	Instrument transformers – Part 3: Additional requirements for inductive voltage transformers.	
Electrical engineering	IEC 61869-4 (2013-11) Ed. 1.0 EN 61869-4:2014 DIN EN 61869-4:2015-04 VDE 0414-9-4	Instrument transformers – Part 4: Additional requirements for combined transformers.	
Electrical engineering	VDE 0414-9-5 DIN EN 61869-5:2012-05 IEC 61869-5 (2015-08) Ed. 1.0	Capacitive Voltage Transformers.	
Electrical engineering	VDE 0414-44-8 DIN EN 60044-8:2003-06 IEC 60044-8 (2002-07) Ed.1.0 IEC 61869-8	Instrument transformers – Part 8: Electronic current transformers	
Electrical engineering	IEC 60044-7 (1999-12) Ed. 1.0 EN 60044-7:2000-11 DIN EN 60044-7:2000-11 VDE 0414-44-7 IEC 61869-7	Instrument transformers – Part 7: Electronic voltage transformers.	
Capacitors			
Electrical engineering	DIN VDE 0560-1:1969-12 VDE 0560-1	Bestimmungen für Kondensatoren – Teil 1: Allgemeine Bestimmungen.	

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	IEC 60252-1 (2013-08) Ed. 2.1 EN 60252-1:2011 + A1:2013 DIN EN 60252-1:2014-07 VDE 0560-8	AC motor capacitors – Part 1: General - Performance, testing and rating - Safety requirements - Guidance for installation and operation.	
Electrical engineering	IEC 60110-1 (1998-06) Ed. 1.0 EN 60110-1:1998 DIN EN 61110-1:1999-09 VDE 0560-9	Power capacitors for induction heating installations – Part 1: General.	
Electrical engineering	DIN VDE 0560-10:1964-10 VDE 0560-10	Regeln für Kondensatoren – Teil 10: Regeln für Hochfrequenz-Leistungskondensatoren.	
Electrical engineering	DIN VDE 0560-11:1970-05 VDE 0560-11	Regeln für Kondensatoren – Teil 11: Regeln für Kondensatoren ab 600 V zum Glätten pulsierender Gleichspannung.	
Insulators and bushings			
Electrical engineering	DIN VDE 0441-1:1985-07 VDE 0441-1	Prüfung von Kunststoff-Isolatoren für Betriebswechselspannungen über 1 kV; Prüfung von Werkstoffen für Freiluftisolatoren.	
Electrical engineering	IEC 60660 (1999-10) Ed. 2.0 EN 60660:1999 DIN EN 60660:2000-12 VDE 0441-3	Insulators – Tests on indoor post insulators of organic material for systems with nominal voltages greater than 1000 V up to but not including 300 kV.	
Electrical engineering	IEC 60383-1 (1993-04) Ed. 4.0 EN 60383-1:1996 DIN EN 60383-1:1997-05 VDE 0446-1	Insulators for overhead lines with a nominal voltage above 1000 V – Part 1: Ceramic or glass insulator units for a.c. systems - Definitions, test methods and acceptance criteria.	
Electrical engineering	IEC 60383-2 (1993-04) Ed. 1.0 EN 60383-2:1995 DIN EN 60383-2:1995-08 VDE 0446-4	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.	

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	IEC 60168 (2001-04) Ed. 4.2 EN 60168:1994 DIN EN 60168:2001-12 VDE 0674-1	Tests on indoor and outdoor post insulators of ceramic material or glass for systems with nominal voltages greater than 1000 V.	
Electrical engineering	IEC 62155 (2003-05) Ed. 1.0 EN 62155:2003 DIN EN 62155:2004 VDE 0674-200	Hollow pressurized and unpressurized ceramic and glass insulators for use in electrical equipment with rated voltages greater than 1000 V.	
Electrical engineering	IEC 60137 (2008-07) Ed. 6.0 EN 60137:2008 DIN EN 60137:2009-07 VDE 0674-5	Insulated bushings for alternating voltages above 1000 V.	
Overhead lines			
Electrical engineering	IEC 61284 (1997-09) Ed. 2.0 + Corr. EN 61284:1997 DIN EN 61284:1998-05 VDE 0212-1	Overhead lines – Requirements and tests for fittings.	
Electrical engineering	IEC 61854 (1998-09) Ed. 1.0 EN 61854:1998 DIN EN 61854:1999-08 VDE 0212-2	Overhead lines – Requirements and tests for spacers.	
Electrical engineering	IEC 61897 (1998-09) Ed. 1.0 EN 61897:1998 DIN EN 61897:1999-08 VDE 0212-3	Overhead lines – Requirements and tests for Stockbridge type aeolian vibration dampers.	

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	DIN VDE 0216:1986-2 VDE 0216	Armaturen für Fahrleitungsanlagen; Statisch-mechanisches Verhalten – Anforderungen, Prüfung.	
HVDC Thyristor valves			
Electrical engineering	IEC 60700-1 (2008-11) Ed. 1.2 EN 60700-1:1998 + A1:2003 + A2:2008 DIN EN 60700-1:2009-07 VDE 0553-1	Thyristor valves for high voltage direct current (HVDC) power transmission – Part 1: Electrical testing.	
Equipment for operating, testing, marking off, live working. Equipment for earthing, short-circuiting.			
Electrical engineering	DIN VDE 0681-1:1986-10 VDE 0681-1	Geräte zum Betätigen, Prüfen und Abschranken unter Spannung stehender Teile mit Nennspannungen über 1 kV; Allgemeine Festlegungen.	
Electrical engineering	DIN 57681-2:1977-03 DIN VDE 0681-2:1977-03 VDE 0681-2	Geräte zum Betätigen, Prüfen und Abschranken unter Spannung stehender Teile mit Nennspannungen über 1 kV; Schaltstangen.	
Electrical engineering	DIN 57681-3:1977-03 DIN VDE 0681-3 VDE 0681-3	Geräte zum Betätigen, Prüfen und Abschranken unter Spannung stehender Teile mit Nennspannungen über 1 kV; Sicherungszangen.	
Electrical engineering	DIN VDE 0681-6:1985-06 VDE 0681-6	Geräte zum Betätigen, Prüfen und Abschranken unter Spannung stehender Teile mit Nennspannungen über 1 kV; Spannungsprüfer für Oberleitungsanlagen elektrischer Bahnen; 15 kV, 16 2/3 Hz.	
Electrical engineering	DIN VDE 0681-8:2003-10 VDE 0681-8	Geräte zum Betätigen, Prüfen und Abschranken unter Spannung stehender Teile mit Nennspannungen über 1 kV; Isolierende Schutzplatten.	

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	IEC 60832-1 (2010-02) Ed. 1.0 EN 60832-1:2010 + Cor.:2010 DIN EN 60832-1:2010-12 VDE 0682-211	Live working – Insulating sticks and attachable devices – Part 1: Insulating sticks.	
Electrical engineering	IEC 61229 (2002-06) Ed. 1.2 EN 61229:1995/A2:2002 DIN EN 61229/A2:2003-09 VDE 0682-551 /A2	Rigid protective covers for live working on a.c. installations.	
Electrical engineering	IEC 61230 (2008-07) Ed. 2.0 EN 61230:2008 DIN EN 61230:2009-07 VDE 0683-100	Live working – Portable equipment for earthing or earthing and short-circuiting.	
Electrical engineering	IEC 61219 (1993-10) Ed. 1.0 + Cor.200-05 EN 61219:1993 DIN EN 61219:1995-01 VDE 0683-200	Live working – Earthing or earthing and short-circuiting equipment using lances as a short-circuiting device – Lance earthing.	
High-voltage test techniques			
Electrical engineering	IEC 60270 (2000-12) Ed. 3.0 + Cor.1 EN 60270:2001 + Ber. DIN EN 60270:2001-08 + Ber. VDE 0434	High-voltage test techniques – Partial discharge measurements.	
Electrical engineering	IEC 60060-1 (2010-09) Ed. 3.0 STL-Guide HD 558.1 S1 EN 60060-1:2010 DIN EN 60060-1:2011-10 VDE 0432-1	High-voltage test techniques – Part 1: General definitions and test requirements.	
Electrical engineering	IEC 60060-2 (2010-11) Ed. 3.0 EN 60060-2:2011 DIN EN 60060-2:2011-10 VDE 0432-2	High-voltage test techniques – Part 2: Measuring systems.	

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- Translation -

Testing field	**Standard / In-House Procedure / Version**	**Title of Standard or In-House Procedure (Deviations / Modifications of Standard)**	**Test Range / Restrictions**
Electrical engineering	VDE 0432-3 DIN-EN 60060-3:2006-08 IEC 60060-3 (2006-02) Ed. 1.0	High-voltage test techniques – Part 3: Definitions and requirements for on-site testing	
Electrical engineering	IEC 60052 (2002-10) Ed. 3.0 EN 60052:2002 DIN EN 60052:2003-06 VDE 0432-9	Voltage measurement by means of standard air gaps.	
Environmental and protection degree testing			
Electrical engineering	IEC 60068-2-78 (2012-10) Ed. 2.0 EN 60068-2-78:2013 DIN EN 60068-2-78:2014-02 VDE 0468-2-78	Environmental testing – Part 2-78: Tests – Test Cab: Damp heat, steady state.	
Electrical engineering	IEC 60068-3-4 (2001-08) Ed. 1.0	Environmental testing – Part 3-4: Supporting documentation and guidance – Damp heat tests.	
Electrical engineering	IEC 60068-2-30 (2005-08) Ed. 3.0	Environmental testing – Part 2-30: Tests – Test Db: Damp heat, cyclic (12 h + 12 h cycle).	
Electrical engineering	IEC 60068-2-75 (2014-09) Ed. 2.0	Environmental testing – Part 2-75: Tests – Test Eh: Hammer tests.	

Technical responsibility for the test reports:

Approval:	**Technical verification:**
Herr Dipl.-Ing. Ronald Borchert	Herr Dipl.-Ing. Rainer Borchert
Herr Dipl.-Ing. Winfried Moritz	Herr Dipl.-Ing. Ronald Borchert
Herr Dipl.-Wirt.-Ing. Rainer Schiller	Herr Dipl.-Ing. Jens Haring
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Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Testing of low-voltage equipment and components as well as of installation, switching, control and protective equipment and railway applications as described in the subsequent listed standards.			
Railway applications			
Electrical engineering	VDE 0115 - 300-1 DIN EN 50123-1:2003-12 EN 50123-1:2003 IEC 61992-1 (2014-04) Ed. 2.1	Railway applications – Fixed installations – DC switchgear – Part 1: General.	
Electrical engineering	VDE 0115 - 300-2 DIN EN 50123-2:11-2003 EN 50123-2:2003 IEC 61992-2 (2014-04) Ed. 2.1	Railway applications – Fixed installations – DC switchgear – Part 2: DC circuit-breakers.	
Electrical engineering	VDE 0115 - 300-3 DIN EN 50123-3:10-2003 EN 50123-3:2003 IEC 61992-3 (2006-02) Ed. 2.0	Railway applications – Fixed installations – DC switchgear – Part 3: Indoor d.c. disconnectors, switch-disconnectors and earthing switches.	
Electrical engineering	VDE 0115 - 300-4 DIN EN 50123-4/A1 02-2014 EN 50123-4/A1:2013 IEC 61992-4 (2006-02) Ed 1.0	Railway applications – Fixed installations – DC switchgear – Part 4: Outdoor d.c. disconnectors, switch-disconnectors and earthing switches.	
Electrical engineering	IEC 61992-5 (2006-02) Ed. 1.0 DIN EN 50526-1:2012 VDE 0115-526-1:2012 EN 50526-1:2012	Railway applications – Fixed installations – DC switchgear – Part 5: Surge arresters and low-voltage limiters for specific use in d.c. systems.	
Electrical engineering	DIN EN 50526-2:2014 VDE 0115-526-2:2014 EN 50526-2:2014	Bahnanwendungen – Ortsfeste Anlagen – Überspannungsableiter und Spannungsbegrenzungseinrichtungen für Gleichspannungsnetze – Teil 2: Spannungsbegrenzungseinrichtungen.	
Electrical engineering	VDE 0115 - 300-6 DIN EN 50123-6:09-2003 EN 50123-6:2003 IEC 61992-6 (2014-04) Ed. 1.1	Railway applications – Fixed installations – DC switchgear – Part 6: DC switchgear assemblies.	

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	VDE 0115 Teil 420 DIN EN 60310:2005-01 IEC 60310 (2004-02) Ed. 3.0	Railway applications – Traction transformers and inductors on board rolling stock.	
Electrical engineering	IEC 60077-1 (1999-10) Ed. 1.0 DIN EN 60077-1:2003-04 VDE 0115-460-1	Railway applications – Electric equipment for rolling stock – Part 1: General service conditions and general rules.	
Electrical engineering	IEC 60077-2 (1999-03) Ed. 1.0 DIN EN 60077-2:2003-04 VDE 0115-460-2	Railway applications – Electric equipment for rolling stock – Part 2: Electrotechnical components – General rules.	
Electrical engineering	IEC 60077-3 (2001-12) Ed. 1.0 DIN EN 60077-3:2003-04 VDE 0115-460-3	Railway applications – Electric equipment for rolling stock – Part 3: Electrotechnical components – Rules for d.c. circuit-breakers.	
Electrical engineering	IEC 60077-4 (2003-02) Ed. 1.0 DIN EN 60077-4:2004-01 VDE 0115-460-4	Railway applications – Electric equipment for rolling stock – Part 4: Electrotechnical components – Rules for AC circuit-breakers.	
Electrical engineering	IEC 60077-5 (2003-07) Ed. 1.0 DIN EN 60077-5:2004-07 VDE 0115-460-5	Railway applications – Electric equipment for rolling stock – Part 5: Electrotechnical components – Rules for HV fuses.	
Electrical engineering	VDE 0115-327 DIN EN 50327:2006-03 EN 50327:2006-03 IEC 62589 (2010-07) Ed. 1.0	Railway applications – Fixed installations – Harmonisation of the rated values for converter groups and tests on converter groups.	
Electrical engineering	VDE 0115-328 DIN EN 50328:2010-11 EN 50328:2010-11 IEC 62590 (2010-06) Ed. 1.0	Railway applications – Fixed installations – Electronic power converters for substations.	

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	VDE 0560-700 DIN EN 61921:2004-02 EN 61921:2003-07 IEC 61921 (2003-04) Ed. 1.0	Power capacitors Low-voltage power factor correction banks.	
Electrical engineering	VDE 0115 - 410 DIN EN 61287-1:2014-12 EN 61278-1:2014-07 IEC 61287-1 (2014-07) Ed. 3.0	Railway applications – Power convertors installed on board rolling stock – Part 1: Characteristics and test methods.	
Low-voltage switchgear and control gear			
Electrical engineering	VDE 0660 - 100 DIN EN 60947-1:2011-10 EN 60947-1:2011 IEC 60947-1 (2014-09) Ed. 5.2	Low-voltage switchgear and control gear – Part 1: General rules.	
Electrical engineering	VDE 0660 - 101 DIN EN 60947-2:2014-01 EN 60947-2:2013 IEC 60947-2 (2013-01) Ed. 4.2	Low-voltage switchgear and control gear – Part 2: Circuit-breakers.	
Electrical engineering	VDE 0660 - 107 DIN EN 60947-3:2015:03 EN 60947-3:2009 IEC 60947-3 (2012-09) Ed. 3.1	Low-voltage switchgear and control gear – Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units.	
Electrical engineering	VDE 0660 - 102 DIN EN 60947-4-1:2014-02 EN 60947-4-1:2012 IEC 60947-4-1 (2012-07) Ed. 3.1	Low-voltage switchgear and control gear – Part 4-1: Contactors and motor-starters – Electromechanical contactors and motor-starters.	
Electrical engineering	VDE 0660 - 117 DIN EN 60947-4-2:2013-05 EN 60947-4-2:2012 IEC 60947-4-2 (2012-03) Ed. 3.0	Low-voltage switchgear and control gear – Part 4-2: Contactors and motor-starters – AC semiconductor motor controllers and starters.	
Electrical engineering	VDE 0660 - 109 DIN EN 60947-4-3:2015-04 EN 60947-4-3:2014 IEC 60947-4-3 (2014-05) Ed. 2.0	Low-voltage switchgear and controlgear – Part 4-3: Contactors and motor-starters – AC semiconductor controllers and contactors for non-motor loads.	

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	VDE 0660 - 200 DIN EN 60947-5-1:2010-04 EN 60947-5-1:2009 IEC 60947-5-1 (2009-07) Ed. 3.1	Low-voltage switchgear and control gear – Part 5-1: Control circuit devices and switching elements – Electromechanical control circuit devices.	
Electrical engineering	VDE 0660 - 208 DIN EN 60947-5-2:2014-01 EN 60947-5-2:2012 IEC 60947-5-2 (2012-09) Ed. 3.1	Low-voltage switchgear and controlgear – Part 5-2: Control circuit devices and switching elements – Proximity switches.	
Electrical engineering	VDE 0660 - 210 DIN EN 60947-5-5:2005-11 EN 60947-5-5:2005 IEC 60947-5-5 (2005-04) Ed. 1.1	Low-voltage switchgear and controlgear – Part 5-5: Control circuit devices and switching elements – Electrical emergency stop device with mechanical latching function.	
Electrical engineering	VDE 0660 - 114 DIN EN 60947-6-1:2014-09 EN 60947-6-1:2014 IEC 60947-6-1 (2013-12) Ed. 2.1	Low-voltage switchgear and controlgear – Part 6-1: Multiple function equipment – Transfer switching equipment.	
Electrical engineering	VDE 0660 - 115 DIN EN 60947-6-2:2007-12 EN 60947-6-2:2007 IEC 60947-6-2 (2007-03) Ed. 2.1	Low-voltage switchgear and controlgear – Part 6-2: Multiple function equipment – Control and protective switching devices (or equipment) (CPS).	
Electrical engineering	VDE 0611 - 1 DIN EN 60947-7-1:2010-03 EN 60947-7-1:2009 IEC 60947-7-1 (2009-04) Ed. 3.0	Niederspannungsschaltgeräte – Teil 7.1: Hilfseinrichtungen: Reihenklemmen für Kupferleiter. Low-voltage switchgear and controlgear – Part 7-1: Ancillary equipment – Terminal blocks for copper conductors.	
Electrical engineering	VDE 0611 - 3 DIN EN 60947-7-2:2010-03 EN 60947-7-2:2009 IEC 60947-7-2 (2009-04) Ed. 3.0	Low-voltage switchgear and controlgear – Part 7-2: Ancillary equipment – Protective conductor terminal blocks for copper conductors.	
Electrical engineering	VDE 0611 - 4 DIN VDE 0611- 4:1991-02	Niederspannungsschaltgeräte; Mehrstöckige Verteiler-Reihenklemmen bis 6 mm^2	

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	VDE 0637 - 3 DIN EN 61095:2009-11 EN 61095:2009 IEC 61095 (2009-02) Ed. 2.0	Electromechanical contactors for household and similar purposes.	
Electrical engineering	VDE 0220-100 DIN EN 61238-1:2004-03 IEC 61238-1 (2003-05) Ed. 2.0	Compression and mechanical connectors for power cables for rated voltages up to 30 kV (Um = 36 kV) – Part 1: Test methods and requirements.	
Fuses			
Electrical engineering	DIN EN 60269-1:2015-05 IEC 60269-1 (2014-06) Ed. 4.2 VDE 0636-1	Low-voltage fuses – Part 1: General requirements	
Electrical engineering	DIN VDE 0636-2:2014-09 IEC 60269-2 (2013-07(Ed. 5.0 HD 60269-2:2013 VDE 0636-2	Low-voltage fuses – Part 2: Supplementary requirements for fuses for use by authorized persons (fuses mainly for industrial application) - Examples of standardized systems of fuses A to K	
Electrical engineering	DIN VDE 0636-3:2013-12 IEC 60269-3 (2013-01) Ed. 4.1 HD 60269-2:2013 VDE 0636-3	Low-voltage fuses – Part 3: Supplementary requirements for fuses for use by unskilled persons (fuses mainly for household or similar applications) - Examples of standardized systems of fuses A to F	
Electrical engineering	DIN EN 60269-4:2013-01 EN 60269-4:2012 IEC 60269-4 (2012-05) Ed. 5.1 VDE 0636-4	Low-voltage fuses – Part 4: Supplementary requirements for fuse-links for the protection of semiconductor devices	
Electrical engineering	DIN CLC 60269-5 IEC/TR 60269-5 (2014-03) Ed. 2.0 VDE 0636-5	Low-voltage fuses – Part 5: Guidance for the application of low-voltage fuses	
Electrical engineering	DIN EN 60269-6:2012-06 EN 60269-6:2011 IEC 60269-6 (2010-12) Ed. 1.0 + Cor. 1 VDE 0636-6	Low-voltage fuses – Part 6: Supplementary requirements for fuse-links for the protection of solar photovoltaic energy systems	

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	IEC 60127-1 (2015-02) Ed. 2.2	Miniature fuses – Part 1: Definitions for miniature fuses and general requirements for miniature fuse-links.	
Electrical engineering	IEC 60127-2 (2014-09) Ed. 3.0	Miniature fuses – Part 2: Cartridge fuse-links.	
Power Transformers and Reactors			
Electrical engineering	VDE 0532-76-1 DIN EN 60076-1:2012-03 EN 60076-1:2011 IEC 60076-1 (2011-04) Ed. 3.0	Power transformers – Part 1: General.	
Electrical engineering	VDE 0532-76-2 DIN EN 60076-2:2012-02 EN 60076-2:2011 IEC 60076-2 (2011-02) Ed. 3.0	Power transformers – Part 2: Temperature rise for liquid-immersed transformers.	
Electrical engineering	VDE 0532-76-5 DIN EN 60076-5:2007-01 EN 60076-5:2006 IEC 60076-5 (2006-02) Ed. 3.0	Power transformers – Part 5: Ability to withstand short circuit.	
Electrical engineering	VDE 0532-76-6 DIN EN 60076-6:2009-02 EN 60076-6:2008 IEC 60076-6 (2013-09) Ed. 1.0	Power transformers – Part 6: Reactors.	
Electrical engineering	VDE 0532-214-1 DIN EN 60214-1:2015-04 EN 60214-1:2014 IEC 60214-1 (2014-05) Ed. 2.0	Tap-changers – Part 1: Performance requirements and test methods.	
Electrical engineering	IEC 60353 (2002-04) Ed. 2.0	Line traps for a.c. power systems.	
Electrical Installation Material			
Electrical engineering	VDE 0220 -3	Kabelklemmen	
Electrical engineering	VDE 0603-1 DIN VDE 0603-1:1991-01	Installationskleinverteiler und Zählerplätze AC 400 V; Installationskleinverteiler und Zählerplätze.	

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Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	VDE 0603-2 DIN VDE 0603-2:1098-03	Installationskleinverteiler und Zählerplätze AC 400 V; Hauptleitungsabzweigklemmen.	
Electrical engineering	VDE 0609 -1 DIN EN 60999:2000-12 EN 60999:2000 IEC 60999 (1999-11) Ed. 2.0	Connecting devices – Electrical copper conductors – Safety requirements for screw-type and screwless-type clamping units – Part 1: General requirements and particular requirements for clamping units for conductors from 0,2 mm^2 up to 35 mm^2 (included).	
Electrical engineering	VDE 0623 -1 DIN EN 60309-1:2014-12 EN 60309-1:2005 IEC 60309-1 (2012-06) Ed. 4.2	Plugs, socket-outlets and couplers for industrial purposes – Part 1: General requirements.	
Electrical engineering	VDE 0604-202 DIN EN 61914:2010-01 IEC 61914 (2009-01) Ed. 1.0	Cable cleats for electrical installations.	
Electrical engineering	VDE 0623 -20 DIN EN 60309-2:2013-01 EN 60309-2:2012 IEC 60309-2 (2012-05) Ed. 4.2	Plugs, socket-outlets and couplers for industrial purposes – Part 2: Dimensional interchangeability requirements for pin and contact-tube accessories.	
Electrical engineering	VDE 0630 - 1 DIN EN 61058-1:2001-10 EN 61058-1:2008 IEC 61058-1 (2008-04) Ed. 3.2	Switches for appliances – Part 1: General requirements.	
Electrical engineering	VDE 0630 - 2-1 DIN EN 61058-2-1:2001-08 EN 61058-2-1:2011 IEC 61058-2-1 (2010-11) Ed. 2.0	Switches for appliances – Part 2-1: Particular requirements for cord switches.	
Electrical engineering	VDE 0640 DIN EN 62019:2006-01 EN 62019:2005 IEC 62019 (2003-01)	Electrical accessories – Circuit-breakers and similar equipment for household use – Auxiliary contact units.	

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	IEC 60898-1 (2015-03) Ed. 2.0 EN 60898-1 DIN EN 60898-1:2013 VDE 0641-1	Electrical accessories - Circuit-breakers for overcurrent protection for household and similar installations – Part 1: Circuit-breakers for a.c. operation	
Electrical engineering	IEC 60898-2 (2003-07) Ed. 1.1 EN 60898-2: 2007 DIN EN 60898-2:2007 VDE 0641-2	Circuit-breakers for overcurrent protection for household and similar installations – Part 2: Circuit-breakers for a.c. and d.c. operation	
Electrical engineering	IEC 60934 (2013-01) Ed. 3.2 DIN EN 60934:2013-11 VDE 0642	Circuit-breakers for equipment (CBE).	
Electrical engineering	IEC 61008-1 (2013-09) Ed. 3.2 DIN EN 61008-10:2015-11 VDE 0664-10	Residual current operated circuit-breakers without integral overcurrent protection for household and similar uses (RCCBs) – Part 1: General rules	
Electrical engineering	IEC 61008-2-1 (1990-12) Ed. 1.0 DIN EN 61008-2-11:1999-12 VDE 0664-2-11	Residual current operated circuit-breakers without integral overcurrent protection for household and similar uses (RCCB's). – Part 2-1: Applicability of the general rules to RCCB's functionally independent of line voltage	
Electrical engineering	IEC 61008-2-2 (1990-12) Ed. 1.0 DIN EN 61008-2-2 VDE 0664-2-2	Residual current operated circuit-breakers without integral overcurrent protection for household and similar uses (RCCB's). – Part 2-2: Applicability of the general rules to RCCB's functionally dependent on line voltage	
Electrical engineering	IEC 61009-1 (2013-09) Ed. 3.2 DIN EN 61009-20:2015-11 VDE 0664-20	Residual current operated circuit-breakers with integral overcurrent protection for household and similar uses (RCBOs) – Part 1: General rules	

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	IEC 61009-2-1 (1991-09) Ed. 1.0 DIN EN 61009-21:1999-12 VDE 0664-21	Residual current operated circuit-breakers with integral overcurrent protection for household and similar uses (RCBO's) – Part 2-1: Applicability of the general rules to RCBO's functionally independent of line voltage	
Electrical engineering	IEC 61009-2-2 (1991-09) Ed. 1.0 DIN EN 61009-2-2 VDE 0664-2-2	Residual current operated circuit-breakers with integral overcurrent protection for household and similar uses (RCBO's) – Part 2-2: Applicability of the general rules to RCBO's functionally dependent on line voltage	
Electrical engineering	IEC 60099-4 (2014-06) Ed. 3.0 DIN EN 60099-4:2015-07 VDE 0675-4	Surge arresters – Part 4: Metal-oxide surge arresters without gaps for a.c. systems	
Electrical engineering	IEC 60099-5 (2013-05) Ed. 2.0 DIN EN 60099-5:2014-09 VDE 0675-5	Surge arresters – Part 5: Selection and application recommendations	
Electrical engineering	IEC 60099-6 (2002-08) Ed. 1.0	Surge arresters – Part 6: Surge arresters containing both series and parallel gapped structures - Rated 52 kV and less	
Electrical engineering	IEC 60099-8 (2011-01) Ed. 1.0 DIN EN 60099-8:2011-11 VDE 0675-8	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	
Electrical engineering	IEC 60099-9 (2014-06) Ed. 1.0 DIN EN 60099-9:2015-08 VDE 0675-9	Surge arresters – Part 9: Metal-oxide surge arresters without gaps for HVDC converter stations	
Electrical engineering	IEC 61643-11 (2011-03) Ed. 1.0 DIN EN 61643-11/A1:2015-09 VDE 0675-6-11	Low-voltage surge protective devices – Part 11: Surge protective devices connected to low-voltage power systems - Requirements and test methods	

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	IEC 61643-12 (2008-11) Ed. 2.0 DIN EN 61643-12:2013-04 VDE 0675-6-12	Low-voltage surge protective devices – Part 12: Surge protective devices connected to low-voltage power distribution systems - Selection and application principles	
Electrical engineering	IEC 61643-21 (2012-07) Ed. 1.2	Low voltage surge protective devices – Part 21: Surge protective devices connected to telecommunications and signalling networks - Performance requirements and testing methods	
Electrical engineering	IEC 61643-22 (2015-06) Ed. 2.0	Low-voltage surge protective devices – Part 22: Surge protective devices connected to telecommunications and signalling net-works – Selection and application principles	
Electrical engineering	IEC 61643-311 (2013-04) Ed. 1.0	Components for low-voltage surge protective devices – Part 311: Performance requirements and test circuits for gas discharge tubes (GDT)	
Electrical engineering	IEC 61643-312 (2013-04) Ed. 1.0	Components for low-voltage surge protective devices – Part 312: Selection and application principles for gas discharge tubes	
Electrical engineering	IEC 61643-321 (2001-12) Ed. 1.0	Components for low-voltage surge protective devices – Part 321: Specifications for avalanche breakdown diode (ABD)	
Electrical engineering	IEC 61643-331 (2003-05) Ed. 1.0	Components for low-voltage surge protective devices – Part 331: Specification for metal oxide varistors (MOV)	
Electrical engineering	IEC 61643-341 (2001-11) Ed. 1.0	Components for low-voltage surge protective devices – Part 341: Specification for thyristor surge suppressors (TSS)	

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	VDE 0675-39-11 DIN EN 50539-11:2013-12 EN 50539-11:2013	Überspannungsschutzgeräte für Niederspannung - Überspannungsschutzgeräte für besondere Anwendungen einschließlich Gleichspannung – Teil 11: Anforderungen und Prüfungen für Überspannungsschutzgeräte für den Einsatz in Photovoltaik-Installationen.	
Low-voltage switchgear and controlgear assemblies			
Electrical engineering	IEC 61439-1 (2011-08) Ed. 2.0 DIN EN 61439-1:2014-06 VDE 0660-600-1	Low-voltage switchgear and controlgear assemblies – Part 1: General rules	
Electrical engineering	IEC 61439-2 (2011-08) Ed.2.0 DIN EN 61439-2:2012-06 VDE 0660-600-2	Low-voltage switchgear and controlgear assemblies – Part 2: Power switchgear and controlgear assemblies	
Electrical engineering	IEC 61439-3 (2012-02) Ed. 1.0 DIN EN 61439-3:2014-10 VDE 0660-600-3	Low-voltage switchgear and controlgear assemblies – Part 3: Distribution boards intended to be operated by ordinary persons (DBO)	
Electrical engineering	IEC 61439-4 (2012-11) Ed.1.0 DIN EN 61439-4:2013-09 VDE 0660-600-4	Low-voltage switchgear and controlgear assemblies – Part 4: Particular requirements for assemblies for construction sites (ACS)	
Electrical engineering	IEC 61439-5 (2015-03) Ed. 2.0 DIN EN 61439-5:2015-10 VDE 0660-600-5	Low-voltage switchgear and controlgear assemblies – Part 5: Assemblies for power distribution in public networks	
Electrical engineering	IEC 61439-6 (2012-05) Ed. 1.0 DIN EN 61439-6:2013-06 VDE 0660-600-6	Low-voltage switchgear and controlgear assemblies – Part 6: Busbar trunking systems (busways)	
Electrical engineering	IEC/TS 61439-7 (2014-02) Ed. 1.0 DIN EN 61439-7:2014-10 VDE 0660-600-7	Low-voltage switchgear and controlgear assemblies – Part 7: Assemblies for specific applications such as marinas, camping sites, market squares, electric vehicles charging stations	

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Switching, control and protective equipment			
Electrical engineering	VDE 0435 Teil 201 DIN EN 61810-1:2009-02 EN 61810-1:2008 IEC 61810-1 (2015-02) Ed. 4.0	Electromechanical elementary relays – Part 1: General and safety requirements.	
Electrical engineering	VDE 0435 - 300 DIN EN 60255-1:2010-09 EN 60255-1:2010 IEC 60255-1 (2009-08) Ed. 1.0	Measuring relays and protection equipment – Part 1: Common requirements.	
Electrical engineering	VDE 0435 - 2021 DIN EN 61812-1:2015-04 EN 61812-1:2011 IEC 61812-1 (2011-05) Ed. 2.0	Time relays for industrial and residential use – Part 1: Requirements and tests.	
Electrical engineering	VDE 0631-2-1 DIN EN 60730-2-1:2012-10 EN 60730-2-1:2010 IEC 60730-2-1 (2014-09) Ed. 5.0	Automatic electrical controls – Part 1: General requirements.	
Electrical engineering	VDE 0631 Teil 2-10 DIN EN 60730-2-10:2008-06 EN 60730-2-10:2007 IEC 60730-2-10 (2006-10)	Automatic electrical controls for household and similar use – Part 2-10: Particular requirements for motor-starting relays	
Instrument transformers			
Electrical engineering	VDE 0414-9-2 DIN EN 61869-2:2014-06 EN 61869-2:2012 IEC 61869-2 (2012-09) Ed. 2.0	Instrument transformers – Part 2: Additional requirements for current transformers.	
Electrical engineering	VDE 0414-9-3 DIN EN 61869-3:2012-05 EN 61869-3:2011 IEC 61869-3 (2011-07) Ed. 1.0	– Part 3: Additional requirements for inductive voltage transformers.	

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	VDE 414-9-4 HD 548.3 S1 DIN EN 61869-4:2015-04 EN 61869-4:2014 IEC 61869-4 (2013-11) Ed. 1.0	Instrument transformers – Part 4: Additional requirements for combined transformers.	
Low-voltage equipment			
Electrical engineering	VDE 0558-11 DIN EN 60146-1-1:2011-04 EN 60146-1-1:2010 IEC 60146-1-1 (2009-06) Ed. 4.0	Semiconductor converters – General requirements and line commutated converters – Part 1-1: Specification of basic requirements.	
Electrical engineering	VDE 0558 - 8 DIN EN 60146-1-3:1994-03 EN 60146-1-3:1993 IEC 60146-1-3 (1991-04) Ed. 3.0	Semiconductor convertors – General requirements and line commutated convertors – Part 1-3: Transformers and reactors.	
Electrical engineering	VDE 0638 DIN 57638:1981-09	Niederspannungs-Schaltgeräte - Schalter-Sicherungs-Einheiten D0-System.	

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ВЯРНО С
ОРИГИНАЛА

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Testing of high-voltage, medium-voltage and low-voltage cables and their accessories as described in the subsequent listed standards.			
Polyvinyl chloride insulated cables			
Electrical engineering	IEC 60227-1 (2007-10) Ed. 3.0	Polyvinyl chloride insulated cables of rated voltages up to and including 450 V / 750 V – Part 1: General requirements.	
Electrical engineering	IEC 60227-3 (1997-11) Ed. 2.1	Polyvinyl chloride insulated cables of rated voltages up to and including 450 V / 750 V – Part 3: Non-sheathed cables for fixed wiring.	
Electrical engineering	IEC 60227-4 (1997-12) Ed. 2.1	Polyvinyl chloride insulated cables of rated voltages up to and including 450 V / 750 V – Part 4: Sheathed cables for fixed wiring.	
Electrical engineering	IEC 60227-5 (2011-09) Ed. 3.0	Polyvinyl chloride insulated cables of rated voltages up to and including 450 V / 750 V – Part 5: Flexible cables (cords).	
Electrical engineering	IEC 60227-6 (2001-06) Ed. 3.0	Polyvinyl chloride insulated cables of rated voltages up to and including 450 V / 750 V – Part 6: Lift cables and cables for flexible connections.	
Electrical engineering	IEC 60227-7 (2012-01) Ed. 1.2	Polyvinyl chloride insulated cables of rated voltages up to and including 450 V / 750 V – Part 7: Flexible cables screened and unscreened with two or more conductors	
Electrical engineering	VDE 0281 - 8 DIN VDE 0281-8: 2000-09 HD 21.8 S2 + A1:1999	Polyvinylchlorid-isolierte Leitungen mit Nennspannungen bis 450 V / 750 V. Einadrige Leitungen ohne Mantel für Lichterketten.	
Electrical engineering	VDE 0281 - 9 DIN VDE 0281-9:2001-01 HD 21.9 S2 + A1:1999	Polyvinylchlorid-isolierte Leitungen mit Nennspannungen bis 450 V / 750 V. Einadrige Leitungen ohne Mantel zur Verlegung bei tiefen Temperaturen.	
Electrical engineering	VDE 0285-525-1 DIN EN 50525-1:2012-01 EN 50525-1:2011	Starkstromleitungen mit Nennspannungen bis 450 V / 750 V (U_0/U) – Teil 1: Allgemeine Anforderungen.	

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	VDE 0285-525-2-11 DIN EN 50525-2-11:2012-01 EN 50525-2-11:2011	– Flexible Leitungen mit thermoplastischer PVC-Isolierung.	
Electrical engineering	VDE 0285-525-2-12 DIN EN 50525-2-12:2012-01 EN 50525-2-12:2011	– Wendelleitungen mit thermoplastischer PVC-Isolierung.	
Electrical engineering	VDE 0285-525-2-21 DIN EN 50525-2-21:2012-01 EN 50525-2-21:2011	– Flexible Leitungen mit vernetzter Elastomer-Isolierung.	
Electrical engineering	VDE 0285-525-2-31 DIN EN 50525-2-31:2012-01 EN 50525-2-31:2011	– Ader und Verdrahtungsleitung mit thermoplastischer PVC-Isolierung.	
Electrical engineering	VDE 0285-525-2-41 DIN EN 50525-2-41:2012-01 EN 50525-2-41:2011	– Einadrige Leitung mit vernetzter Silicon-Isolierung.	
Electrical engineering	VDE 0285-525-2-42 DIN EN 50525-2-42:2012-01 EN 50525-2-42:2011	– Ader- und Verdrahtungsleitungen mit vernetzter EVA-Isolierung.	
Electrical engineering	VDE 0285-525-2-51 DIN EN 50525-2-51:2012-01 EN 50525-2-51:2011	– Ölbeständige Steuerleitung mit thermoplastischer PVC-Isolierung.	
Electrical engineering	VDE 0285-525-2-71 DIN EN 50525-2-71:2012-01 EN 50525-2-71:2011	– Lahnlitzen-Leitung mit thermoplastischer PVC-Isolierung.	
Electrical engineering	VDE 0285-525-2-72 DIN EN 50525-2-72:2012-01 EN 50525-2-72:2011	– Trennbare Zwillingsleitungen mit thermoplastischer PVC-Isolierung.	
Electrical engineering	VDE 0285-525-2-81 DIN EN 50525-2-81:2012-01 EN 50525-2-81:2011	– Lichtbogenschweißleitungen mit vernetzter Elstomer- Hülle.	
Electrical engineering	VDE 0285-525-2-82 DIN EN 50525-2-82:2012-01 EN 50525-2-82:2011	– Leitungen für Lichterketten mit vernetzter Elastomer-Isolierung.	

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	VDE 0285-525-2-83 DIN EN 50525-2-83:2012-01 EN 50525-2-83:2011	– Mehradrige Leitungen mit vernetzter Silicon-Isolierung.	
Electrical engineering	VDE 0285-525-3-11 DIN EN 50525-3-11:2012-01 EN 50525-3-11:2011	– Teil 3-11: Starkstromleitungen mit verbessertem Verhalten im Brandfall – Flexible halogenfreie, raucharme Leitungen mit thermoplastischer Isolierung.	
Electrical engineering	VDE 0285-525-3-21 DIN EN 50525-3-21:2012-01 EN 50525-3-21:2011	– Teil 3-21: Starkstromleitungen mit verbessertem Verhalten im Brandfall – Flexible halogenfreie, raucharme Leitungen mit vernetzter Isolierung.	
Electrical engineering	VDE 0285-525-3-31 DIN EN 50525-3-31:2012-01 EN 50525-3-31:2011	– Teil 3-31: Starkstromleitungen mit verbessertem Verhalten im Brandfall – Halogenfreie, raucharme Ader- und Verdraht-ungsleitungen mit thermoplastischer Isolierung.	
Electrical engineering	VDE 0285-525-3-41 DIN EN 50525-3-41:2012-01 EN 50525-3-41:2011	– Teil 4-31: Starkstromleitungen mit verbessertem Verhalten im Brandfall – Halogenfreie, raucharme Ader- und Verdrahtungsleitungen mit vernetzter Isolierung.	
Electrical engineering	VDE 0262 DIN VDE 0262:2004-01	Installationskabel mit Isolierungen aus vernetzten Polyethylen und Mantel aus thermoplastischem PVC mit Nennspannung 0,6 / 1 kV.	
Electrical engineering	DIN VDE 0276-603:2010-03 VDE 0276-603 HD 603:2007	Starkstromkabel – Teil 603: Energiekabel mit Nennspannung 0,6 / 1 kV.	
Electrical engineering	DIN VDE 0276-604:2008-02 VDE 0276-604 HD 604:2005	Starkstromkabel – Teil 603: Energiekabel mit Nennspannung 0,6 / 1 kV mit verbessertem Verhalten im Brandfall für Kraftwerke.	

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Test methodes			
Electrical engineering	IEC 60332-1-1 (2004-07) Ed. 1.0 IEC 60332-1-2 (2004-07) Ed. 1.0 IEC 60332-1-3 (2004-07) Ed. 1.0 DIN EN 60332 -1-1:2005-06 DIN EN 60332 -1-2:2005-06 DIN EN 60332 -1-3:2005-06 VDE 0482-332 -1-1 VDE 0482-332 -1-2 VDE 0482-332 -1-3	Tests on electric and optical fiber cables under fire conditions – 1-1 Test for vertical flame propagation for a single insulated wire or cable – Apparatus – 1-2 Procedure for 1 kW pre-mixed flame – 1-3 Procedure for determination of flaming droplets/particles. Prüfungen an Kabeln, isolierten Leitungen und Glasfaserkabeln im Brandfall.	
Electrical engineering	VDE 0432 - 1:2011-10	Hochspannungs-Prüftechnik Allgemeine Festlegungen zu Prüfbedingungen.	
Electrical engineering	VDE 0432 - 2:2011-10	Hochspannungs-Prüftechnik Messsysteme.	
Electrical engineering	VDE 0472 - 401 DIN 57472-401:1984-06	Prüfung an Kabel und isolierten Leitungen Außenmaße.	
Electrical engineering	VDE 0472 - 402 DIN 57472-402:1984-06	Prüfung an Kabel und isolierten Leitungen. Wanddicke sowie Dicke von Bewehrungsdrähten und –bändern.	
Electrical engineering	VDE 0472 -1 DIN VDE 0472 -1:1987-06	Prüfung an Kabel und isolierten Leitungen ; Allgemeines.	
Electrical engineering	VDE 0472 – 505:1983-04 DIN 57472-505	Prüfung an Kabel und isolierten Leitungen. Verlustfaktor, dielektrische Verlustzahl und Ableitung.	
Electrical engineering	VDE 0472 - 509 DIN VDE 0472-509:1986-10	Prüfung an Kabel und isolierten Leitungen. Spannungsfestigkeit bei Kabeln und Leitungen, isolierten Schaltdrähten und Schnüren für Fernmeldeanlagen.	
Electrical engineering	VDE 0472 - 512 DIN VDE 0472-512:1985-05	Prüfung an Kabel und isolierten Leitungen. Widerstand zwischen Schutzleiter und Leitschicht.	
Electrical engineering	VDE 0472 – 604:1985-05 DIN VDE 0472-604	Prüfung an Kabel und isolierten Leitungen Dichtheit von Kabelmänteln.	

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	VDE 0472 - 605 DIN VDE 0472-605:1985-01	Prüfung an Kabel und isolierten Leitungen Abrieb.	
Electrical engineering	DE 0472 - 613 DIN VDE 0472-613:1986-03	Prüfung an Kabel und isolierten Leitungen Weiterreißwiderstand.	
Electrical engineering	VDE 0472 - 626 DIN 57472-626:1983-01	Prüfung an Kabel und isolierten Leitungen Reißlänge.	
Electrical engineering	DIN EN 50497:2008-11 VDE 0473-497 EN 50497:2007	Empfohlenes Prüfverfahren zur Einschätzung des Risikos von Weichmacher-ausschwitzungen bei PVC-isolierten und –ummantelten Kabeln und Leitungen.	
Electrical engineering	VDE 0473-811-100 DIN EN 60811 – 100:2012-12 EN 60811 – 100:2008 IEC 60811 – 100 (2008-03) Ed. 1.0	Electric and optical fibre cables – Test methods for non-metallic materials – Part 100: General.	
Electrical engineering	VDE 0473-811-201 DIN EN 60811 – 201:2012-12 EN 60811 - 201 IEC 60811 – 201 (2012-03) Ed. 1.0	Electric and optical fibre cables – Test methods for non-metallic materials – Part 201: General tests – Measurement of insulation thickness.	
Electrical engineering	VDE 0473-811-202 DIN EN 60811 – 202:2012-12 EN 60811 - 202 IEC 60811 – 202 (2012-03) Ed. 1.0	Electric and optical fibre cables – Test methods for non-metallic materials – Part 202: General tests – Measurement of thickness of non-metallic sheath.	
Electrical engineering	VDE 0473-811-203 DIN EN 60811 – 203:2012-12 EN 60811 - 203 IEC 60811 – 203 (2012-03) Ed. 1.0	Messung der Außenmaße.	
Electrical engineering	VDE 0473-811-301 DIN EN 60811 - 301:2012-12 EN 60811 - 301 IEC 60811 – 301 (2012-03) Ed. 1.0	Electric and optical fibre cables – Test methods for non-metallic materials – Part 301: Electrical tests – Measurement of the permittivity at 23 °C of filling compounds	

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	VDE 0473-811-302 DIN EN 60811 - 302:2012-12 EN 60811 - 302 IEC 60811 – 302 (2012-03) Ed. 1.0	Electric and optical fibre cables – Test methods for non-metallic materials – Part 302: Electrical tests – Measurement of the d.c. resistivity at 23 °C and 100 °C of filling.	
Electrical engineering	VDE 0473-811-401 DIN EN 60811 - 401:2012-12 EN 60811 - 401 IEC 60811 – 401 (2012-03) Ed. 1.0	Electric and optical fibre cables – Test methods for non-metallic materials – Part 401: Miscellaneous tests – Thermal ageing methods – Ageing in an air oven.	
Electrical engineering	VDE 0473-811-402 DIN EN 60811 - 402:2012-12 EN 60811 - 402 IEC 60811 – 402 (2012-03) Ed. 1.0	Electric and optical fibre cables – Test methods for non-metallic materials – Part 402: Miscellaneous tests – Water absorption tests.	
Electrical engineering	VDE 0473-811-404 DIN EN 60811 - 404:2012-12 EN 60811 - 404 IEC 60811 – 404 (2012-03) Ed. 1.0	Electric and optical fibre cables – Test methods for non-metallic materials – Part 404: Miscellaneous tests – Mineral oil immersion tests for sheaths.	
Electrical engineering	VDE 0473-811-405 DIN EN 60811 - 405:2012-12 EN 60811 - 405 IEC 60811 – 405 (2012-03) Ed. 1.0	Electric and optical fibre cables – Test methods for non-metallic materials – Part 405: Miscellaneous tests – Thermal stability test for PVC insulations and PVC sheaths.	
Electrical engineering	VDE 0473-811-406 DIN EN 60811 - 406:2012-12 EN 60811 - 406 IEC 60811 – 406 (2012-03) Ed. 1.0	Electric and optical fibre cables – Test methods for non-metallic materials – Part 406: Miscellaneous tests – Resistance to stress cracking of polyethylene and polypropylene compounds.	
Electrical engineering	VDE 0473-811-407 DIN EN 60811 - 407:2012-12 EN 60811 - 407 IEC 60811 – 407 (2012-03) Ed. 1.0	Electric and optical fibre cables – Test methods for non-metallic materials – Part 407: Miscellaneous tests – Measurement of mass increase of polyethylene and polypropylene compounds.	

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	VDE 0473-811-408 DIN EN 60811 - 408:2012-12 EN 60811 - 408 IEC 60811 – 408 (2012-03) Ed. 1.0	Electric and optical fibre cables – Test methods for non-metallic materials – Part 408: Miscellaneous tests – Long-term stability test of polyethylene and polypropylene compounds.	
Electrical engineering	VDE 0473-811-409 DIN EN 60811 - 409:2012-12 EN 60811 - 409 IEC 60811 – 409 (2012-03) Ed. 1.0	Electric and optical fibre cables – Test methods for non-metallic materials – Part 409: Miscellaneous tests – Loss of mass test for thermoplastic insulations and sheaths.	
Electrical engineering	VDE 0473-811-501 DIN EN 60811 - 501:2012-12 EN 60811 - 501 IEC 60811 – 501 (2012-03) Ed. 1.0	Electric and optical fibre cables – Test methods for non-metallic materials – Part 501: Mechanical tests – Tests for determining the mechanical properties of insulating and sheathing compounds.	
Electrical engineering	VDE 0473-811-502 DIN EN 60811 - 502:2012-12 EN 60811 - 502 IEC 60811 – 502 (2012-03) Ed. 1.0	Electric and optical fibre cables – Test methods for non-metallic materials – Part 502: Mechanical tests – Shrinkage test for insulations.	
Electrical engineering	VDE 0473-811-503 DIN EN 60811 - 503:2012-12 EN 60811 - 503 IEC 60811 – 503 (2012-03) Ed. 1.0	Electric and optical fibre cables – Test methods for non-metallic materials – Part 503: Mechanical tests – Shrinkage test for sheaths.	
Electrical engineering	VDE 0473-811-504 DIN EN 60811 - 504:2012-12 EN 60811 - 504 IEC 60811 – 504 (2012-03) Ed. 1.0	Electric and optical fibre cables – Test methods for non-metallic materials – Part 504: Mechanical tests – Bending tests at low temperature for insulation and sheaths.	
Electrical engineering	VDE 0473-811-505 DIN EN 60811 - 505:2012-12 EN 60811 - 505 IEC 60811 – 505 (2012-03) Ed. 1.0	Electric and optical fibre cables – Test methods for non-metallic materials – Part 505: Mechanical tests – Elongation at low temperature for insulations and sheaths.	

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	VDE 0473-811-506 DIN EN 60811 - 506:2012-12 EN 60811 - 506 IEC 60811 – 506 (2012-03) Ed. 1.0	Schlagprüfung bei niedrigen Temperaturen für Isolierhüllen und Mäntel. Electric and optical fibre cables – Test methods for non-metallic materials – Part 506: Mechanical tests – Impact test at low temperature for insulations and sheaths.	
Electrical engineering	VDE 0473-811-507 DIN EN 60811 - 507:2012-12 EN 60811 - 507 IEC 60811 – 507 (2012-03) Ed. 1.0	Electric and optical fibre cables – Test methods for non-metallic materials – Part 507: Mechanical tests – Hot set test for cross-linked materials.	
Electrical engineering	VDE 0473-811-508 DIN EN 60811 - 508:2012-12 EN 60811 - 508 IEC 60811 – 508 (2012-03) Ed. 1.0	Electric and optical fibre cables – Test methods for non-metallic materials – Part 508: Mechanical tests – Pressure test at high temperature for insulation and sheaths.	
Electrical engineering	VDE 0473-811-509 DIN EN 60811 - 509:2012-12 EN 60811 - 509 IEC 60811 – 509 (2012-03) Ed. 1.0	Electric and optical fibre cables – Test methods for non-metallic materials – Part 509: Mechanical tests – Test for resistance of insulations and sheaths to cracking (heat shock test).	
Electrical engineering	VDE 0473-811-512 DIN EN 60811 - 512:2012-12 EN 60811 - 512 IEC 60811 – 512 (2012-03) Ed. 1.0	Electric and optical fibre cables – Test methods for non-metallic materials – Part 512: Mechanical tests – Methods specific to polyethylene and polypropylene compounds – Tensile strength and elongation at break after conditioning at elevated temperature.	
Electrical engineering	VDE 0473-811-513 DIN EN 60811 - 513:2012-12 EN 60811 - 513 IEC 60811 – 513 (2012-03) Ed. 1.0	Electric and optical fibre cables – Test methods for non-metallic materials – Part 513: Mechanical tests – Methods specific to polyethylene and polypropylene compounds – Wrapping test after conditioning.	

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Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	VDE 0473-811-605 DIN EN 60811 - 605:2012-12 EN 60811 - 605 IEC 60811 – 605 (2012-03) Ed. 1.0	Electric and optical fibre cables – Test methods for non-metallic materials – Part 605: Physical tests – Measurement of carbon black and/or mineral filler in polyethylene compounds.	
Electrical engineering	VDE 0473-811-606 DIN EN 60811 - 606:2012-12 EN 60811 - 606 IEC 60811 – 606 (2012-03) Ed. 1.0	Electric and optical fibre cables – Test methods for non-metallic materials – Part 606: Physical tests – Methods for determining the density.	
Accessories for power cables with rated voltages up to 30 kV			
Electrical engineering	DIN EN 61442:2006-01 VDE 0278-442 EN 61442:2005 IEC 61442 (2005-03) Ed. 2.0	Test methods for accessories for power cables with rated voltages from 6 kV (Um = 7,2 kV) up to 30 kV (Um = 36 kV).	
Electrical engineering	VDE 0278 - 629-1 DIN VDE 0278-629-1:2009-07 HD 629.1:2008	Prüfanforderungen für Kabelgarnituren für extrudierte Kunststoffkabel mit einer Nennspannung von 3,6 / 6 (7,2) kV bis 20,8 / 36 (42) kV, – Teil 1: Kabel mit extrudierter Kunststoffisolierung.	
Electrical engineering	VDE 0278 - 629-2 DIN VDE 0278-629-2:2009-07 HD 629.2:2008	Prüfanforderungen für Kabelgarnituren für extrudierte Kunststoffkabel mit einer Nennspannung von 3,6 / 6 (7,2) kV bis 20,8 / 36 (42) kV, – Teil 2: Kabel mit massegetränkter Papierisolierung.	
Electrical engineering	VDE 0279 DIN 57279:1982-10	Leitungs-Garnituren des Bergbaus unter Tage Muffen (U_0/U) = 0,6 / 1 kV.	
Electrical engineering	DIN EN 61238-1:2004-03 VDE 0220-100 IEC 61238-1 (2003-05) Ed. 2.0	Compression and mechanical connectors for power cables for rated voltages up to 30 kV (Um = 36 kV) – Part 1: Test methods and requirements.	
Electrical engineering	DIN V 47640	Verbindungsmuffen aus wärmeschrumpfendem Kunststoffschlauch für Kunststoffisolierte Starkstromkabel mit Nennspannung 0,6 / 1 (1,2) kV.	

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Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Power cables and Accessories for power cables with rated voltages up to 400 kV (Um ≤ 420 kV)			
Electrical engineering	DIN VDE 0276–632:1999-05 HD 632 S1:1996	Kabel mit Isolierung aus vernetztem Polyethylen und ihre Garnituren für Nennspannung von 30 bis 150 kV.	
Electrical engineering	DIN VDE 0276–633:1999-05 HD 633 S1:1997	Niederdruck Ölkabel und ihre Garnituren für Nennspannungen bis 220 kV.	
Electrical engineering	DIN VDE 0276 – 634:1999-05 HD 634 S1:1997	Gasinnendruckkabel und ihre Garnituren für Nennspannungen bis 220 kV.	
Electrical engineering	DIN VDE 0276 – 635:1999-05 HD 635 S1:1997	Gasaußendruckkabel und ihre Garnituren für Nennspannungen bis 220 kV.	
Electrical engineering	VDE 0265 DIN VDE 0265:1995-12	Kabel mit Kunststoffisolierung und Bleimantel für Starkstromanlagen.	
Electrical engineering	VDE 0266 DIN VDE 0266:2006-03	Starkstromkabel mit verbessertem Verhalten im Brandfall.	
Electrical engineering	VDE 0271 DIN VDE 0271:2008-02	Kabel; Starkstromkabel mit Isolierung und Mantel aus thermoplastischem PVC und Nennspannungen bis Uo/U (Um): 3,6 / 6 (7,2) kV.	
Electrical engineering	VDE 0276 - 605 DIN VDE 0276-605:2008-02	Starkstromkabel Ergänzende Prüfverfahren.	
Electrical engineering	VDE 0276 - 620 DIN VDE 0276-620:2010-11	Energieverteilungskabel mit extrudierter Isolierung für Nennspannungen Uo/U: 3,6 / 6 kV bis 20,8 / 36 kV.	
Electrical engineering	VDE 0276 - 621 DIN VDE 0276-621:1997-05	Energieverteilungskabel mit getränkter Papierisolierung für Mittelspannung.	
Electrical engineering	VDE 0276 - 622 DIN VDE 0276-622:2006-05	Starkstromkabel mit Nennspannungen von3,6 / 6 (7,2) kV bis 20,8 / 36 (42) kV mit verbessertem Verhalten im Brandfall für Kraftwerke.	
Electrical engineering	VDE 0276 - 626 DIN VDE 0276-626:1997-01	Isolierte Freileitungsseile für oberirdische Verteilungsnetze mit Nennspannung Uo/U (Um): 0,6 / 1 (1,2) kV.	
Electrical engineering	VDE 0276 - 627 DIN VDE 0276-627:2006-09	Vieladrige und vielpaarige Kabel für die Verlegung in Luft und in Erde.	

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	VDE 0279 DIN 50279:1982-10	Leitungsgarnituren des Bergbaus unter Tage, Muffen 1 kV.	
Electrical engineering	VDE 0278-393 DIN EN 50393:2006-11 EN 50393:2006	Prüfverfahren und Prüfanforderungen für die Garnituren von Verteilerkabeln mit Nennspannung von 0,6 / 1,0 (1,2) kV.	
Electrical engineering	IEC 60141-1 (1998-08) Ed. 3.0	Tests on oil-filled and gas-pressure cables and their accessories – Part 1: Oil-filled, paper-insulated, metal-sheathed cables and accessories for alternating voltages up to and including 400 kV.	
Electrical engineering	IEC 60141-2 (1967-01) Ed. 1.0	Tests on oil-filled and gas-pressure cables and their accessories. – Part 2: Internal gas-pressure cables and accessories for alternating voltages up to 275 kV.	
Electrical engineering	IEC 60141-3 (1967-01) Ed. 1.0	Tests on oil-filled and gas-pressure cables and their accessories. – Part 3: External gas-pressure (gas compression) cables and accessories for alternating voltages up to 275 kV.	
Electrical engineering	IEC 60141-4 (1990-10) Ed. 1.0	Tests on oil-filled and gas-pressure cables and their accessories. – Part 4: Oil-impregnated paper-insulated high pressure oil-filled pipe-type cables and accessories for alternating voltages up to and including 400 kV.	
Electrical engineering	IEC 60840 (2011-11) Ed. 4.0	Tests for power cables with extruded insulation for rated voltages above 30 kV (Um = 36 kV) up to 150 kV (Um = 170 kV).	
Electrical engineering	IEC 60055-1 (2005-05) Ed. 5.1	Paper-insulated metal-sheathed cables for rated voltages up to 18 / 30 kV (with copper or aluminum conductors and excluding gas-pressure and oil-filled cables) – Part 1: Tests on cables and their accessories.	

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	IEC 60055-2 (2005-02) Ed. 1.0	Paper-insulated metal-sheathed cables for rated voltages up to 18 / 30 kV (with copper or aluminium conductors and excludeing gaspressure and oil-filled cables). – Part 2: General and construction requirements.	
Electrical engineering	EC 60502-1 (2009-09) Ed. 2.0	Power cables with extruded insulation and their accessories for rated voltages from 1 kV (Um = 1,2 kV) up to 30 kV (Um = 36 kV) – Part 1: Cables for rated voltages of 1 kV (Um = 1,2 kV) and 3 kV (Um = 3,6 kV).	
Electrical engineering	IEC 60502-2 (2014-02) Ed. 2.0	Power cables with extruded insulation and their accessories for rated voltages from 1 kV (Um = 1,2 kV) up to 30 kV (Um = 36 kV) – Part 2: Cables for rated voltages from 6 kV (Um = 7,2 kV) up to 30 kV (Um = 36 kV.	
Electrical engineering	IEC 60502-4 (2010-12) Ed. 3.0	Power cables with extruded insulation and their accessories for rated voltages from 1 kV (Um = 1,2 kV) up to 30 kV (Um = 36 kV) – Part 4: Test requirements on accessories for cables with rated voltages from 6 kV (Um = 7,2 kV) up to 30 kV (Um = 36 kV).	
Electrical engineering	VDE 0276-2067 DIN IEC 62067:2013-08 IEC 62067 (2011-11) Ed. 2.0	Starkstromkabel mit extrudierter Isolierung und ihre Garnituren für Nennspannungen über 150 kV (Um = 170 kV) bis einschließlich 500 kV (Um = 550 kV) – Prüfverfahren und Anforderungen. Power cables with extruded insulation and their accessories for rated voltage above 150 kV (Um = 170 kV) up to 500 kV (Um = 550 kV) – Test methods and requirements.	
Electrical engineering	IEC 60227-2 (2003-04) Ed. 2.1	Electrical test methods for electric cables. – Part 1: Electrical tests for cables, cords and wires for voltages up to and including 450 V / 750 V.	
Electrical engineering	VDE 0481 - 885-2 DIN EN 60885-2 IEC 60885-2 (1987-03) Ed. 1.0	Prüfung an Kabeln und isolierten Leitungen; Teilentladung. Electrical test methods for electric cables. – Part 2: Partial discharge tests.	

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	VDE 0481 - 885-3 DIN EN 60885-3 IEC 60885-3 (2015-04) Ed. 2.0	Prüfung an Kabeln und isolierten Leitungen; Teilentladung an extrudierten Kabellängen. Electrical test methods for electric cables. – Part 3: Test methods for partial discharge measurements on lengths of extruded power cables.	
Electrical engineering	VDE 0473-229 DIN EN 60229:2009-04 EN 60229:2008 IEC 60229 (2007-10) Ed. 3.0	Tests on cable oversheaths which have a special protective function and are applied by extrusion.	
Electrical engineering	VDE 0481-395 DIN EN 50395:2006-07 EN 50395:2005	Elektrische Prüfung für Niederspannungskabel und -leitungen.	
Electrical engineering	VDE 0473-396 DIN EN 50396:2006-07 EN 50396:2005	Nicht-elektrische Prüfverfahren für Niederspannungskabel und -leitungen.	
Electrical engineering	VDE 0481 - 230 DIN EN 60230:2003-03 EN 60230:2002 IEC 60230 (1966-01) Ed. 1.0	Impulse tests on cables and their accessories.	
Electrical engineering	IEEE 48:2009	IEEE Standard for Test Procedures and Requirements for Alternating-Current Cable Terminations Used on Shielded Cables Having Laminated Insulation Rated 2.5 kV through 765 kV or Extruded Insulation Rated 2.5 kV through 500 kV.	
Electrical engineering	IEEE 404:2012	IEEE Standard for Extruded and Laminated Dielectric Shielded Cable Joints Rated 2500 V to 500.000 V.	
Electrical engineering	IEEE 386:2006	IEEE Standard for Separable Insulated Connector Systems for Power Distribution Systems Above 600 V.	

Testing field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure (Deviations / Modifications of Standard)	Test Range / Restrictions
Electrical engineering	IEEE 592:2007	IEEE Standard for Exposed Semiconducting Shields on High-Voltage Cable Joints and Separable Connectors.	

Technical responsibility for the test reports:

Approval:

Herr Dipl.-Wirt.-Ing. Rainer Schiller
Herr Dipl.-Ing. Hannes Zinnbauer
Herr Dipl.-Ing. Detlef Jegust

Technical verification:

Herr Dipl.-Ing. Winfried Moritz
Herr Dipl.-Ing. Klaus Vaterrodt
Herr Dipl.-Ing. Jürgen Wittwer
Herr Dipl.-Ing. Detlef Jegust
Herr Dipl.-Ing. Uwe Fischer
Herr Dipl.-Ing. Michael Scheide
Herr Dipl.-Ing. Matthias Schröder-Heske
Herr Dipl.-Ing. Carlos Pereira
Herr Dipl.-Ing. Martin Brüggemann
Herr Ronny Baumgart

Приложение 3.5

ДЕКЛАРАЦИЯ

че предложеното оборудване в процедурата отговаря на минималните технически изисквания на Възложителя

Аз, долуподписаният Стоил Колев Стоилов, в качеството ми на представляващ „Старт-Инженеринг“ АД, участник в открита процедура за възлагане на обществена поръчка с реф. № PPD18-103 и предмет: “Модернизация (ретрофит) на възлови разпределителни станции 20 (10) kV и изграждане на вериги на телемеханика“,

ДЕКЛАРИРАМ ЧЕ:

1. Предложеното от нас оборудване в процедурата за позиция „Напреженов измервателен трансформатор 24 kV, еднополюсен, с две вторични намотки, за монтиране на закрито“ отговаря на минималните технически изисквания на Възложителя, посочени в таблица 3.
2. Доставяните от нас материали, апаратура, оборудване и съоръжения отговарят на посочените от възложителя в документацията за участие стандарти за изпълнение на поръчката.
3. Предложените от нас материали, апаратура, оборудване и съоръжения са с технически характеристики и показатели, които съответстват на техническите характеристики и показатели, посочени от възложителя за изпълнение на поръчката в документацията за участие.

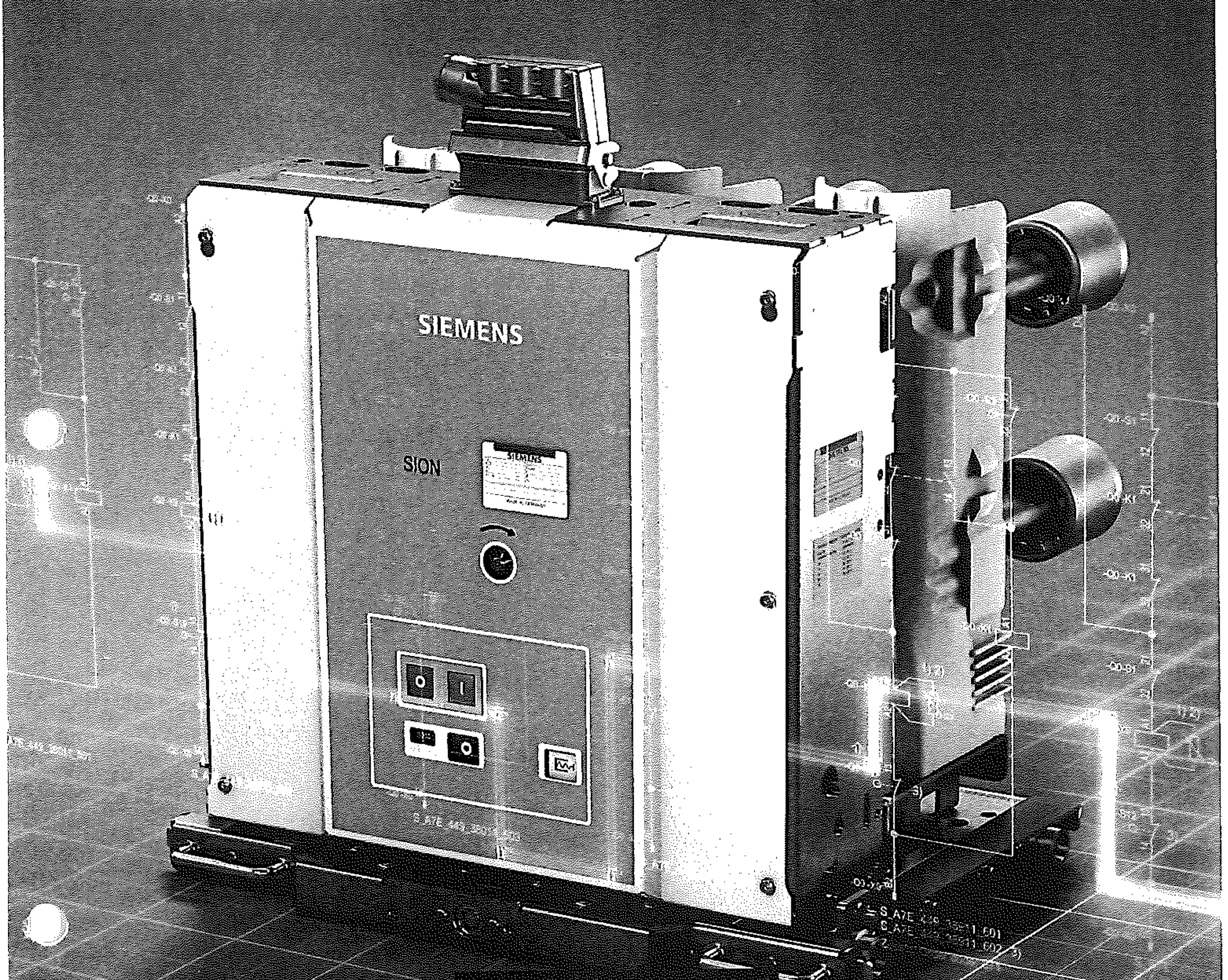
Информиран съм, че Възложителят (включително чрез неговия помощен орган, а именно назначената за провеждане на поръчката оценителна комисия) ще обработва и съхранява личните ми данни, посочени в настоящата декларация, за целите на провеждане на обществената поръчка, като за целта ще предприеме всички необходими според действащата нормативна уредба мерки за защита на личните ми данни.

Дата 17.12.2018 г.

ПОДПИС и ПЕЧАТ: На основание чл.36а ал.3 от ЗОП

Председател на Съвета на директорите
на „Старт-Инженеринг“ АД

SIEMENS



Totally Integrated Power – SION

SION Vacuum Circuit Breakers 3AE5 and 3AE1

Medium-Voltage Equipment

siemens.com/SION

Catalog
HG 11.02

Edition
2018

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SION Vacuum Circuit Breakers 3AE5 and 3AE1

Medium-Voltage Equipment
Catalog HG 11.02 · 2018

Supersedes:
Catalog HG 11.02 · 2017

TYPE APPROVED PRODUCT
DNV·GL
DNVGL.COM/AF

MANAGEMENT SYSTEM CERTIFICATION
DNV·GL
ISO 9001 = ISO 14001
OHSAS 18001

The products and systems listed in this catalog are manufactured and distributed using a certified management system (according to ISO 9001, ISO 14001 and BS OHSAS 18001).

Contents

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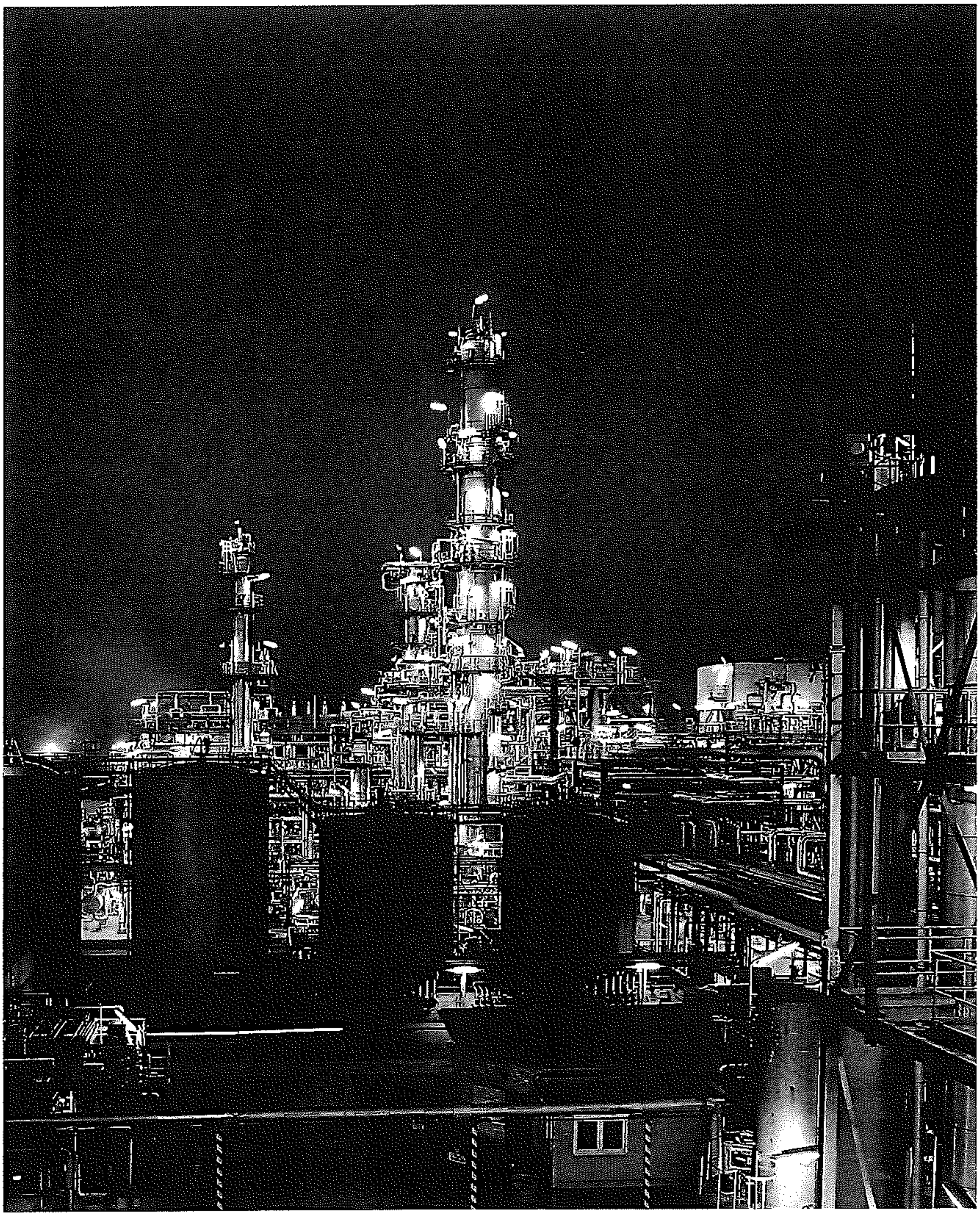
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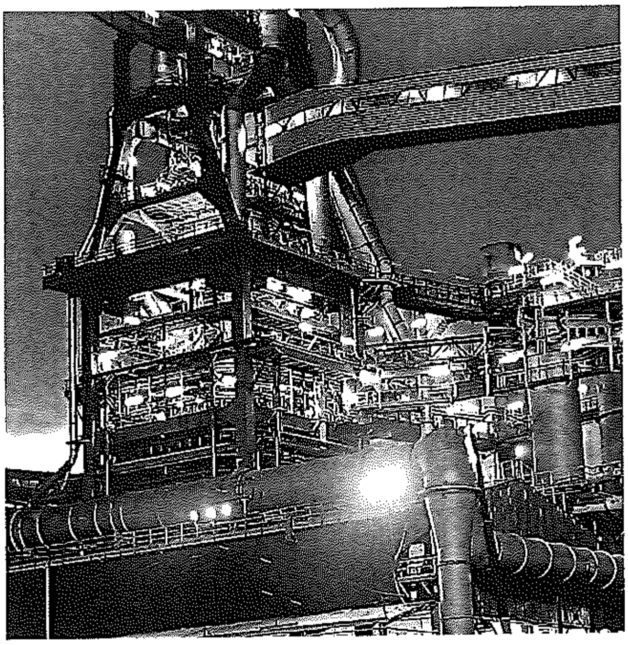

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Industrial application: Refinery

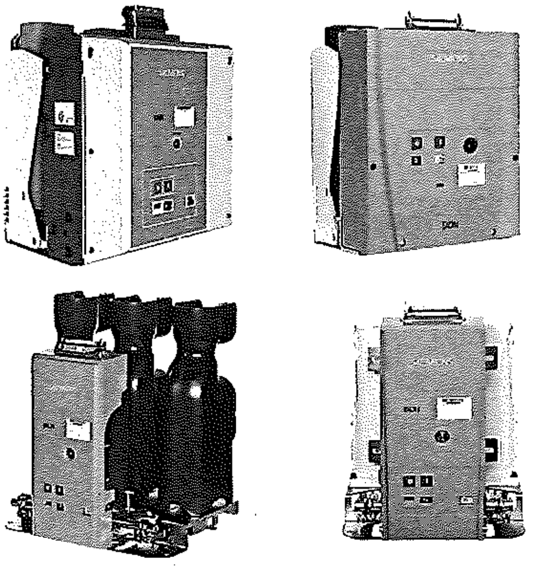
Contents Page

SION Vacuum Circuit Breaker 3AE5 and 3AE1 from 7.2 kV to 24 kV – The Modular Devices

SION vacuum circuit breakers control all switching operations in medium-voltage distribution systems and are suitable for installation in all established and new air-insulated medium-voltage switchgear as well as for retrofitting existing switchgear.
They are used for operation, for example, of overhead lines, cables, transformers, capacitors and motors.
The optional installation accessories enable easy integration into switchgear panels, and, maximally equipped as a withdrawable module with an earthing switch, form almost the complete circuit breaker compartment inside the switchgear.

Our comprehensive range of circuit breakers offers a wide selection of pole-center distances and widths across flats as well as various equipment options for voltage levels from 7.2 kV to 24 kV. The withdrawable part, contact arms, contacts and bushings enable easy integration in all customary medium-voltage switchgear types. Identical dimensions and connection dimensions across several voltage levels reduce planning costs and the variety of panel versions. High reliability and availability are a matter of course, as are 10,000 maintenance-free operating cycles.

SION vacuum circuit breaker for fixed mounting



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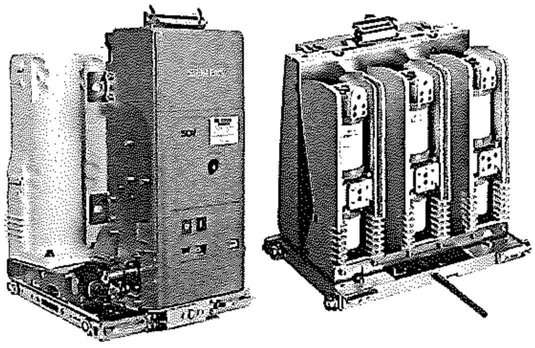
Thanks to a range of equipment options, SION vacuum circuit breakers can be precisely tailored to your requirements. This switching device can be mounted on a withdrawable part. Furthermore, mountable contact arms, contacts and bushings allow easy integration in your switchgear.

SION vacuum circuit breaker on withdrawable part



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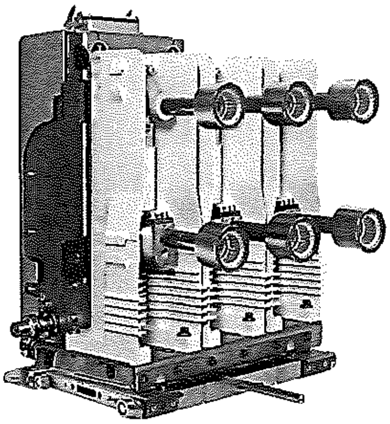
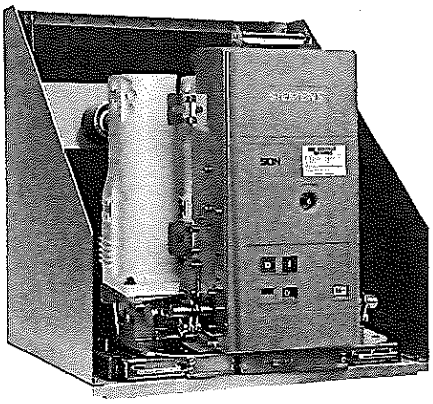
The circuit breaker mounted on a withdrawable part can be supplied both with and without contact arms and contacts.

SION vacuum circuit breaker on withdrawable part – with contacts



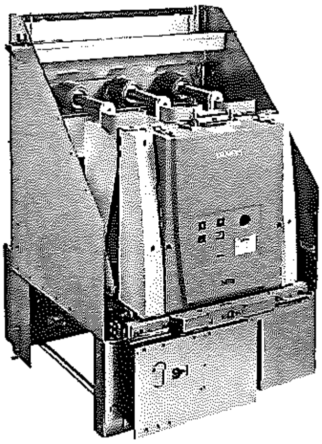
The SION vacuum circuit breakers can be supplied with contact arms and contacts.

Withdrawable module with 3AE5 vacuum circuit breaker



The withdrawable module contains all components required for the circuit breaker compartment of a switchgear panel. It consists of the circuit breaker mounted on a withdrawable part, with contact arms, fitted in a cartridge with side and rear walls. The withdrawable module is equipped with bushings, fixed contacts, shutters and the shutter mechanism. The side and rear walls form the tested connection compartment.

Withdrawable module with earthing switch



The withdrawable module is also available with an earthing switch. It contains all components required for the circuit breaker compartment of a switchgear panel. It consists of the circuit breaker mounted on a withdrawable part, with contact arms, fitted in a cartridge with side and rear walls. The withdrawable module is equipped with bushings, fixed contacts, shutters and the shutter mechanism, as well as with a make-proof earthing switch. The side and rear walls form the tested connection compartment.

Switching medium

Proven and fully developed for more than 40 years, vacuum switching technology is the principal arc-quenching element used in vacuum interrupters.

Pole assemblies

The pole assemblies consist of vacuum interrupters and pole shells. The vacuum interrupters are air-insulated and freely accessible. The pole assemblies are fixed on the mechanism mounting plate and supported by means of the pole shell (6). The vacuum interrupter (5) is mounted rigidly to the upper interrupter support. The lower part of the interrupter is guided into the lower interrupter support, allowing axial movement. The pole shell (6) absorbs external forces resulting from switching operations and the contact pressure.

Operating mechanism

The whole operating mechanism with motor (13), releases (11), indicators and actuating devices is mounted on the mechanism mounting plate (9). This compact design enables very fast operating times.

The circuit breaker operating mechanism is a stored-energy spring mechanism. The force is transmitted from the operating mechanism to the pole assemblies via operating levers. The closing spring (15) can be charged either electrically or manually, and latches in automatically when charging is complete. The closing spring (15) acts as a stored-energy mechanism.

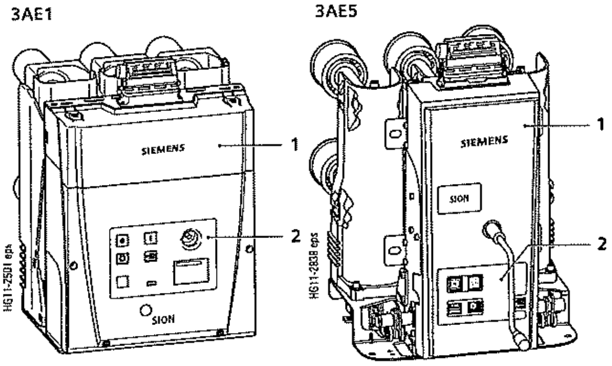
To close the breaker, the closing spring (15) can be unlatched either mechanically at the device (ON pushbutton), or electrically by remote control. The closing spring (15) charges the opening and/or contact-pressure springs (17) as the breaker closes. The now discharged closing spring (15) will be charged again automatically by the motor (13).

In this way, the stored-energy mechanism stores the OPEN – CLOSE – OPEN operating sequence that is required for an auto-reclosing operation on the system side. All stored-energy mechanisms perform the switching duties of synchronizing, rapid load transfer, and auto-reclosing.

Trip-free mechanism

The circuit breakers have a trip-free mechanism. In the event of an opening command being given after a closing operation has been initiated, the moving contacts return to the open position and remain there even if the closing command is sustained. However, the vacuum circuit breaker contacts are momentarily in the closed position.

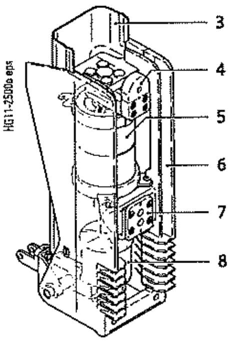
For charging the closing spring (15), the motor (13) operates in short-time duty. Therefore the voltage and power consumption might differ from the data of the motor rating plate.



Front view

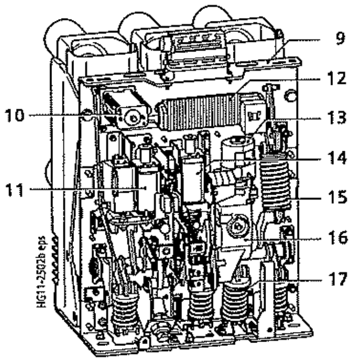
1 Cover of low-voltage interface

2 Central control board



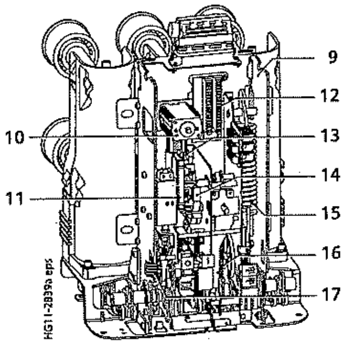
Pole structure

3 Insulating shell to the operating mechanism
4 Upper connection
5 Vacuum interrupter
6 Pole shell
7 Lower connection
8 Insulator



Operating mechanism 3AE1 without cover

9 Mechanism mounting plate
10 Auxiliary switch
11 1st release
12 Terminal strip
13 Motor
14 Closing solenoid
15 Closing spring
16 Gear
17 Opening spring



Operating mechanism 3AE5 without cover

9 Mechanism mounting plate
10 Auxiliary switch
11 1st release
12 Terminal strip
13 Motor
14 Closing solenoid
15 Closing spring
16 Gear
17 Opening spring

Releases

A release is a device that transfers electrical commands from an external source, such as a control room, to the latching mechanism of the vacuum circuit breaker so that it can be opened or closed. The releases are designed for short-time duty up to 1 minute and are reset internally.
The various types of releases available are described in detail below:

Closing solenoid

The closing solenoid unlatches the charged closing spring of the vacuum circuit breaker, closing it by electrical means.

Shunt releases

Shunt releases are used for automatic tripping of the circuit breaker by suitable protection relays and for deliberate tripping by electrical means. They are intended for connection to an external power supply (DC or AC voltage).

Current-transformer-operated releases

Current-transformer-operated releases consist of a stored energy mechanism, an unlatching mechanism and an electromagnet system. They are used when there is no external source of auxiliary power (e.g. a battery). Tripping is effected by means of a protection relay (e.g. overcurrent time protection) acting on the current-transformer-operated release.

Undervoltage releases

Undervoltage releases consist of a stored-energy mechanism, an unlatching mechanism and an electromagnet system that is permanently connected to the secondary or auxiliary voltage while the circuit breaker is closed. If the voltage falls below a predetermined value, unlatching of the release is enabled and the circuit breaker is opened via the stored-energy mechanism.

A maximum of two releases can be fitted as described on page 36. The consumption data of the releases is listed on page 87/88.

Closing and anti-pumping

In the standard version, the circuit breakers can be closed electrically via remote. In addition, they can be mechanically closed locally by direct unlatching of the closing spring. If constant electrical signals for CLOSE and OPEN commands are present at the circuit breaker at the same time, the circuit breaker will carry out an OPEN-CLOSE-OPEN or a CLOSE-OPEN operating sequence. A new CLOSE command is given only following a brief interruption of the closing signal. This prevents continuous closing and opening (= "pumping") operations.

Closing spring charged indication

The circuit breakers have a mechanically operated spring charged indicator. The charging status of the closing spring can also be queried electrically by means of an integrated position switch.

Circuit breaker tripping signal

During electrical opening, the NO contact S6 makes brief contact. This is often used to operate a hazard warning system which should respond to automatic tripping of the circuit breaker. In case of local control, the NO contact S6 does not close.

The corresponding circuit diagrams can be found in the associated circuit manuals. See also page 76.

Interlocking

Mechanical interlocking

At the interface of the mechanical interlocking of the circuit breaker, sensors on the switchgear side can check the switch position and prevent the associated disconnector from being operated while the circuit breaker is closed. The system also prevents the circuit breaker from being closed while the associated disconnector is in the fault position.

Circuit breakers mounted on withdrawable parts are mechanically interlocked so that the handle for racking the withdrawable part can only be inserted while the breaker is in the OPEN position. The lock of the withdrawable part can be released by operating the pushing handles and only while the withdrawable part is in the disconnected position.

If the circuit breaker on the withdrawable part is in an intermediate position (neither in the service nor in the disconnected position), operation is prevented by the mechanical interlocking.

An optional key-operated interlock enables mechanical closing only in combination with the operated lock.

Electrical interlocking

The auxiliary and signaling contacts which query the switch position of the circuit breaker or the position of the withdrawable part can be integrated in the switchgear interlocking concept. Furthermore, mechanical closing can also be prevented by means of an optional, electrical closing lockout, in order to prevent impermissible switching sequences.

Low-voltage interface

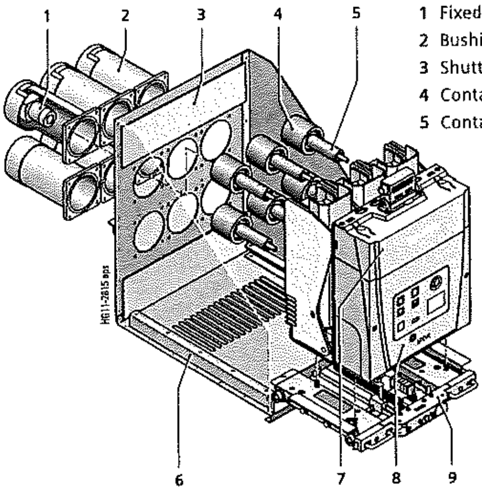
The removable cover of the SION 3AE1 and 3AE5 vacuum circuit breakers enables easy access to the low-voltage interface. All customer-side control and signaling options are concentrated here.

Withdrawable module

The withdrawable module contains all components required for the circuit breaker compartment of a switchgear panel. It consists of the circuit breaker mounted on a withdrawable part, with contact arms, fitted in a cartridge with side and rear walls. The withdrawable module is equipped with bushings, fixed contacts, shutters and the shutter mechanism. The side and rear walls form the tested connection compartment.

The circuit breaker on the withdrawable part is racked into the cartridge with the handle by rotating the spindle. The shutter mechanism is controlled by lateral gates, and the shutters are opened for contacting. Signals for the service and disconnected positions are transmitted to the module connector at the low-voltage interface of the vacuum circuit breaker via the position switches of the withdrawable part.

Withdrawable module 3AE1



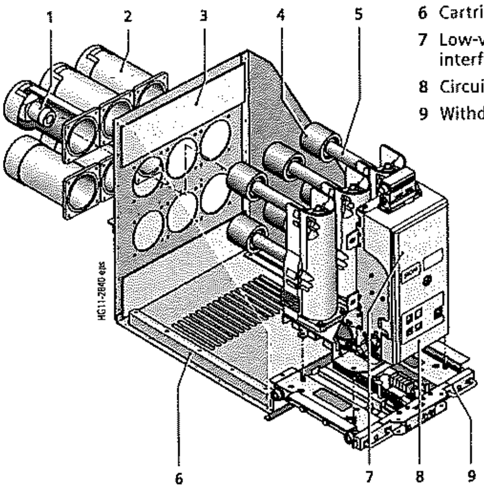
1 Fixed contact
2 Bushing
3 Shutters
4 Contact
5 Contact arm

Withdrawable module with make-proof earthing switch

The make-proof earthing switch at the cartridge has a defined making capacity up to the values stated on the circuit breaker rating plate. It features a compact design with spring-operated mechanism and a switching angle of 90°, low torques for closing and opening, as well as low maintenance.

The make-proof earthing switch has been tested in the withdrawable module and complies with the relevant standards for the switchgear panels.

Withdrawable module 3AE5



6 Cartridge
7 Low-voltage interface
8 Circuit breaker
9 Withdrawable part

Standards

The circuit breakers conform to the following standards:

- IEC 62271-1
- IEC 62271-100

All circuit breakers fulfill the endurance classes
C2, E2, M2 and S1 according to IEC 62271-100, as well as the shortest rated operating sequence O - 0.3s - CO - 15s - CO.

3AE5 circuit breakers up to 12 kV / 31.5 kA / 1250 A comply with the DNVGL-CG-0339 classification for marine applications.

The withdrawable modules have been tested according to

- IEC 62271-200, 62271-1 and 62271-102 regarding
  - Dielectric strength
  - Temperature rise
  - Switching capacity.

For class C2, all circuit breakers comply with the following values acc. to IEC 62271-100.

	Line	Cable	Capacitors	Back-to-back capacitor bank	
Rated voltage U_r kV, r.m.s.	Rated line-charging breaking current I_l A, r.m.s.	Rated cable-charging breaking current I_c A, r.m.s.	Rated single-capacitor-bank breaking current I_{sb} A, r.m.s.	Rated back-to-back-capacitor-bank breaking current I_{bb} A, r.m.s.	Frequency of the inrush making current f_{bi} Hz
7.2	10	10	400	400	4250
12	10	25	400	400	4250
17.5	10	31.5	400	400	4250
24	10	31.5	400	400	4250

Rated back-to-back-capacitor-bank inrush making current – see chapter 3: Technical data

Maintenance-free design

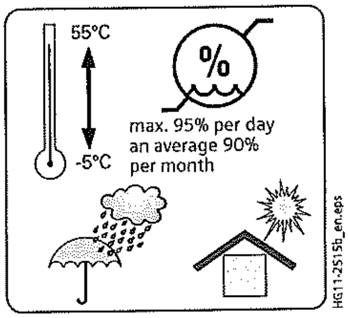
The circuit breakers are maintenance-free:

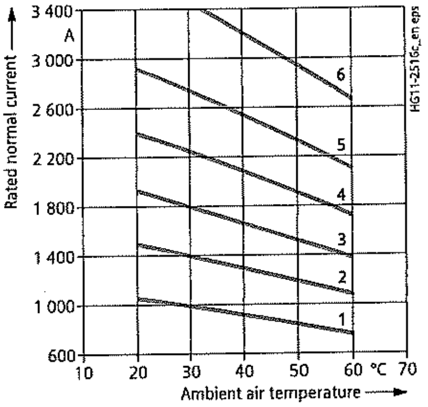
- Under normal ambient conditions according to IEC 62271-1
- Up to 10,000 operating cycles maintenance-free
  - no regreasing
  - no readjusting
- Up to 30,000 operating cycles with maintenance work for the 3AE5

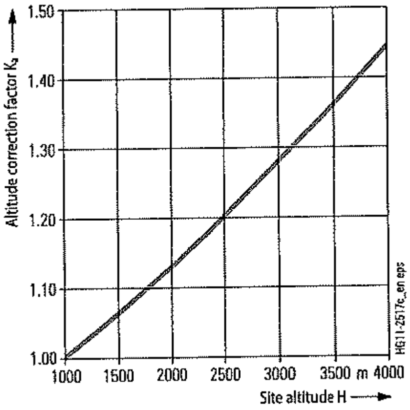
The ratings are independent within their tolerances of the switching frequency or standing times without switching.

Interlocking

Vacuum circuit breaker	Disconnected position	Racking	Service position	Switching state of vacuum circuit breaker	Interlocking of vacuum circuit breaker against closing (optionally with key-operated interlock)	Interlocking of withdrawable part in the switchgear panel (latching of locking handles) in disconnected position	Interlocking of racking the withdrawable part (between disconnected, test and service position)	Switching state of the earthing switch	Interlocking of the earthing switch against closing
Fixed-mounted			■	OPEN	Interlockable				
			■	CLOSED					
Disconnecting on withdrawable part and in withdrawable module	■			CLOSED			Active		
	■			OPEN					
		■		OPEN	Active	Active			
			■	CLOSED		Active	Active		
Disconnecting on withdrawable part, in withdrawable module and with earthing switch	■			CLOSED			Active	OPEN	
	■			OPEN				OPEN	
		■		OPEN	Active	Active		OPEN	Active
			■	CLOSED		Active	Active	OPEN	Active
Grounding on withdrawable part, in withdrawable module and with earthing switch	■			OPEN or CLOSED				OPEN	
	■			OPEN or CLOSED			Active	OPEN	







Ambient conditions

The circuit breakers are designed for normal operating conditions as defined in IEC 62271-100. Condensation can occasionally occur under the ambient conditions shown opposite.

The circuit breakers are suitable for use in the following climatic classes according to IEC 60721, Part 3-3:

Climatic ambient conditions:	Class 3K4 [1]
Biological ambient conditions:	Class 3B1
Mechanical ambient conditions:	Class 3M2
Chemically-active substances:	Class 3CS [3]
Mechanically-active substances:	Class 3S2 [2]

1) Lower temperature limit: -5 °C (with order code A40 down to -25 °C)
2) Restriction: Clean insulation parts
3) Without appearance of saline fog and simultaneous condensation

Current carrying capacity

The rated normal currents specified in the diagram have been defined according to IEC 62271-100 for an ambient air temperature of +40 °C and apply to open switchgear.

For enclosed switchgear, the data of the switchgear manufacturer applies.

At ambient air temperatures below +40 °C, higher normal currents can be carried (see diagram):

Characteristics curve **1** = Rated normal current 800 A
Characteristics curve **2** = Rated normal current 1250 A
Characteristics curve **3** = Rated normal current 1600 A
Characteristics curve **4** = Rated normal current 2000 A
Characteristics curve **5** = Rated normal current 2500 A
Characteristics curve **6** = Rated normal current 3150 A

Dielectric strength

The dielectric strength of air insulation decreases with increasing altitude due to lower air density. According to IEC 62271-1, the rated lightning impulse withstand voltage and the rated short-duration power-frequency withstand voltage specified in chapter "Technical data" apply to a site altitude of 1000 m above sea level. For altitudes above 1000 m, the insulation level must be corrected according to the diagram shown opposite.

The characteristics curve shown applies to both rated withstand voltages.

When selecting the devices, the following applies:

$U \geq U_0 \times K_a$

U Rated withstand voltage under reference atmosphere
U_0 Rated withstand voltage requested for the installation location
K_a Altitude correction factor according to the diagram shown opposite

Example

For a requested rated lightning impulse voltage of 75 kV at an altitude of 2500 m, an insulation level of at least 90 kV under reference atmosphere is required:

90 kV ≥ 75 kV x 1.2

Equipment

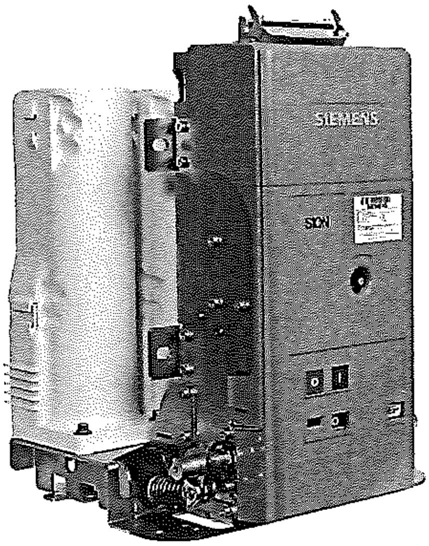
Features	Minimum equipment	Alternative equipment	Remarks
Operating mechanism	Electrical operating mechanism	None	Also for manual operation
Closing	Closing solenoid and mechanical manual closing	None	–
1st release	Shunt release	Undervoltage release, c.-t.-operated release	For SION 3AE5, only shunt releases are possible
2nd release	None	Shunt release, undervoltage release, c.-t.-operated release	Combination of 2 undervoltage releases or 2 c.t.-operated releases is not possible for 3AE1
3rd release	None	Shunt release, c.t.-operated release	Only in combination with wide operating mechanism housing; combination of 2 undervoltage releases is not possible for 3AE5.
Varistor circuit	Standard for ≥ 60 V DC	None	For limiting switching overvoltages
Auxiliary switch	6 NO + 6 NC	12 NO + 12 NC	–
Plug connection	27-pole terminal strip f. SION 3AE1 20-pole plug connector f. SION 3AE5	24-pole plug, 64-pole plug	12 NO + 12 NC not available with 24-pole plug
Anti-pumping	Available	None	–
Circuit breaker tripping signal	None	Possible	–
Operation cycles counter	Available	None	–
Position switches for withdrawable part	5 momentary-contact position switches per position	None	–
Interlocking	Mechanical interlocking available at the withdrawable module	Mechanical interlocking for circuit breaker Electrical closing lock-out for 3AE5 Key-operated interlocking	Required for withdrawable part
Installation type	Fixed-mounted	Withdrawable part with/without contact arms and contact, fixed contacts and bushings, withdrawable module with/without make-proof earthing switch	–

Product range overview: Circuit breaker without installation accessories

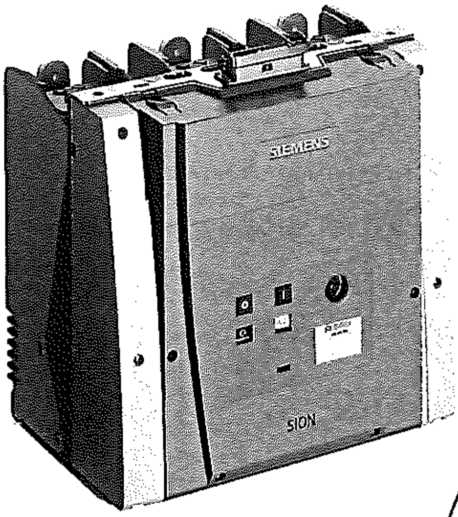
	Rated voltage	Rated short-circuit breaking current	Rated normal current	Pole-center distance (in mm)									
				150			160			210			275
				Width across flats (in mm)									
Type	kV	kA	A	205	275	310	205	275	310	205	275	310	310
3AE50	7.2	16/20/25/31.5	800/1250	■	■	■	■	■	■	■	■	■	
3AE50	7.2	16/20/25/31.5	1600									■	
3AE50	7.2	25/31.5	2000/2500									■	
3AE10	7.2	40	1250/2000 2500/3150									■	
3AE51	12	16/20/25/31.5	800/1250	■	■	■	■	■	■	■	■	■	
3AE51	12	16/20/25/31.5	1600									■	
3AE51	12	20/25/31.5	2000/2500									■	■
3AE11	12	40	1250/2000 2500/3150									■	■
3AE52	17.5	16/25/31.5	800/1250	■	■	■	■	■	■	■	■	■	
3EA52	17.5	16/25/31.5	1600			■			■			■	■
3AE52	17.5	25/31.5	2000/2500									■	■
3AE12	17.5	40	1250/2000/ 2500/3150									■	■
3AE13/3AE53	24	16/20/25	800/1250									■	■
3AE13	24	16	800/1250/2000									■	■
		20/25	2000/2500									■	■

Note: The circuit breaker is available with various installation accessories. These versions can be configured from page 18 onwards.

R-HG11-377.tif


R-HG11-378.tif

3AE5 vacuum circuit breaker as fixed-mounted version


R-HG11-176.eps

3AE1 vacuum circuit breaker as fixed-mounted version

Article number structure

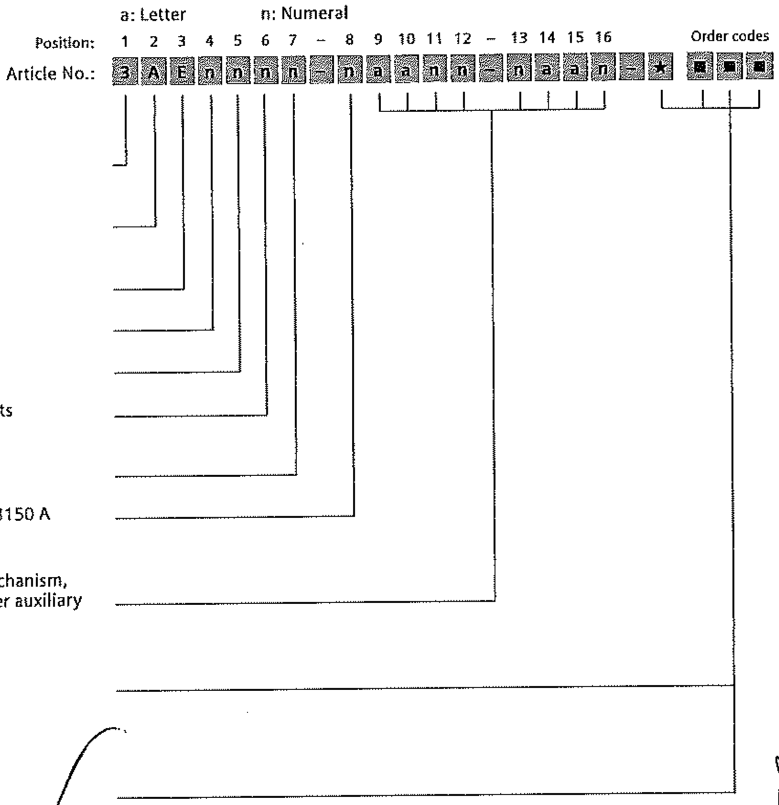
The circuit breakers consist of a primary and a secondary part. The primary part covers the main electrical data of the circuit breaker poles. The secondary part covers the auxiliary devices which are necessary for operating and controlling the vacuum circuit breaker. The relevant data makes up the 16-digit article number.

Order codes

Individual equipment versions, marked with **9** or **Z** in the 9th to 16th position, are explained in more detail by a 3-digit order code. Several order codes can be added to the article number in succession and in any sequence.

Special versions (★)

In case of special versions, "-Z" is added to the article number and a descriptive order code follows.
If several special versions are required, the suffix "-**Z**" is listed only once. If a requested special version is not in the catalog and can therefore not be ordered via order code, it has to be identified with **Y 9 9** after consultation with us. The consultation must take place directly between your sales partner and the order processing department at Siemens. Special wiring designs can also be ordered with **B99**.



1st position	**Primary part** Superior group Switching devices
2nd position	Main group Circuit breaker
3rd position	Subgroup Circuit breaker type series
4th position	Circuit breaker version
5th position	Rated voltage from 7.2 kV to 24 kV
6th position	Pole-center distance / Width across flats
7th position	Rated short-circuit breaking current from 16 kA to 40 kA
8th position	Rated normal current from 800 A to 3150 A
9th to 16th position	**Secondary part** Secondary equipment, operating mechanism, releases, operating voltages and other auxiliary equipment
	Order codes Groups of 3 after the article number Format: a n a
	Special versions (★) Initiated with "-Z" Groups of 3 after the article number Format: a n n

C22

Configuration example

To help you select the correct article number for the circuit breaker type that you require, you will find two configuration examples below. Two complete circuit breakers have been configured as examples.

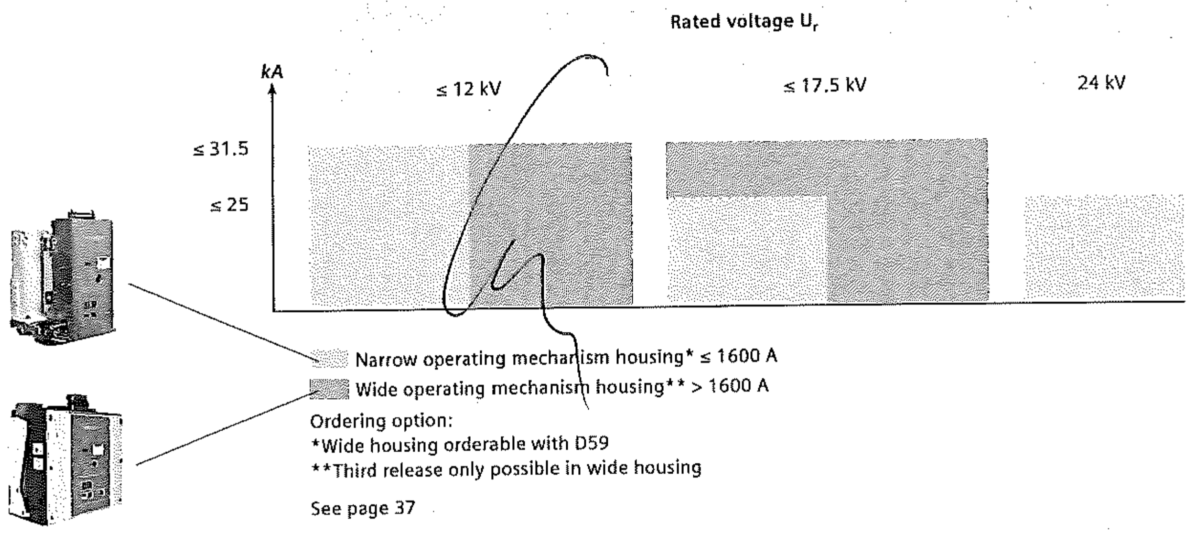
On the foldout page, you can enter the Article No. determined for your circuit breaker. Based on the Article No., you can request an offer from your Siemens partner.

Configuration example 1: SION 3AE5 withdrawable module (vacuum circuit breaker on withdrawable part in cartridge)

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16	–		Order codes		
Article No.:	3	A	E	5	■	■	■	–	■	■	■	■	■	–	■	■	■	■	–	★	■	■	■
Configuration example																							
SION vacuum circuit breaker	3	A	E	5																			
Rated voltage U_r = **12 kV, 50/60 Hz**																							
Rated lightning impulse voltage U_p = **75 kV**																							
Rated short-circuit breaking current I_{sc} = **25 kA**																							
Rated normal current I_r = **1250 A**																							
Pole-center distance = **150 mm**																							
Width across flats = **310 mm**					1	2	4	–	2														
1st shunt release (only one shunt release)										A													
Operating voltage of the closing solenoid **48 V DC**											C												
Operating voltage of the 1st release **32 V DC**												9									L	1	B
Without 2nd release													0	–									
Circuit breaker on withdrawable part, with cartridge, contact arms, contacts, fixed contacts, bushings, shutters, earthing switch with short-circuit making capacity															6								
Operating voltage of the drive motor **230 V AC**																K							
With mechanical interlocking, circuit breaker tripping signal, auxiliary switch 12 NO + 12 NC and 64-pole plug																	N						
Frequency of the operating voltage 50 Hz and DC, operating instructions and rating plate in German																		0					
Hand crank																			–	Z	F	3	0

Example of an Article No.: 3 A E 5 1 2 4 – 2 A C 9 0 – 6 K N 0 – Z
Order codes: L 1 B + F 3 0

Options for the operating mechanism housing



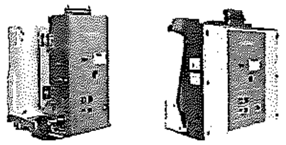
░ Narrow operating mechanism housing* ≤ 1600 A
▨ Wide operating mechanism housing** > 1600 A

Ordering option:
*Wide housing orderable with D59
**Third release only possible in wide housing

See page 37

Device selection

Circuit breaker and equipment package



7.2 kV

Position: 1 2 3 4 5 6 7 – 8 9–12 13th position = Equipment package 14–16 Order codes

Article No.: 3 A E 5 ■ ■ ■ – ■ ■ – ■ ■ – ★ ■ ■ ■

Rated voltage for 50/60 Hz U_r kV	Rated lightning impulse voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Rated short-circuit breaking current with 50% DC component I_{sc} kA	Rated short-circuit making current (at 50/60 Hz) I_{ma} kA	Pole-center distance mm	Width across flats mm	Rated normal current I_r A	Article No. (positions 1–8)	See pages 35 and 36	Orderable versions: Circuit breaker for fixed mounting, without circuit breaker installation accessories	On withdrawable part	On withdrawable part with complete contact system *	On withdrawable part with complete contact system and bushings *	Withdrawable module without earthing switch	Withdrawable module with earthing switch	See pages 38 to 40	See page 41
7.2	60	20	16	40/42	210	310	800	3AE5082-1		■	■	●	●	●	●		
						310	1250	3AE5082-2		■	■	●	●	●	●		
						310	1600	3AE5082-3		■	■	●	●	●	●		
						275	800	3AE5072-1		■	■	●	●	●	●		
						275	1250	3AE5072-2		■	■	●	●	●	●		
						205	800	3AE5062-1		■	■	●	●				
						205	1250	3AE5062-2		■	■	●	●				
					160	310	800	3AE5052-1		■	■	●	●				
						310	1250	3AE5052-2		■	■	●	●				
						310	1600	3AE5052-3		■	■	●	●				
						275	800	3AE5042-1		■	■	●	●				
						275	1250	3AE5042-2		■	■	●	●				
						205	800	3AE5032-1		■	■	●	●				
						205	1250	3AE5032-2		■	■	●	●				
					150	310	800	3AE5022-1		■	■	●	●	●	●		
						310	1250	3AE5022-2		■	■	●	●	●	●		
						310	1600	3AE5022-3		■	■	●	●	●	●		
						275	800	3AE5012-1		■	■	●	●	●	●		
						275	1250	3AE5012-2		■	■	●	●	●	●		
						205	800	3AE5002-1		■	■	●	●				
						205	1250	3AE5002-2		■	■	●	●				
7.2	60	20	20	50/52	210	310	800	3AE5083-1		■	■	●	●	●	●		
						310	1250	3AE5083-2		■	■	●	●	●	●		
						310	1600	3AE5083-3		■	■	●	●	●	●		
						275	800	3AE5073-1		■	■	●	●	●	●		
						275	1250	3AE5073-2		■	■	●	●	●	●		
						205	800	3AE5063-1		■	■	●	●				
						205	1250	3AE5063-2		■	■	●	●				
					160	310	800	3AE5053-1		■	■	●	●				
						310	1250	3AE5053-2		■	■	●	●				
						310	1600	3AE5053-3		■	■	●	●				
						275	800	3AE5043-1		■	■	●	●				
						275	1250	3AE5043-2		■	■	●	●				
						205	800	3AE5033-1		■	■	●	●				
						205	1250	3AE5033-2		■	■	●	●				
					150	310	800	3AE5023-1		■	■	●	●	●	●		
						310	1250	3AE5023-2		■	■	●	●	●	●		
						310	1600	3AE5023-3		■	■	●	●	●	●		
						275	800	3AE5013-1		■	■	●	●	●	●		
						275	1250	3AE5013-2		■	■	●	●	●	●		
						205	800	3AE5003-1		■	■	●	●				
						205	1250	3AE5003-2		■	■	●	●				
7.2	60	20	25	63/65	210	310	800	3AE5084-1		■	■	●	●	●	●		
						310	1250	3AE5084-2		■	■	●	●	●	●		

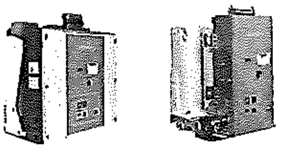
Special version U_d = 32 kV – Z E 1 6

Legend: ● With contact system
■ Without contact system

*) Can also be ordered without withdrawable part, see page 37, 13th position

Device selection

Circuit breaker and equipment package



7.2 kV

Position: 1 2 3 4 5 6 7 – 8 9–12 | 13th position = Equipment package | 14–16 | Order codes

Article No.: 3 A E 5 ■ ■ ■ – ■ ■ – | ■ | ■ – ★ | ■ ■ ■

Rated voltage for 50/60 Hz U_r kV	Rated lightning impulse voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Rated short-circuit breaking current with 50% DC component I_{sc} kA	Rated short-circuit making current (at 50/60 Hz) I_{ma} kA	Pole-center distance mm	Width across flats mm	Rated normal current I_r A	Position 1 2 3 4 5 6 7 – 8	9–12 See pages 35 and 36	Orderable versions: Circuit breaker for fixed mounting, without circuit breaker installation accessories	On withdrawable part	On withdrawable part with complete contact system *	On withdrawable part with complete contact system and bushings *	Withdrawable module without earthing switch	Withdrawable module with earthing switch	14–16 See pages 38 to 40	See page 41	Order codes
						310	1600	3 A E 5 0 8 4 – 3		■	■	●	●	●	●			
						310	2000	3 A E 5 0 8 4 – 4		■	■	●	●	●	●			
						310	2500	3 A E 5 0 8 4 – 6		■	■	●	●	●	●			
						275	800	3 A E 5 0 7 4 – 1		■	■	●	●	●	●			
						275	1250	3 A E 5 0 7 4 – 2		■	■	●	●	●	●			
						205	800	3 A E 5 0 6 4 – 1		■	■	●	●					
						205	1250	3 A E 5 0 6 4 – 2		■	■	●	●					
					160	310	800	3 A E 5 0 5 4 – 1		■	■	●	●					
						310	1250	3 A E 5 0 5 4 – 2		■	■	●	●					
						310	1600	3 A E 5 0 5 4 – 3		■	■	●	●					
						275	800	3 A E 5 0 4 4 – 1		■	■	●	●					
						275	1250	3 A E 5 0 4 4 – 2		■	■	●	●					
						205	800	3 A E 5 0 3 4 – 1		■	■	●	●					
						205	1250	3 A E 5 0 3 4 – 2		■	■	●	●					
					150	310	800	3 A E 5 0 2 4 – 1		■	■	●	●	●	●			
						310	1250	3 A E 5 0 2 4 – 2		■	■	●	●	●	●			
						310	1600	3 A E 5 0 2 4 – 3		■	■	●	●	●	●			
						275	800	3 A E 5 0 1 4 – 1		■	■	●	●	●	●			
						275	1250	3 A E 5 0 1 4 – 2		■	■	●	●	●	●			
						205	800	3 A E 5 0 0 4 – 1		■	■	●	●					
						205	1250	3 A E 5 0 0 4 – 2		■	■	●	●					
7.2	60	20	31.5	80/82	210	310	800	3 A E 5 0 8 5 – 1		■	■	●	●	●	●			
						310	1250	3 A E 5 0 8 5 – 2		■	■	●	●	●	●			
						310	1600	3 A E 5 0 8 5 – 3		■	■	●	●	●	●			
						310	2000	3 A E 5 0 8 5 – 4		■	■	●	●	●	●			
						310	2500	3 A E 5 0 8 5 – 6		■	■	●	●	●	●			
						275	800	3 A E 5 0 7 5 – 1		■	■	●	●	●	●			
						275	1250	3 A E 5 0 7 5 – 2		■	■	●	●	●	●			
						205	800	3 A E 5 0 6 5 – 1		■	■	●	●					
						205	1250	3 A E 5 0 6 5 – 2		■	■	●	●					
					160	310	800	3 A E 5 0 5 5 – 1		■	■	●	●					
						310	1250	3 A E 5 0 5 5 – 2		■	■	●	●					
						310	1600	3 A E 5 0 5 5 – 3		■	■	●	●					
						275	800	3 A E 5 0 4 5 – 1		■	■	●	●					
						275	1250	3 A E 5 0 4 5 – 2		■	■	●	●					
						205	800	3 A E 5 0 3 5 – 1		■	■	●	●					
						205	1250	3 A E 5 0 3 5 – 2		■	■	●	●					
					150	310	800	3 A E 5 0 2 5 – 1		■	■	●	●	●	●			
						310	1250	3 A E 5 0 2 5 – 2		■	■	●	●	●	●			
						310	1600	3 A E 5 0 2 5 – 3		■	■	●	●	●	●			
						275	800	3 A E 5 0 1 5 – 1		■	■	●	●	●	●			
						275	1250	3 A E 5 0 1 5 – 2		■	■	●	●	●	●			
						205	800	3 A E 5 0 0 5 – 1		■	■	●	●					
						205	1250	3 A E 5 0 0 5 – 2		■	■	●	●					
Special version U_d = 32 kV																		– Z E 1 6
I_{sc} **) = 26.3 kA																		– Z E 4 6

Legend:
- ● With contact system
- ■ Without contact system

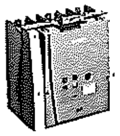
*) Can also be ordered without withdrawable part, see page 37, 13th position

**) Only possible with I_{sc} = 25 kA

525

Device selection

Circuit breaker and equipment package



7.2 kV

							Position:	1	2	3	4	5	6	7	–	8	9–12	13th position = Equipment package						14–16	Order codes
							Article No.:	3	A	E	1	■	■	■	–	■	■ –	■						■ – ★	■ ■ ■
																		Orderable versions							
Rated voltage for 50/60 Hz U_r kV	Rated lightning impulse voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Rated short-circuit breaking current with 36% DC component I_{sc} kA	Rated short-circuit making current (at 50/60 Hz) I_{ma} kA	Pole-center distance mm	Width across flats mm	Rated normal current I_r A										See pages 35 and 36	Circuit breaker for fixed mounting, without circuit breaker installation accessories	On withdrawable part	On withdrawable part with complete contact system *	On withdrawable part with complete contact system and bushings *	Withdrawable module without earthing switch	Withdrawable module with earthing switch	See pages 38 to 40	See page 41
7.2	60	20	40	100/104	210	310	1250	3	A	E	1	0	8	6	–	2		■	■	●	●	●	●		
						310	2000	3	A	E	1	0	8	6	–	4		■	■	●	●	●	●		
						310	2500	3	A	E	1	0	8	6	–	6		■	■	●	●	●	●		
						310	3150	3	A	E	1	0	8	6	–	7		■	■	●	●	●	●		
Special version U_d = 32 kV																								– Z	E 1 6

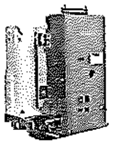
Legend:
- ● With contact system
- ■ Without contact system

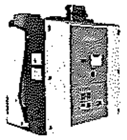
*) Can also be ordered without withdrawable part, see page 37, 13th position

526

Device selection

Circuit breaker and equipment package





12 kV

Rated voltage for 50/60 Hz U_r kV	Rated lightning impulse voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Rated short-circuit breaking current with 50% DC component I_{sc} kA	Rated short-circuit making current (at 50/60 Hz) I_{ma} kA	Pole-center distance mm	Width across flats mm	Rated normal current I_r A	Position: 1	2	3	4	5	6	7	–	8	9–12 See pages 35 and 36	13th position = Equipment package. Orderable versions: Circuit breaker for fixed mounting, without circuit breaker installation accessories	On withdrawable part	On withdrawable part with complete contact system *	On withdrawable part with complete contact system and bushings *	Withdrawable module without earthing switch	Withdrawable module with earthing switch	14–16 See pages 38 to 40	Order codes See page 41
							Article No.:	3	A	E	5	■	■	■	–	■	■ –	■						■ – ★	■ ■ ■
12	75	28	16	40/42	210	310	800	3	A	E	5	1	8	2	–	1		■	■	●	●	●	●		
						310	1250	3	A	E	5	1	8	2	–	2		■	■	●	●	●	●		
						310	1600	3	A	E	5	1	8	2	–	3		■	■	●	●	●	●		
						275	800	3	A	E	5	1	7	2	–	1		■	■	●	●	●	●		
						275	1250	3	A	E	5	1	7	2	–	2		■	■	●	●	●	●		
						205	800	3	A	E	5	1	6	2	–	1		■	■	●	●				
						205	1250	3	A	E	5	1	6	2	–	2		■	■	●	●				
					160	310	800	3	A	E	5	1	5	2	–	1		■	■	●	●				
						310	1250	3	A	E	5	1	5	2	–	2		■	■	●	●				
						310	1600	3	A	E	5	1	5	2	–	3		■	■	●	●				
						275	800	3	A	E	5	1	4	2	–	1		■	■	●	●				
						275	1250	3	A	E	5	1	4	2	–	2		■	■	●	●				
						205	800	3	A	E	5	1	3	2	–	1		■	■	●	●				
						205	1250	3	A	E	5	1	3	2	–	2		■	■	●	●				
					150	310	800	3	A	E	5	1	2	2	–	1		■	■	●	●	●	●		
						310	1250	3	A	E	5	1	2	2	–	2		■	■	●	●	●	●		
						310	1600	3	A	E	5	1	2	2	–	3		■	■	●	●	●	●		
						275	800	3	A	E	5	1	1	2	–	1		■	■	●	●	●	●		
						275	1250	3	A	E	5	1	1	2	–	2		■	■	●	●	●	●		
						205	800	3	A	E	5	1	0	2	–	1		■	■	●	●				
						205	1250	3	A	E	5	1	0	2	–	2		■	■	●	●				
12	75	28	20	50/52	275	310	2000	3	A	E	5	5	8	3	–	4		■	■	●	●				
						310	2500	3	A	E	5	5	8	3	–	6		■	■	●	●				
					210	310	800	3	A	E	5	1	8	3	–	1		■	■	●	●	●	●		
						310	1250	3	A	E	5	1	8	3	–	2		■	■	●	●	●	●		
						310	1600	3	A	E	5	1	8	3	–	3		■	■	●	●	●	●		
						310	2000	3	A	E	5	1	8	3	–	4		■	■	●	●	●	●		
						310	2500	3	A	E	5	1	8	3	–	6		■	■	●	●	●	●		
						275	800	3	A	E	5	1	7	3	–	1		■	■	●	●	●	●		
						275	1250	3	A	E	5	1	7	3	–	2		■	■	●	●	●	●		
						205	800	3	A	E	5	1	6	3	–	1		■	■	●	●				
						205	1250	3	A	E	5	1	6	3	–	2		■	■	●	●				
					160	310	800	3	A	E	5	1	5	3	–	1		■	■	●	●				
						310	1250	3	A	E	5	1	5	3	–	2		■	■	●	●				
						310	1600	3	A	E	5	1	5	3	–	3		■	■	●	●				
						275	800	3	A	E	5	1	4	3	–	1		■	■	●	●				
						275	1250	3	A	E	5	1	4	3	–	2		■	■	●	●				
						205	800	3	A	E	5	1	3	3	–	1		■	■	●	●				
						205	1250	3	A	E	5	1	3	3	–	2		■	■	●	●				
					150	310	800	3	A	E	5	1	2	3	–	1		■	■	●	●	●	●		
						310	1250	3	A	E	5	1	2	3	–	2		■	■	●	●	●	●		
						310	1600	3	A	E	5	1	2	3	–	3		■	■	●	●	●	●		
Special version $U_d = 42$ kV																									– Z E 1 3
$U_p = 95$ kV																									– Z E 9 5

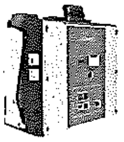
Legend:
- ● With contact system
- ■ Without contact system

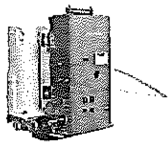
*) Can also be ordered without withdrawable part, see page 37, 13th position

517

Device selection

Circuit breaker and equipment package





12 kV

Position: 1 2 3 4 5 6 7 – 8 9–12 – 13th position = Equipment package 14–16 – Order codes

Article No.: 3 A E 5 ■ ■ ■ – ■ ■ – ■ ■ – ★ ■ ■ ■

Rated voltage for 50/60 Hz U_r kV	Rated lightning impulse voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Rated short-circuit breaking current with 50% DC component I_{sc} kA	Rated short-circuit making current (at 50/60 Hz) I_{ma} kA	Pole-center distance mm	Width across flats mm	Rated normal current I_r A	1	2	3	4	5	6	7	–	8	9–12 See pages 35 and 36	Circuit breaker for fixed mounting, without circuit breaker installation accessories	On withdrawable part	On withdrawable part with complete contact system *	On withdrawable part with complete contact system and bushings *	Withdrawable module without earthing switch	Withdrawable module with earthing switch	14–16 See pages 38 to 40	See page 41	Order codes
						275	800	3	A	E	5	1	1	3	–	1		■	■	●	●	●	●			
						275	1250	3	A	E	5	1	1	3	–	2		■	■	●	●	●	●			
						205	800	3	A	E	5	1	0	3	–	1		■	■	●	●					
						205	1250	3	A	E	5	1	0	3	–	2		■	■	●	●					
12	75	28	25	63/65	275	310	2000	3	A	E	5	5	8	4	–	4		■	■	●	●					
						310	2500	3	A	E	5	5	8	4	–	6		■	■	●	●					
					210	310	800	3	A	E	5	1	8	4	–	1		■	■	●	●	●	●			
						310	1250	3	A	E	5	1	8	4	–	2		■	■	●	●	●	●			
						310	1600	3	A	E	5	1	8	4	–	3		■	■	●	●	●	●			
						310	2000	3	A	E	5	1	8	4	–	4		■	■	●	●	●	●			
						310	2500	3	A	E	5	1	8	4	–	6		■	■	●	●	●	●			
						275	800	3	A	E	5	1	7	4	–	1		■	■	●	●	●	●			
						275	1250	3	A	E	5	1	7	4	–	2		■	■	●	●	●	●			
						205	800	3	A	E	5	1	6	4	–	1		■	■	●	●					
						205	1250	3	A	E	5	1	6	4	–	2		■	■	●	●					
					160	310	800	3	A	E	5	1	5	4	–	1		■	■	●	●					
						310	1250	3	A	E	5	1	5	4	–	2		■	■	●	●					
						310	1600	3	A	E	5	1	5	4	–	3		■	■	●	●					
						275	800	3	A	E	5	1	4	4	–	1		■	■	●	●					
						275	1250	3	A	E	5	1	4	4	–	2		■	■	●	●					
						205	800	3	A	E	5	1	3	4	–	1		■	■	●	●					
						205	1250	3	A	E	5	1	3	4	–	2		■	■	●	●					
					150	310	800	3	A	E	5	1	2	4	–	1		■	■	●	●	●	●			
						310	1250	3	A	E	5	1	2	4	–	2		■	■	●	●	●	●			
						310	1600	3	A	E	5	1	2	4	–	3		■	■	●	●	●	●			
						275	800	3	A	E	5	1	1	4	–	1		■	■	●	●	●	●			
						275	1250	3	A	E	5	1	1	4	–	2		■	■	●	●	●	●			
						205	800	3	A	E	5	1	0	4	–	1		■	■	●	●					
						205	1250	3	A	E	5	1	0	4	–	2		■	■	●	●					
Special version U_d = 42 kV																									– Z	E 1 3
I_{sc} **) = 26.3 kA																									– Z	E 4 6
U_p = 95 kV																									– Z	E 9 5

Legend: ● With contact system
■ Without contact system

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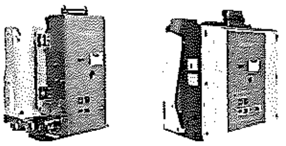
*) Can also be ordered without withdrawable part, page 37, 13th position

**) Only possible with I_{sc} = 25 kA

S2B



12 kV

Position: 1 2 3 4 5 6 7 – 8 9–12 – 13th position = Equipment package 14–16 Order codes

Article No.: 3 A E 5 ■ ■ ■ – ■ ■ – ■ ■ – ★ ■ ■ ■

Rated voltage for 50/60 Hz U_r kV	Rated lightning impulse voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Rated short-circuit breaking current with 50% DC component I_{sc} kA	Rated short-circuit making current (at 50/60 Hz) I_{ma} kA	Pole-center distance mm	Width across flats mm	Rated normal current I_r A	Article No. (Position 1–8)	9–12 See pages 35 and 36	Orderable versions: Circuit breaker for fixed mounting, without circuit breaker installation accessories	On withdrawable part	On withdrawable part with complete contact system *	On withdrawable part with complete contact system and bushings *	Withdrawable module without earthing switch	Withdrawable module with earthing switch	14–16 See pages 38 to 40	Order codes See page 41
12	75	28	31.5	80/82		310	2000	3 A E 5 5 8 5 – 4		■	■	●	●				
						310	2500	3 A E 5 5 8 5 – 6		■	■	●	●				
12	75	28	31.5	80/82	210	310	800	3 A E 5 1 8 5 – 1		■	■	●	●	●	●		
						310	1250	3 A E 5 1 8 5 – 2		■	■	●	●	●	●		
						310	1600	3 A E 5 1 8 5 – 3		■	■	●	●	●	●		
						310	2000	3 A E 5 1 8 5 – 4		■	■	●	●	●	●		
						310	2500	3 A E 5 1 8 5 – 6		■	■	●	●	●	●		
						275	800	3 A E 5 1 7 5 – 1		■	■	●	●	●	●		
						275	1250	3 A E 5 1 7 5- – 2		■	■	●	●	●	●		
						205	800	3 A E 5 1 6 5 – 1		■	■	●	●				
						205	1250	3 A E 5 1 6 5 – 2		■	■	●	●				
					160	310	800	3 A E 5 1 5 5 – 1		■	■	●	●				
						310	1250	3 A E 5 1 5 5 – 2		■	■	●	●				
						310	1600	3 A E 5 1 5 5 – 3		■	■	●	●				
						275	800	3 A E 5 1 4 5 – 1		■	■	●	●				
						275	1250	3 A E 5 1 4 5 – 2		■	■	●	●				
						205	800	3 A E 5 1 3 5 – 1		■	■	●	●				
						205	1250	3 A E 5 1 3 5 – 2		■	■	●	●				
					150	310	800	3 A E 5 1 2 5 – 1		■	■	●	●	●	●		
						310	1250	3 A E 5 1 2 5 – 2		■	■	●	●	●	●		
						310	1600	3 A E 5 1 2 5 – 3		■	■	●	●	●	●		
						275	800	3 A E 5 1 1 5 – 1		■	■	●	●	●	●		
						275	1250	3 A E 5 1 1 5 – 2		■	■	●	●	●	●		
						205	800	3 A E 5 1 0 5 – 1		■	■	●	●				
						205	1250	3 A E 5 1 0 5 – 2		■	■	●	●				
Special version U_d = 42 kV U_p = 95 kV																	– Z E 1 3 – Z E 9 5
Circuit breaker for installation in NXAIR World ¹⁾																	
12	75	28	25	63/65	160	275	800	3 A E 5 5 5 4 – 1		■							– Z W 6 3
						275	1250	3 A E 5 5 5 4 – 2		■							– Z W 6 3
					210	275	1600	3 A E 5 5 6 4 – 3		■							– Z W 6 3
			31.5	80/82	160	275	800	3 A E 5 5 5 5 – 1		■							– Z W 6 3
						275	1250	3 A E 5 5 5 5 – 2		■							– Z W 6 3
					210	275	1250	3 A E 5 5 6 5 – 2		■							– Z W 6 3
						275	1600	3 A E 5 5 6 5 – 3		■							– Z W 6 3
						275	2500	3 A E 5 5 6 5 – 6		■							– Z W 6 3
Special version U_d = 42 kV I_{sc} **) = 26.3 kA U_p = 95 kV																	– Z E 1 3 – Z E 4 6 – Z E 9 5

1) W63 is absolutely necessary as order code

Legend: ● With contact system
■ Without contact system

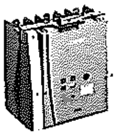
*) Can also be ordered without withdrawable part, see page 37, 13th position

**) Only possible with I_{sc} = 25 kA

529

Device selection

Circuit breaker and equipment package



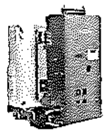
12 kV

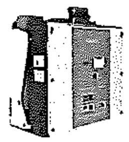
							Position:	1	2	3	4	5	6	7	–	8	9–12		13th position = Equipment package						14–16			Order codes		
							Article No.:	3	A	E	1	■	■	■	–	■	■	–	■						■	–	★	■	■	■
																			Orderable versions											
Rated voltage for 50/60 Hz U_r kV	Rated lightning impulse voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Rated short-circuit breaking current with 36% DC component I_{sc} kA	Rated short-circuit making current (at 50/60 Hz) I_{ma} kA	Pole-center distance mm	Width across flats mm	Rated normal current I_r A										See pages 35 and 36		Circuit breaker for fixed mounting, without circuit breaker installation accessories	On withdrawable part	On withdrawable part with complete contact system *	On withdrawable part with complete contact system and bushings *	Withdrawable module without earthing switch	Withdrawable module with earthing switch	See pages 38 to 40		See page 41			
12	75	28	40	100/104	275	310	1250	3	A	E	1	5	8	6	–	2			■	■	●	●								
						310	2000	3	A	E	1	5	8	6	–	4			■	■	●	●								
						310	2500	3	A	E	1	5	8	6	–	6			■	■	●	●								
						310	3150	3	A	E	1	5	8	6	–	7			■	■	●	●								
					210	310	1250	3	A	E	1	1	8	6	–	2			■	■	●	●	●	●						
						310	2000	3	A	E	1	1	8	6	–	4			■	■	●	●	●	●						
						310	2500	3	A	E	1	1	8	6	–	6			■	■	●	●	●	●						
						310	3150	3	A	E	1	1	8	6	–	7			■	■	●	●	●	●						
Circuit breaker for installation in NXAIR World 1)																														
Special version U_d = 42 kV																										–	Z	E	1	3
			40	100/104	210	275	1250	3	A	E	1	5	6	6	–	2			■							–	Z	W	6	3
						275	2500	3	A	E	1	5	6	6	–	6			■							–	Z	W	6	3
						275	3150	3	A	E	1	5	6	6	–	7			■							–	Z	W	6	3
Special version U_d = 42 kV																										–	Z	E	1	3

1) W63 is absolutely necessary as order code

*) Can also be ordered without withdrawable part, see page 37, 13th position

Legend:
- ● With contact system
- ■ Without contact system





17.5 kV

							Position:	1	2	3	4	5	6	7	–	8	9–12		13th position = Equipment package						14–16			Order codes		
							Article No.:	3	A	E	5	■	■	■	–	■	■	–	■						■	–	★	■	■	■
																			Orderable versions											
Rated voltage for 50/60 Hz U_r kV	Rated lightning impulse voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Rated short-circuit breaking current with 50% DC component I_{sc} kA	Rated short-circuit making current (at 50/60 Hz) I_{ma} kA	Pole-center distance mm	Width across flats mm	Rated normal current I_r A										See pages 35 and 36		Circuit breaker for fixed mounting, without circuit breaker installation accessories	On withdrawable part	On withdrawable part with complete contact system *	On withdrawable part with complete contact system and bushings *	Withdrawable module without earthing switch	Withdrawable module with earthing switch	See pages 38 to 40		See page 41			
17.5	95	38	16	40/42	210	310	800	3	A	E	5	2	8	2	–	1			■	■	●	●	●	●		–	Z	D	9	0**
						310	1250	3	A	E	5	2	8	2	–	2			■	■	●	●	●	●		–	Z	D	9	0**
						310	1600	3	A	E	5	2	8	2	–	3			■	■	●	●	●	●		–	Z	D	9	0**
						275	800	3	A	E	5	2	7	2	–	1			■	■	●	●	●	●		–	Z	D	9	0**
						275	1250	3	A	E	5	2	7	2	–	2			■	■	●	●	●	●		–	Z	D	9	0**
						205	800	3	A	E	5	2	6	2	–	1			■	■	●	●				–	Z	D	9	0**
						205	1250	3	A	E	5	2	6	2	–	2			■	■	●	●				–	Z	D	9	0**
					160	310	800	3	A	E	5	2	5	2	–	1			■	■	●	●				–	Z	D	9	0**
						310	1250	3	A	E	5	2	5	2	–	2			■	■	●	●				–	Z	D	9	0**
						310	1600	3	A	E	5	2	5	2	–	3			■	■	●	●				–	Z	D	9	0**
						275	800	3	A	E	5	2	4	2	–	1			■	■	●	●				–	Z	D	9	0**
						275	1250	3	A	E	5	2	4	2	–	2			■	■	●	●				–	Z	D	9	0**
						205	800	3	A	E	5	2	3	2	–	1			■	■	●	●				–	Z	D	9	0**
						205	1250	3	A	E	5	2	3	2	–	2			■	■	●	●				–	Z	D	9	0**
					150	310	800	3	A	E	5	2	2	2	–	1			■	■	●	●	●	●		–	Z	D	9	0**
						310	1250	3	A	E	5	2	2	2	–	2			■	■	●	●	●	●		–	Z	D	9	0**
						310	1600	3	A	E	5	2	2	2	–	3			■	■	●	●	●	●		–	Z	D	9	0**
						275	800	3	A	E	5	2	1	2	–	1			■	■	●	●	●	●		–	Z	D	9	0**
						275	1250	3	A	E	5	2	1	2	–	2			■	■	●	●	●	●		–	Z	D	9	0**
						205	800	3	A	E	5	2	0	2	–	1			■	■	●	●				–	Z	D	9	0**
						205	1250	3	A	E	5	2	0	2	–	2			■	■	●	●				–	Z	D	9	0**
17.5	95	38	25	63/65	275	310	2000	3	A	E	5	6	5	4	–	4			■	■	●	●				–	Z	D	9	0**
						310	2500	3	A	E	5	6	5	4	–	6			■	■	●	●				–	Z	D	9	0**
					210	310	800	3	A	E	5	2	8	4	–	1			■	■	●	●	●	●		–	Z	D	9	0**
						310	1250	3	A	E	5	2	8	4	–	2			■	■	●	●	●	●		–	Z	D	9	0**
						310	1600	3	A	E	5	2	8	4	–	3			■	■	●	●	●	●		–	Z	D	9	0**
						310	2000	3	A	E	5	2	8	4	–	4			■	■	●	●	●	●		–	Z	D	9	0**
						310	2500	3	A	E	5	2	8	4	–	6			■	■	●	●	●	●		–	Z	D	9	0**
						275	800	3	A	E	5	2	7	4	–	1			■	■	●	●	●	●		–	Z	D	9	0**
						275	1250	3	A	E	5	2	7	4	–	2			■	■	●	●	●	●		–	Z	D	9	0**
						205	800	3	A	E	5	2	6	4	–	1			■	■	●	●				–	Z	D	9	0**
						205	1250	3	A	E	5	2	6	4	–	2			■	■	●	●				–	Z	D	9	0**
					160	310	800	3	A	E	5	2	5	4	–	1			■	■	●	●				–	Z	D	9	0**
						310	1250	3	A	E	5	2	5	4	–	2			■	■	●	●				–	Z	D	9	0**
						310	1600	3	A	E	5	2	5	4	–	3			■	■	●	●				–	Z	D	9	0**
						275	800	3	A	E	5	2	4	4	–	1			■	■	●	●				–	Z	D	9	0**
						275	1250	3	A	E	5	2	4	4	–	2			■	■	●	●				–	Z	D	9	0**
						205	800	3	A	E	5	2	3	4	–	1			■	■	●	●				–	Z	D	9	0**
						205	1250	3	A	E	5	2	3	4	–	2			■	■	●	●				–	Z	D	9	0**
					150	310	800	3	A	E	5	2	2	4	–	1			■	■	●	●	●	●		–	Z	D	9	0**
						310	1250	3	A	E	5	2	2	4	–	2			■	■	●	●	●	●		–	Z	D	9	0**
						310	1600	3	A	E	5	2	2	4	–	3			■	■	●	●	●	●		–	Z	D	9	0**
						275	800	3	A	E	5	2	1	4	–	1			■	■	●	●	●	●		–	Z	D	9	0**
						275	1250	3	A	E	5	2	1	4	–	2			■	■	●	●	●	●		–	Z	D	9	0**
						205	800	3	A	E	5	2	0	4	–	1			■	■	●	●				–	Z	D	9	0**
						205	1250	3	A	E	5	2	0	4	–	2			■	■	●	●				–	Z	D	9	0**

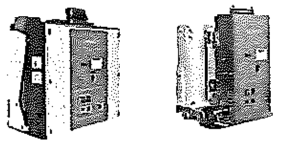
Legend: ● With contact system
■ Without contact system

*) Can also be ordered without withdrawable part, see page 37, 13th position

**) As a difference, other insulating shells are also possible, see page 37

Device selection

Circuit breaker and equipment package



17.5 kV

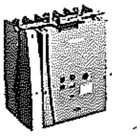
							Position:	1 2 3 4 5 6 7 – 8	9–12	13th position = Equipment package						14–16		Order codes
							Article No.:	3 A E 5 ■ ■ ■ – ■	■ –	■						■	– ★	■ ■ ■
										Orderable versions								
Rated voltage for 50/60 Hz U_r kV	Rated lightning impulse voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Rated short-circuit breaking current with 50% DC component I_{sc} kA	Rated short-circuit making current (at 50/60 Hz) I_{ma} kA	Pole-center distance mm	Width across flats mm	Rated normal current I_r A		See pages 35 and 36	Circuit breaker for fixed mounting, without circuit breaker installation accessories	On withdrawable part	On withdrawable part with complete contact system *	On withdrawable part with complete contact system and bushings *	Withdrawable module without earthing switch	Withdrawable module with earthing switch	See pages 38 to 40	See page 41	
17.5	95	38	31.5	63/65	275	310	1250	3 A E 5 6 5 5 – 2		■	■	●	●	●	●		– Z	D 9 0**
						310	1600	3 A E 5 6 5 5 – 3		■	■	●	●	●	●		– Z	D 9 0**
						310	2000	3 A E 5 6 5 5 – 4		■	■	●	●	●	●		– Z	D 9 0**
						310	2500	3 A E 5 6 5 5 – 6		■	■	●	●	●	●		– Z	D 9 0**
					210	310	800	3 A E 5 2 8 5 – 1		■	■	●	●	●	●		– Z	D 9 0**
						310	1250	3 A E 5 2 8 5 – 2		■	■	●	●	●	●		– Z	D 9 0**
						310	1600	3 A E 5 2 8 5 – 3		■	■	●	●	●	●		– Z	D 9 0**
						310	2000	3 A E 5 2 8 5 – 4		■	■	●	●	●	●		– Z	D 9 0**
						310	2500	3 A E 5 2 8 5 – 6		■	■	●	●	●	●		– Z	D 9 0**
						275	800	3 A E 5 2 7 5 – 1		■	■	●	●	●	●		– Z	D 9 0**
						275	1250	3 A E 5 2 7 5 – 2		■	■	●	●	●	●		– Z	D 9 0**
						205	800	3 A E 5 2 6 5 – 1		■	■	●					– Z	D 9 0**
						205	1250	3 A E 5 2 6 5 – 2		■	■	●					– Z	D 9 0**
					160	310	800	3 A E 5 2 5 5 – 1		■	■	●					– Z	D 9 0**
						310	1250	3 A E 5 2 5 5 – 2		■	■	●					– Z	D 9 0**
						310	1600	3 A E 5 2 5 5 – 3		■	■	●					– Z	D 9 0**
						275	800	3 A E 5 2 4 5 – 1		■	■	●					– Z	D 9 0**
						275	1250	3 A E 5 2 4 5 – 2		■	■	●					– Z	D 9 0**
						205	800	3 A E 5 2 3 5 – 1		■	■	●					– Z	D 9 0**
						205	1250	3 A E 5 2 3 5 – 2		■	■	●					– Z	D 9 0**
					150	310	800	3 A E 5 2 2 5 – 1		■	■	●	●	●	●		– Z	D 9 0**
						310	1250	3 A E 5 2 2 5 – 2		■	■	●	●	●	●		– Z	D 9 0**
						310	1600	3 A E 5 2 2 5 – 3		■	■	●	●	●	●		– Z	D 9 0**
						275	800	3 A E 5 2 1 5 – 1		■	■	●	●	●	●		– Z	D 9 0**
						275	1250	3 A E 5 2 1 5 – 2		■	■	●	●	●	●		– Z	D 9 0**
						205	800	3 A E 5 2 0 5 – 1		■	■	●	●				– Z	D 9 0**
						205	1250	3 A E 5 2 0 5 – 2		■	■	●	●				– Z	D 9 0**
Circuit breaker for installation in NXAIR World 1)																		
17.5	95	38	25	63/65	160	275	800	3 A E 5 6 2 4 – 1		■							– Z	W 6 3
						275	1250	3 A E 5 6 2 4 – 2		■							– Z	W 6 3
					210	275	800	3 A E 5 6 6 4 – 1		■							– Z	W 6 3
						275	1250	3 A E 5 6 6 4 – 2		■							– Z	W 6 3
					210	275	1600	3 A E 5 6 6 4 – 3		■							– Z	W 6 3
			31.5	80/82	160	275	800	3 A E 5 6 2 5 – 1		■							– Z	W 6 3
						275	1250	3 A E 5 6 2 5 – 2		■							– Z	W 6 3
					210	275	1250	3 A E 5 6 6 5 – 2		■							– Z	W 6 3
						275	1600	3 A E 5 6 6 5 – 3		■							– Z	W 6 3
						275	2500	3 A E 5 6 6 5 – 6		■							– Z	W 6 3

1) W63 is absolutely necessary as order code

*) Can also be ordered without withdrawable part, see page 37, 13th position

**) As a difference, other insulating shells are also possible, see page 37

Legend:
- ● With contact system
- ■ Without contact system



17.5 kV

							Position:	1	2	3	4	5	6	7	–	8	9–12		13th position = Equipment package						14–16			Order codes		
							Article No.:	3	A	E	1	■	■	■	–	■	■	–	■						■	–	★	■	■	■
																			Orderable versions											
Rated voltage for 50/60 Hz U_r kV	Rated lightning impulse voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Rated short-circuit breaking current with 36% DC component I_{sc} kA	Rated short-circuit making current (at 50/60 Hz) I_{ma} kA	Pole-center distance mm	Width across flats mm	Rated normal current I_r A										See pages 35 and 36		Circuit breaker for fixed mounting, without circuit breaker installation accessories	On withdrawable part	On withdrawable part with complete contact system *	On withdrawable part with complete contact system and bushings *	Withdrawable module without earthing switch	Withdrawable module with earthing switch	See pages 38 to 40		See page 41			
17.5	95	38	40	100/104	275	310	1250	3	A	E	1	6	5	6	–	2			■	■	●	●				–	Z	D	9	0**
						310	2000	3	A	E	1	6	5	6	–	4			■	■	●	●				–	Z	D	9	0**
						310	2500	3	A	E	1	6	5	6	–	6			■	■	●	●				–	Z	D	9	0**
						310	3150	3	A	E	1	6	5	6	–	7			■	■	●	●				–	Z	D	9	0**
					210	310	1250	3	A	E	1	2	8	6	–	2			■	■	●	●	●	●		–	Z	D	9	0**
						310	2000	3	A	E	1	2	8	6	–	4			■	■	●	●	●	●		–	Z	D	9	0**
						310	2500	3	A	E	1	2	8	6	–	6			■	■	●	●	●	●		–	Z	D	9	0**
						310	3150	3	A	E	1	2	8	6	–	7			■	■	●	●	●	●		–	Z	D	9	0**
Circuit breaker for installation in NXAIR World [1]																														
			40	100/104	210	275	1250	3	A	E	1	6	6	6	–	2			■							–	Z	W	6	3
						275	2500	3	A	E	1	6	6	6	–	6			■							–	Z	W	6	3
						275	3150	3	A	E	1	6	6	6	–	7			■							–	Z	W	6	3

Legend: ● With contact system ■ Without contact system

1) W63 is absolutely necessary as order code

*) Can also be ordered without withdrawable part, see page 37, 13th position

**) As a difference, other insulating shells are also possible, see page 37

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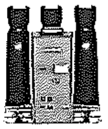
Device selection

Circuit breaker and equipment package



24 kV

							Position:	1	2	3	4	5	6	7	–	8	9–12	13th position = Equipment package						14–16		Order codes		
							Article No.:	3	A	E	5	■	■	■	–	■	■ –	■						■	– ★	■	■	■
																		Orderable versions										
Rated voltage for 50/60 Hz U_r kV	Rated lightning impulse voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Rated short-circuit breaking current with 50% DC component I_{sc} kA	Rated short-circuit making current (at 50/60 Hz) I_{ma} kA	Pole-center distance mm	Width across flats mm	Rated normal current I_r A										See pages 35 and 36	Circuit breaker for fixed mounting, without circuit breaker installation accessories	On withdrawable part	On withdrawable part with complete contact system *	On withdrawable part with complete contact system and bushings *	Withdrawable module without earthing switch	Withdrawable module with earthing switch	See pages 38 to 40	See page 41			
24	125	50	16	40/42	210	310	800	3	A	E	5	3	2	2	–	1		■	■	●	●	●	●					
						310	1250	3	A	E	5	3	2	2	–	2		■	■	●	●	●	●					
					275	310	800	3	A	E	5	3	5	2	–	1		■	■	●	●	●	●					
						310	1250	3	A	E	5	3	5	2	–	2		■	■	●	●	●	●					
24	125	50	20	50/52	210	310	800	3	A	E	5	3	2	3	–	1		■	■	●	●	●	●					
						310	1250	3	A	E	5	3	2	3	–	2		■	■	●	●	●	●					
					275	310	800	3	A	E	5	3	5	3	–	1		■	■	●	●	●	●					
						310	1250	3	A	E	5	3	5	3	–	2		■	■	●	●	●	●					
24	125	50	25	63/65	210	310	800	3	A	E	5	3	2	4	–	1		■	■	●	●	●	●					
						310	1250	3	A	E	5	3	2	4	–	2		■	■	●	●	●	●					
					275	310	800	3	A	E	5	3	5	4	–	1		■	■	●	●	●	●					
						310	1250	3	A	E	5	3	5	4	–	2		■	■	●	●	●	●					
Special version U_d = 55 kV																									– Z	E	5	5[1]
Special version U_d = 65 kV																									– Z	E	6	5[2]
Circuit breaker for installation in NXAIR World[3]																												
24	125	50	25	63/65	210	310	800	3	A	E	5	7	1	4	–	1		■							– Z	W	6	3
						310	1000	3	A	E	5	7	1	4	–	0		■							– Z	W	6	3
						310	1250	3	A	E	5	7	1	4	–	2		■							– Z	W	6	3
Special version U_d = 55 kV																									– Z	E	5	5[1]

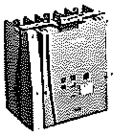
[1] With special version E55 (selection is possible if 13th position is 0, 1, 2, 3 and 5)

[2] With special version E65 (selection is possible if 13th position is 0 and 1)

[3] W63 is absolutely necessary as order code

*) Can also be ordered without withdrawable part, see page 37, 13th position

Legend: ● With contact system
■ Without contact system



24 kV

							Position:	1	2	3	4	5	6	7	–	8	9–12		13th position = Equipment package						14–16			Order codes
							Article No.:	3	A	E	1	■	■	■	–	■	■	–	■						■	–	★	■ ■ ■
																			Orderable versions									
Rated voltage for 50/60 Hz U_r kV	Rated lightning impulse voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Rated short-circuit breaking current with 36% DC component I_{sc} kA	Rated short-circuit making current (at 50/60 Hz) I_{ma} kA	Pole-center distance mm	Width across flats mm	Rated normal current I_r A										See pages 35 and 36		Circuit breaker for fixed mounting, without circuit breaker installation accessories	On withdrawable part	On withdrawable part with complete contact system *	On withdrawable part with complete contact system and bushings *	Withdrawable module without earthing switch	Withdrawable module with earthing switch	See pages 38 to 40		See page 41	
24	125	50	16	40/42	210	310	800	3	A	E	1	3	2	2	–	1			■	■	●	●	●	●				
						310	1250	3	A	E	1	3	2	2	–	2			■	■	●	●	●	●				
						310	2000	3	A	E	1	3	2	2	–	4			■	■	●	●	●	●				
					275	310	800	3	A	E	1	3	5	2	–	1			■	■	●	●	●	●				
						310	1250	3	A	E	1	3	5	2	–	2			■	■	●	●	●	●				
						310	2000	3	A	E	1	3	5	2	–	4			■	■	●	●	●	●				
24	125	50	20	50/52	210	310	800	3	A	E	1	3	2	3	–	1			■	■	●	●	●	●				
						310	1250	3	A	E	1	3	2	3	–	2			■	■	●	●	●	●				
						310	2000	3	A	E	1	3	2	3	–	4			■	■	●	●	●	●				
						310	2500	3	A	E	1	3	2	3	–	6			■	■	●	●	●	●				
					275	310	800	3	A	E	1	3	5	3	–	1			■	■	●	●	●	●				
						310	1250	3	A	E	1	3	5	3	–	2			■	■	●	●	●	●				
						310	2000	3	A	E	1	3	5	3	–	4			■	■	●	●	●	●				
						310	2500	3	A	E	1	3	5	3	–	6			■	■	●	●	●	●				
24	125	50	25	63/65	210	310	800	3	A	E	1	3	2	4	–	1			■	■	●	●	●	●				
						310	1250	3	A	E	1	3	2	4	–	2			■	■	●	●	●	●				
						310	2000	3	A	E	1	3	2	4	–	4			■	■	●	●	●	●				
						310	2500	3	A	E	1	3	2	4	–	6			■	■	●	●	●	●				
					275	310	800	3	A	E	1	3	5	4	–	1			■	■	●	●	●	●				
						310	1250	3	A	E	1	3	5	4	–	2			■	■	●	●	●	●				
						310	2000	3	A	E	1	3	5	4	–	4			■	■	●	●	●	●				
						310	2500	3	A	E	1	3	5	4	–	6			■	■	●	●	●	●				
Special version U_d = 55 kV																										–	Z	E 5 5[1]
Special version U_d = 65 kV																										–	Z	E 6 5[2]
Circuit breaker for installation in NXAIR World [3]																												
24	125	50	25	63/65	210	310	1250	3	A	E	1	7	1	4	–	2			■							–	Z	W 6 3
					275	310	2000	3	A	E	1	7	4	4	–	4			■							–	Z	W 6 3
						310	2500	3	A	E	1	7	4	4	–	6			■							–	Z	W 6 3
Special version U_d = 55 kV																										–	Z	E 5 5[1]

[1] With special version E55 (selection is possible if 13th position is 0, 1, 2, 3 and 5)

[2] With special version E65 (selection is possible if 13th position is 0 and 1)

[3] W63 is absolutely necessary as order code

Legend: ● With contact system
■ Without contact system

*) Can also be ordered without withdrawable part, see page 37, 13th position

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Device selection

Secondary equipment

9th position

Release combination 1)

Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16 – Order codes

Article No.: 3 A E ■ ■ ■ ■ – ■ ■ ■ ■ ■ – ■ ■ ■ ■ – ★ ■ ■ ■

See page 36 (position 11), See page 36 (position 12), See page 38 (position 13), See page 39 (position 14), See page 40 (position 15), See page 41 (★)

1st shunt release	2nd shunt release	3rd shunt release	Undervoltage release	Current-transformer-operated release 0.5 A 2)	Current-transformer-operated release 1.0 A	Current-transformer-operated release with tripping pulse ≥ 0.1 Ws (20 Ω)	9		Order codes
I							A		
I	II						B		
I	II	III					B	Not for 3AE1	– Z F 1 5
I						II	C		
I				II			G		
I					II		H		
I			II				F		
I	III		II				S	Not for 3AE1	
I	II			III			T	Not for 3AE1	
I	II				III		T	Not for 3AE1	– Z A 4 6
I	II					III	T	Not for 3AE1	– Z A 4 5
I				II + III			U	Not for 3AE1	
I			II	III			V	Not for 3AE1	
I			II		III		V	Not for 3AE1	– Z A 4 6
I			II			III	V	Not for 3AE1	– Z A 4 5
			I				E	Not for 3AE5	
			I			II	N	Not for 3AE5	
			I	II			P	Not for 3AE5	
			I		II		Q	Not for 3AE5	
						I	J	Not for 3AE5	
				I			L	Not for 3AE5	
					I		M	Not for 3AE5	

I = position of first release II = position of second release III = position of third release

1) Operating voltage is selected at positions 11 + 12 + order code for 3rd release

2) Special version with 5 A c.t.-operated release: for all circuit breakers (except for retrofit) with 0.5 A c.t.-operated release can be ordered with order code A49 – Z A 4 9

Operating voltage of the 3rd release

Standard voltages		Special voltages		9	Order codes
24 V DC				B/S	– Z J 8 0
48 V DC				B/S	– Z J 8 3
60 V DC				B/S	– Z J 8 4
110 V DC				B/S	– Z J 8 5
220 V DC				B/S	– Z J 8 9
100 V AC	50/60 Hz 3)			B/S	– Z J 9 2
110 V AC	50/60 Hz 3)			B/S	– Z J 9 3
230 V AC	50/60 Hz 3)			B/S	– Z J 9 7
		30 V DC		B/S	– Z J 8 1
		32 V DC		B/S	– Z J 8 2
		120 V DC		B/S	– Z J 8 6
		125 V DC		B/S	– Z J 8 7
		127 V DC		B/S	– Z J 8 8
		240 V DC		B/S	– Z J 9 0
		120 V AC	50/60 Hz 3)	B/S	– Z J 9 5
		125 V AC	50/60 Hz 3)	B/S	– Z J 9 6
		240 V AC	50/60 Hz 3)	B/S	– Z J 9 8

3) The AC frequency 50 or 60 Hz is selected at the 16th position of the article number together with the language (see page 40)

10th position
Operating voltage of the closing solenoid

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16	–		Order codes		
Article No.:	3	A	E	■	■	■	■	–	■	■	■	■	■	–	■	■	■	■	–	★	■	■	■
																See page 38	See page 39	See page 40		See page 41			

Standard voltages		Special voltages		
24 V DC				B
48 V DC				C
60 V DC				D
110 V DC				E
220 V DC				F
100 V AC	50/60 Hz ¹⁾			H
110 V AC	50/60 Hz ¹⁾			J
230 V AC	50/60 Hz ¹⁾			K
		30 V DC		M
		32 V DC		N
		120 V DC		P
		125 V DC		Q
		127 V DC		R
		240 V DC		S
		120 V AC	50/60 Hz ¹⁾	U
		125 V AC	50/60 Hz ¹⁾	V
		240 V AC	50/60 Hz ¹⁾	W

11th position
Operating voltage of the 1st release

Standard voltages		Special voltages				
C.t.-operated release				0	Not for 3AE5	
24 V DC				1		
48 V DC				2		
60 V DC				3		
110 V DC				4		
220 V DC				5		
100 V AC	50/60 Hz ¹⁾			6		
110 V AC	50/60 Hz ¹⁾			7		
230 V AC	50/60 Hz ¹⁾			8		
		30 V DC		9		L 1 A
		32 V DC		9		L 1 B
		120 V DC		9		L 1 C
		125 V DC		9		L 1 D
		127 V DC		9		L 1 E
		240 V DC		9		L 1 F
		120 V AC	50/60 Hz ¹⁾	9		L 1 K
		125 V AC	50/60 Hz ¹⁾	9		L 1 L
		240 V AC	50/60 Hz ¹⁾	9		L 1 M

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1) The AC frequency 50 or 60 Hz is selected at the 16th position of the article number together with the language (see page 40)

12th position
Operating voltage of the 2nd release

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16			Order codes		
Article No.:	3	A	E	■	■	■	■	–	■	■	■	■	■	–	■	■	■	■	–	★	■	■	■
																See page 38	See page 39	See page 40		See page 41			

Standard voltages		Special voltages		12	Order codes
None or c.t.-operated release				0	
24 V DC				1	
48 V DC				2	
60 V DC				3	
110 V DC				4	
220 V DC				5	
100 V AC	50/60 Hz [1]			6	
110 V AC	50/60 Hz [1]			7	
230 V AC	50/60 Hz [1]			8	
		30 V DC		9	M 1 A
		32 V DC		9	M 1 B
		120 V DC		9	M 1 C
		125 V DC		9	M 1 D
		127 V DC		9	M 1 E
		240 V DC		9	M 1 F
		120 V AC	50/60 Hz [1]	9	M 1 K
		125 V AC	50/60 Hz [1]	9	M 1 L
		240 V AC	50/60 Hz [1]	9	M 1 M

[1] The AC frequency 50 or 60 Hz is selected at the 16th position of the article number together with the language (see page 40)

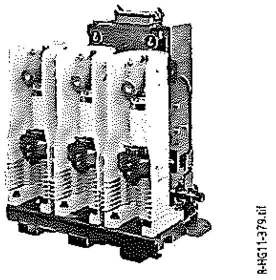
13th position
Circuit breaker installation accessories

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16	–		Order codes		
Article No.:	3	A	E	■	■	■	■	–	■	■	■	■	■	–	■	■	■	■	–	★	■	■	■

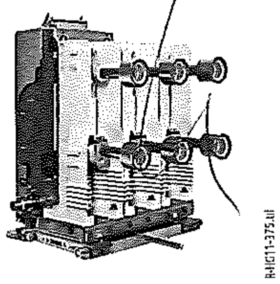
Options	13	See page 38	See page 39	See page 40		See page 41	Order codes
Circuit breaker for fixed mounting							
Without circuit breaker installation accessories, circuit breaker for fixed mounting	0						
Circuit breaker prepared for separate mounting of withdrawable part							
Without withdrawable part, with contact arms, contacts [1], wiring of withdrawable part (loose delivery)	2				–	Z	M 2 2
Without withdrawable part, with contact arms, contacts [1], fixed contacts, bushings, wiring of withdrawable part (supplied loose)	3				–	Z	M 2 3
Circuit breaker on withdrawable part							
On withdrawable part	1						
On withdrawable part, with contact arms, contacts [1]	2						
On withdrawable part, with contact arms, contacts [1], fixed contacts, bushings	3						
Withdrawable module							
Circuit breaker on withdrawable part, with cartridge, contact arms, contacts [1], fixed contacts, bushings, shutters	5						
Circuit breaker on withdrawable part, with cartridge, contact arms, contacts [1], fixed contacts, bushings, shutters, earthing switch with short-circuit making capacity	6						

Not for 3AE5

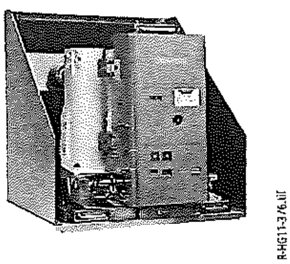
[1] Special version: Contact with 13 contact fingers (only up to 1250 A and 31.5 kA) can be ordered with order code Z-M13



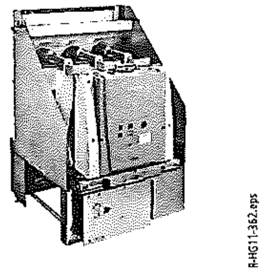
Example: Circuit breaker for fixed mounting



Example: Circuit breaker on withdrawable part with contact arms and contacts



Example: Circuit breaker with withdrawable module



Example: Circuit breaker with withdrawable module and earthing switch

14th position
Operating voltage of the drive motor

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16	–		Order codes		
Article No.:	3	A	E	■	■	■	■	–	■	■	■	■	■	–	■	■	■	■	–	★	■	■	■
																	S. page 39	S. page 40		S. page 41			

Standard voltages	Special voltages	
24 V DC ¹⁾		B
48 V DC		C
60 V DC		D
110 V DC		E
220 V DC		F
100 V AC 50/60 Hz ¹⁾ ²⁾		H
110 V AC 50/60 Hz ¹⁾ ²⁾		J
230 V AC 50/60 Hz ²⁾		K
	30 V DC ¹⁾	M
	32 V DC ¹⁾	N
	120 V DC	P
	125 V DC	Q
	127 V DC	R
	240 V DC	S
	120 V AC 50/60 Hz ²⁾	U
	125 V AC 50/60 Hz ²⁾	V
	240 V AC 50/60 Hz ²⁾	W

1) Does not apply to a rated short-circuit breaking current of 40 kA

2) The AC frequency 50 or 60 Hz is selected at the 16th position of the article number together with the language (see page 40)

15th position

Interlocking, auxiliary switch, circuit breaker tripping signal and low-voltage interface

Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16 Order codes
Article No.: 3 A E ■ ■ ■ ■ – ■ ■ ■ ■ ■ – ■ ■ ■ ■ – ★ ■ ■ ■

See page 40

See page 41

	Auxiliary switch			Low-voltage interface						
Mechanical interlocking	6 NO + 6 NC	12 NO + 12 NC	Circuit breaker tripping signal	27-pole terminal strip 1) (for 3AE1) 20-pole connector strip (for 3AE5)	24-pole plug	64-pole plug		13	15	
If 0 – 6 is selected at the 13th position, circuit breaker / withdrawable module										
	■		■	■				0	B	
	■			■				0	D	
	■		■		■			0	F	
	■				■			0	H	
		■	■	■				0	K	
		■		■				0	M	
		■	■			■		0	R	
		■				■		0	Q	
■	■		■	■					A	
■	■			■					C	
■	■		■		■			0	E	
■	■				■			0	G	
■		■	■	■					J	
■		■		■					L	
■		■	■			■			N	
■		■				■			P	
Same as for N, but with 9 NO + 9 NC							Not for 3AE5	0	U	– Z W 6 3

0 – only for circuit- breaker in fixed-mounted design (if 0 at 13th position)

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Device selection

Secondary equipment

16th position

Languages of operating instructions and rating plate; AC frequency of operating voltages [1]

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16	–		Order codes		
Article No.:	3	A	E	■	■	■	■	–	■	■	■	■	■	–	■	■	■	■	–	★	■	■	■

See page 41

Language selection				Frequency selection		16	Order codes
German	English	French	Spanish	50 Hz DC or AC	60 Hz		
■				■		0	
■					■	1	
	■			■		2	
	■				■	3	
		■		■		4	
		■			■	5	
			■	■		6	
			■		■	7	
Special versions							
Portuguese, 50 Hz or DC						9	R 1 C
Portuguese, 60 Hz						9	R 1 D
Italian, DC or AC 50 Hz						9	R 1 F
Russian, DC or AC 50 Hz						9	R 1 G
Russian, 60 Hz						9	R 1 H
Polish, DC or AC 50 Hz						9	R 1 K
Other languages on request							

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[1] AC voltage refers to the low-voltage equipment

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Additional equipment

Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16 – Order codes
Article No.: 3 A E ■ ■ ■ ■ – ■ ■ ■ ■ ■ – ■ ■ ■ ■ – ★ ■ ■ ■

Options	Circuit breaker 13th position = 0, 1, 2, 3	Withdrawable module 13th position = 5, 6	3AE1	3AE5		Order codes
Wire ends with marking at the plug connector	■	■	■	■		-Z A05
Wiring cables halogen-free and flame-retardant	■	■	■	■		-Z A10
"Destination end marking at wire ends + wire end ferrules pulled out without plug (must be ordered with B01 to B08)"	■		■	■		-Z A11
Wiring cables tinned	■		■	■		-Z A12
Flat connector with insulating sleeve	■	■	■	■		-Z A13
gold-plated auxiliary switch 12 NO + 12 NC and 64-pole plug	■	■	■	■		-Z A21
Anti-condensation heating for 110 V AC, 50 W	■	■	■	■		-Z A29
Anti-condensation heating for 230 V AC, 50 W	■	■	■	■		-Z A30
Version free of silicone emissions	■	■	■	■		-Z A31
Circuit breaker for operation at ambient air temperatures down to -25 °C	■	■	■	■		-Z A40
Electrical closing lockout not together with key-operated interlock	■		■	■		-Z A47
C.t.-operated release 5 A	■	■	■	■		-Z A49
Additional rating plate, supplied loose	■		■	■		-Z B00
Cable harness 800 mm, pulled out	■		■	■		-Z B01
Cable harness 500 mm, pulled out	■		■	■		-Z B02
Cable harness 2000 mm, pulled out	■		■	■		-Z B03
Cable harness 1200 mm, pulled out	■		■	■		-Z B04
Cable harness 1500 mm, pulled out	■		■	■		-Z B05
Cable harness 2500 mm, pulled out (not with 24 V DC control voltage)	■		■	■		-Z B06
Cable harness 3000 mm, pulled out (not with 24 V DC control voltage)	■		■	■		-Z B07
Cable harness 3500 mm, pulled out (not with 24 V DC control voltage)	■		■	■		-Z B08
Cable harness of withdrawable part	■		■	■		-Z B13
Sleeve housing PG21/PG29 at pulled out cable harness (B01-B08) for all versions except 13th position = 7	■	■	■	■		-Z B16
Without upper part of plug	■		■	■		-Z B23
Without supplementary equipment	■		■	■		-Z B24
Close-open solenoids with thermo switch (only valid for 60 V/110 V/220 V DC)	■		■			-Z B47
Cable harness with double insulation for shipbuilding industry	■			■		-Z B58
Special circuit diagram	■		■	■		-Z B99
For aggressive ambient conditions: Gold-plated contacts, tinned pole side, ...	■		■		On request	-Z D20
Withdrawable part with 220 mm racking path	■		■	■		-Z D22
Withdrawable part with 200 mm racking path	■		■	■		-Z D23
Withdrawable part with 180 mm racking path	■		■	■		-Z D24
IP plate	■	■		■		-Z D55
Shaft cover	■	■		■		-Z D56
Wide operating mechanism box[1]				■		-Z D59
Long insulating shell (standard)	■		■	■		-Z D90
Insulating shell (shortened version, for 24 kV)	■		■	■		-Z D91
Insulating shell, width across flats 275 mm for GT system	■			■		-Z D92
Insulating shell for Minis system	■		■	■		-Z D93
Insulating shell to contact arm side (completely shortened)	■			■		-Z D94
Insulating shell to contact arm side (special version for NXAIR World and 3AE5)	■			■		-Z D95
Rated short-duration power-frequency withstand voltage 42 kV (at 12 kV)	■	■	■	■		-Z E13

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[1] For further options, see page 17

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Device selection

Additional equipment

Additional equipment

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16			Order codes		
Article No.:	3	A	E	■	■	■	■	–	■	■	■	■	■	–	■	■	■	■	–	★	■	■	■

Options	Circuit breaker 13th position = 0, 1, 2, 3	Withdrawable module 13th position = 5, 6	3AE1	3AE5	Order codes
Rated short-duration power-frequency withstand voltage 32 kV (at 7.2 kV)	■	■	■	■	- Z E 1 6
Rated short-circuit breaking current I_{sc} = 26.3 kA (only possible with 7.2 kV, 25 kA and 12 kV, 25 kA)	■	■		■	- Z E 4 6
Rated short-duration power-frequency withstand voltage 55 kV (at 24 kV)	■	■	■	■	- Z E 5 5
Rated short-duration power-frequency withstand voltage 65 kV (at 24 kV) 1)	■	■	■	■	- Z E 6 5
Rated lightning impulse voltage 95 kV (at 12 kV)	■	■		■	- Z E 9 5
Routine test certificate enclosed with stamp and passport	■		■	■	- Z F 1 9
Routine test certificate enclosed	■	■	■	■	- Z F 2 0
Routine test certificate with stamp and signature	■	■	■	■	- Z F 2 1
Routine test certificate (to orderer)	■	■	■	■	- Z F 2 3
"Hand crank (for manual charging of the closing spring) (scope of supply: one hand crank per circuit breaker)"	■	■	■	■	- Z F 3 0
Hand crank, long (scope of supply: one hand crank per circuit breaker)	■	■	■	■	- Z F 3 1
"Handle for withdrawable part (for racking the circuit breaker on the withdrawable part) (scope of supply: one handle per circuit breaker). Only required when a withdrawable part is ordered"	■	■	■	■	- Z F 3 2
Handle for earthing switch (for operation of the earthing switch on the withdrawable part) (scope of supply: one handle per circuit breaker). Only required when a withdrawable part with earthing switch is ordered		■	■	■	- Z F 3 4
Rated operating sequence O - 0.3 s - CO - 3 min - CO	■	■	■	■	- Z F 3 8
Guide rails for cartridge			■	■	- Z D 3 5
Break time Y1 ≤ 60 ms at rated voltage	■	■	■	■	- Z G 2 2
Closing time T Close < 55 ms	■	■	■	■	- Z G 2 3
Key-operated interlock (for circuit breakers with mechanical interlocking and without A47)	■	■	■	■	- Z J 6 0
SION plug interlock	■		■		- Z J 6 3
Circuit breaker and withdrawable part for switchgear "MALu 12-24"; only relevant ratings; only with 2 at the 13th position; requires insulating shell D93 at 17.5 kV	■		■	■	- Z J 6 4
Contact with 13 contact fingers (up to 1250 A and 31.5 kA), (selection via 13th position)	■	■	■	■	- Z M 1 3
Frequent operation with up to 30,000 operating cycles. For ≥ 2000 A at ≤ 31.5 kA and ≤ 12 kV or 31.5 kA at 17.5 kV	■		■	■	- Z M 3 0
Warranty 24 months	■		■	■	- Z W 7 0
Warranty 36 months	■		■	■	- Z W 7 1
Warranty 60 months	■		■	■	- Z W 7 2
Additional 84-month warranty	■		■	■	- Z W 7 3
Operating instructions and special labels for USA	■	■	■	■	- Z Y 4 0
Other not listed special design (only after consultation with Order Processing at Switchgear Factory Berlin). Specifications additionally in clear text	■		■	■	- Z Y 9 9

1) AC voltage refers to the secondary side and not to the primary part of the circuit breaker

Ordering information for accessories and spare parts

The article numbers in the spare part overviews are valid for currently manufactured vacuum circuit breakers. When mounting parts or spare parts are being ordered for an existing vacuum circuit breaker, always quote the type designation, serial number and the year of manufacture of the circuit breaker to be sure to get the correct parts.

Retrofitting

When releases / solenoids are retrofitted, the article numbers of the mounting parts must also be specified.
For other additional equipment, the required mounting parts are included in the scope of supply.

Spare parts may only be replaced by qualified personnel.

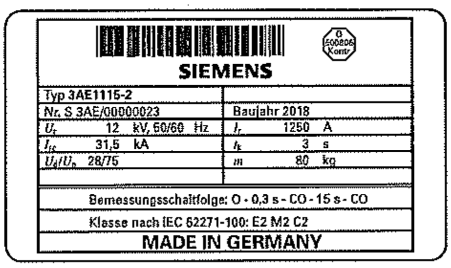
Accessories for the plug connector

Included in the scope of supply of the basic equipment for 3AE vacuum circuit breakers:

For 24-pole plug connector
- Lower part of plug
- Crimp sockets according to number of contacts
- Upper part of plug with screwed contacts (no crimp sockets required)

For 64-pole plug connector
- Lower part of plug
- Upper part of plug
- Crimp sockets according to number of contacts

Rating plate



HG11-2518c_de eps

Note:
The following 3 details are necessary for any query regarding spare parts, subsequent deliveries, etc.:
- Type designation
- Serial No.
- Year of manufacture

Position: 1 - 9

Designation	Description	Feature	Article No.
Handles	Hand crank for circuit breaker		3AX15 30-4B
	Long hand crank for circuit breaker		3AX14 30-2B
	Handle for withdrawable part		3AX14 30-2C
	Handle for earthing switch (for modules up to 31.5 kA)		3AX14 30-2D
	Handle for earthing switch (for 40 kA modules)		3AX14 30-3D
Lubricants	180 g of Klüber-Isoflex Topas L32N		3AX11 33-3H
	1 kg of Klüber-Isoflex Topas L32N		3AX11 33-3E
	1 kg Molykote grease		3AX11 33-2L
	1 kg Vaseline, Atlantic		3AX11 33-4A
Closing solenoid	Used as closing solenoid or 1st shunt release		
	For 3AE1	24 V DC	3AY15 10-5K
	For 3AE1	30/32 V DC	3AY15 10-5M
	For 3AE1	48 V DC	3AY15 10-5C
	For 3AE1	60 V DC	3AY15 10-5D
	For 3AE1	100/124 V DC	3AY15 10-5E
	For 3AE1	125/144 V DC	3AY15 10-5L
	For 3AE1	220/250 V DC	3AY15 10-5F
	For 3AE1	100/125 V AC, 50/60 Hz	3AY15 10-5E
	For 3AE1	230/240 V AC, 50/60 Hz	3AY15 10-5F

Position: 1 – 9

Designation	Description		Feature	Article No.
Closing solenoid (continued)	For 3AE5		24 – 32 V DC	3AY14 10-0B
	For 3AE5		48 V DC	3AY14 10-0C
	For 3AE5		60 V DC	3AY14 10-0D
	For 3AE5		110 – 127 V DC	3AY14 10-0E
	For 3AE5		220 – 240 V DC	3AY14 10-0F
	For 3AE5		100/125 V AC, 50/60 Hz	3AY14 10-0J
	For 3AE5		230/240 V AC, 50/60 Hz	3AY14 10-0K
2nd and 3rd Shunt release	For 3AE1 and 3AE5		24 – 32 V DC	3AX11 01-2B
	For 3AE1 and 3AE5		48 – 60 V DC	3AX11 01-2C
	For 3AE1 and 3AE5		110 – 127 V DC	3AX11 01-2E
	For 3AE1 and 3AE5		220 – 240 V DC	3AX11 01-2F
	For 3AE1 and 3AE5		100 – 125 V AC, 50 Hz	3AX11 01-2G
	For 3AE1 and 3AE5		230 – 240 V AC, 50 Hz	3AX11 01-2J
	For 3AE1 and 3AE5		100 – 125 V AC, 60 Hz	3AX11 01-3G
	For 3AE1 and 3AE5		230 – 240 V AC, 60 Hz	3AX11 01-3J
Current-transformer-operated release	For rated normal current 0.5 A	For 3AE1 and 3AE5		3AX11 02-2A
	For rated normal current 1 A	For 3AE1 and 3AE5		3AX11 02-2B
	For tripping impulse ≥ 0.1 Ws, 20 Ω for 7SJ45 protection relay	For 3AE1 and 3AE5		3AX11 04-2B
	For rated normal current 5 A incl. rectifier	For 3AE1		3AX14 02-2D
	For rated normal current 5 A incl. rectifier	For 3AE5		3AX14 02-2E
Mounting parts	For 2nd shunt release / c.t.-operated release	for 3AE1		3AX14 11-2A
		For 3AE5		3AX14 11-5A
	For 2nd and 3rd release	for 3AE5		3AX14 11-5B
Undervoltage release		For 3AE1 and 3AE5	24 V DC	3AX11 03-2B
		For 3AE1 and 3AE5	30/32 V DC	3AX11 03-2L
		For 3AE1 and 3AE5	48 V DC	3AX11 03-2C
		For 3AE1 and 3AE5	60 V DC	3AX11 03-2D
		For 3AE1 and 3AE5	110 V DC	3AX11 03-2E
		For 3AE1 and 3AE5	120/127 V DC	3AX11 03-2N
		For 3AE1 and 3AE5	220 V DC	3AX11 03-2F
		For 3AE1 and 3AE5	240 V DC	3AX11 03-2P
		For 3AE1 and 3AE5	100 V AC, 50 Hz	3AX11 03-2G
		For 3AE1 and 3AE5	110/125 V AC, 50 Hz	3AX11 03-2H
		For 3AE1 and 3AE5	230 V AC, 50 Hz	3AX11 03-2J
		For 3AE1 and 3AE5	240 V AC, 50 Hz	3AX11 03-2M
		For 3AE1 and 3AE5	100 V AC, 60 Hz	3AX11 03-3G
		For 3AE1 and 3AE5	110/125 V AC, 60 Hz	3AX11 03-3H
		For 3AE1 and 3AE5	230 V AC, 60 Hz	3AX11 03-3J
		For 3AE1 and 3AE5	240 V AC, 60 Hz	3AX11 03-3M
Mounting parts	For undervoltage releases	For 3AE1		3AX14 13-2A
		For 3AE5		3AX14 13-5A
Drive motor		For 3AE1	24/30/32 V DC	3AY17 11-2B
		For 3AE1	48 V DC	3AY17 11-2C
		For 3AE1	60 V DC	3AY17 11-2D
		For 3AE1	100/110/125 V DC/AC	3AY17 11-2E
		For 3AE1	220 - 240 V DC 230 - 240 V AC	3AY17 11-2F
		For 3AE5	24/30/32 V DC	3AY14 11-1B
		For 3AE5	48/60 V DC	3AY14 11-1C
		For 3AE5	110 – 127 V DC 100 – 125 V AC	3AY14 11-1E
		For 3AE5	220 – 240 V DC 220 – 240 V AC	3AY14 11-1F

Position: 1 – 9

Designation	Description		Feature	Article No.
Auxiliary contactor	Type 3RH11 22 For anti-pumping	For 3AE1	24 V DC	SWB: 55656
		For 3AE1	30/32 V DC	SWB: 55658
		For 3AE1	48 V DC	SWB: 55659
		For 3AE1	60 V DC	SWB: 55660
		For 3AE1	110 V DC	SWB: 55661
		For 3AE1	120/127 V DC	SWB: 55662
		For 3AE1	220 V DC	SWB: 55663
		For 3AE1	240/250 V DC	SWB: 55665
		For 3AE1	110 V AC, 50/60 Hz	SWB: 55666
		For 3AE1	120 V AC, 50/60 Hz	SWB: 55667
		For 3AE1	125 V AC, 50/60 Hz	SWB: 55668
		For 3AE1	230 V AC, 50/60 Hz	SWB: 55669
		For 3AE1	240 V AC, 50/60 Hz	SWB: 55670
Electronic module	For 3AE5		24 – 60 V DC	3AY14 20-1B
			110 – 240 V DC 100 – 240 V AC	3AY14 20-1E
Position switches	Type SE4 without mounting accessories			3AX42 06-0A
	Used for:		Quantity	
	– Electrical anti-pumping (-S3)		1	
	– Electrical interlocking (-S12)		1	
	– Motor control (-S21, -S22)		2	
	– Closing spring charged (-S4)		1	
	– Circuit breaker tripping signal (-S6)		1	
	– Electrical closing lock-out (-S5)		1	
	– Withdrawable part (-S1.0 to -S1.9)		10	
	- Key-operated interlock		1	
Auxiliary switches (-S1)	6 NO + 6 NC			3SV92 73-2AA0
	12 NO + 12 NC			3SV92 74-2AA0
Mechanical interlocking		for 3AE1		3AX14 20-2A
		For 3AE1	≤ 12 kV ≤ 25 kA ≤ 1250 A	3AX14 20-2B
Key-operated interlocking		For 3AE1		3AX14 37-3A
		For 3AE1	≤ 12 kV ≤ 25 kA ≤ 1250 A	3AX14 37-3B
	Mounting kit	for 3AE5		3AX14 37-4A
Accessories for Plug connection	Crimp pins (for conductor cross-section 1.5 mm)	For 3AE1 and 3AE5	24-pole	3AX11 34-3A
	Crimp pins (for lower part of plug)	For 3AE1 and 3AE5	64-pole	3AX11 34-4B
	Crimp sockets (for upper part of plug)	For 3AE1 and 3AE5	64-pole	3AX11 34-4C
	Crimping pliers	For 3AE1 and 3AE5		3AX11 34-4D
	Disassembly tool	For 3AE1 and 3AE5		3AX11 34-4G
	Plug connection, complete	For 3AE1 and 3AE5	24-pole	3AX11 34-7A
		For 3AE1 and 3AE5	64-pole	3AX11 34-6A
	Plug connection (lower part)	For 3AE1 and 3AE5	24-pole	3AX11 34-5D
	Plug connection (upper part)	For 3AE1 and 3AE5	24-pole	3AX11 34-5C
	Plug connection (lower part)	For 3AE1 and 3AE5	64-pole	3AX11 34-5B
	Plug connection (upper part)	For 3AE1 and 3AE5	64-pole	3AX11 34-5A
Electrical closing lock-out		For 3AE1 and 3AE5	24 V DC	3AX14 05-2B
		For 3AE1 and 3AE5	30/32 V DC	3AX14 05-2K
		For 3AE1 and 3AE5	48 V DC	3AX14 05-2C
		For 3AE1 and 3AE5	60 V DC	3AX14 05-2D
		For 3AE1 and 3AE5	100/127 V DC	3AX14 05-2E
		For 3AE1 and 3AE5	220/240 V DC	3AX14 05-2F
		For 3AE1 and 3AE5	100 V AC, 50/60 Hz	3AX14 05-2G
		For 3AE1 and 3AE5	100/125 V AC, 50/60 Hz	3AX14 05-2H
		For 3AE1 and 3AE5	220/240 V AC, 50/60 Hz	3AX14 05-2J
Mounting parts	For electrical closing lock-out	For 3AE1		3AX14 15-2A
		For 3AE1	≤ 12 kV ≤ 25 kA ≤ 1250 A	3AX14 15-2L
		For 3AE5		3AX14 15-3A
	Circuit breaker tripping signal	For 3AE1		3AX14 16-2A

Device selection
Accessories and spare parts

Position: 1 – 9

Designation	Description		Feature	Article No.
Bushing complete	Pole-center distance: 150/160 mm	for	7.2 to 17.5 kV, 800 to 1600 A, up to 31.5 kA	3AX14 52-2A
	Pole-center distance: 210 mm	for	7.2 to 17.5 kV, 800 to 1600 A, up to 31.5 kA	3AX14 52-2B
	Pole-center distance: 210 mm	for	7.2 to 17.5 kV, 2000 to 2500 A, up to 31.5 kA	3AX14 52-2C
	Pole-center distance: 210 mm	for	24 kV, 800 to 1250 A, up to 25 kA	3AX14 52-2D
	Pole-center distance: 210 mm	for	24 kV, 2000 to 2500 A, up to 25 kA	3AX14 52-2E
	Pole-center distance: 275 mm	for	24 kV, 800 to 1250 A, up to 25 kA	3AX14 52-2F
	Pole-center distance: 275 mm	for	24 kV, 2000 to 2500 A, up to 25 kA	3AX14 52-2G
	Pole-center distance: 210/275 mm	for	7.2 to 17.5 kV, 1250 to 3150 A, 40 kA	3AX14 52-2H
Top cover for SION 3AE1	Top cover 150/160 mm pole-center distance		13th position = 0	3AX14 70-1A
			13th position – 1 – 6	3AX14 70-1B
			13th position – 1 – 6 with preparation for key-operated interlock (J60)	3AX14 70-1C
			13th position – 0 (neutral)	3AX14 70-1E
			13th position – 1 – 6 (neutral)	3AX14 70-1F
	Top cover 210 mm pole-center distance		13th position = 0	3AX14 70-2A
			13th position – 1 – 6	3AX14 70-2B
			13th position – 1 – 6 with preparation for key-operated interlock (J60)	3AX14 70-2C
			13th position – 0 (neutral)	3AX14 70-2E
			13th position – 1 – 6 (neutral)	3AX14 70-2F
	Top cover 275 mm pole-center distance		13th position = 0	3AX14 70-3A
			13th position – 1 – 6	3AX14 70-3B
			13th position – 1 – 6 with preparation for key-operated interlock (J60)	3AX14 70-3C
			13th position – 0 (neutral)	3AX14 70-3E
			13th position – 1 – 6 (neutral)	3AX14 70-3F
	Side cover 210 mm pole-center distance			3AX14 70-2S
	Side cover 275 mm pole-center distance			3AX14 70-3S
	Cover of low-voltage interface			3AX14 70-0H
Top cover for SION 3AE5	Plastic cover, standard			3AX14 70-5A
	Plastic cover, neutral			3AX14 70-5B
	Metal cover, PCD 150 mm	For 3AE5		3AX14 70-5C
	Metal cover, PCD 160 mm	For 3AE5		3AX14 70-5D
	Metal cover, PCD 210 mm	For 3AE5		3AX14 70-5E
	Metal cover, PCD 275 mm	For 3AE5		3AX14 70-5F
Insulating shell towards contact arm side, for standard circuit breakers only for additional screening in case of narrow installation	Standard version, width across flats 310 mm	For 3AE1	7.2 to 17.5 kV (≤ 31.5 kA)	3AX14 38-2A
	Standard version, width across flats 310 mm (Minis)	For 3AE1	7.2 to 17.5 kV (≤ 31.5 kA)	3AX14 38-4H
	Standard version, width across flats 310 mm	For 3AE1	7.2 to 17.5 kV (40 kA)	3AX14 38-2E
	Standard version, width across flats 275 mm	For 3AE1	7.2 to 17.5 kV	3AX14 38-2C
	Standard version, width across flats 205 mm	For 3AE1	7.2 to 17.5 kV	3AX14 38-2D
	Standard version, width across flats 205 mm (Minis)	For 3AE1	7.2 up to 17.5 kV (≤ 31.5 kA)	3AX14 38-4K
	Standard version, width across flats 310 mm	For 3AE1	24 kV	3AX14 38-2B
	Standard version, width across flats 310 mm	For 3AE1	24 kV	3AX14 38-3B
	Standard version, width across flats 310 mm	For 3AE5	7.2 to 12 kV (≤ 25 kA ≤ 1250 A)	3AX14 38-5A
	Shortened version, width across flats 310 mm	For 3AE5	7.2 to 12 kV (≤ 25 kA ≤ 1250 A)	3AX14 38-6A
	Shortened version, width across flats 310 mm (Minis)	For 3AE5	7.2 to 12 kV (≤ 25 kA ≤ 1250 A)	3AX14 38-7A
	Standard version, width across flats 275 mm	For 3AE5	7.2 to 12 kV (≤ 25 kA ≤ 1250 A)	3AX14 38-5C
	Shortened version, width across flats 275 mm	For 3AE5	7.2 to 12 kV (≤ 25 kA ≤ 1250 A)	3AX14 38-6C
	Standard version, width across flats 205 mm	For 3AE5	7.2 to 12 kV (≤ 25 kA ≤ 1250 A)	3AX14 38-5D
	Shortened version, width across flats 205 mm	For 3AE5	7.2 to 12 kV (≤ 25 kA ≤ 1250 A)	3AX14 38-6D
	Shortened version, width across flats 205 mm (Minis)	For 3AE5	7.2 to 12 kV (≤ 25 kA ≤ 1250 A)	3AX14 38-7D
	Standard version, width across flats 310 mm	For 3AE5	7.2 to 12 kV (31.5 kA ≤1600 A)/17.5 kV (25 kA)	3AX14 38-5K
	Shortened version, width across flats 310 mm (Minis)	For 3AE5	7.2 to 12 kV (31.5 kA ≤1600 A)/17.5 kV (25 kA)	3AX14 38-7K
	Shortened version, width across flats 310 mm	For 3AE5	7.2 to 12 kV (31.5 kA ≤1600 A)/17.5 kV (25 kA)	3AX14 38-6K
	Standard version, width across flats 275 mm	For 3AE5	7.2 to 12 kV (31.5 kA ≤1600 A)/17.5 kV (25 kA)	3AX14 38-5H
	Shortened version, width across flats 275 mm	For 3AE5	7.2 to 12 kV (31.5 kA ≤1600 A)/17.5 kV (25 kA)	3AX14 38-6H
	Standard version, width across flats 205 mm	For 3AE5	7.2 to 12 kV (31.5 kA ≤1600 A)/17.5 kV (25 kA)	3AX14 38-5J

Position: 1 - 9

Designation	Description		Feature	Article No.
	Shortened version, width across flats 205 mm	For 3AE5	7.2 to 12 kV (31.5 kA ≤1600 A)/17.5 kV (25 kA)	3AX14 38-6J
	Shortened version, width across flats 205 mm (Minis)	For 3AE5	7.2 to 12 kV (31.5 kA ≤1600 A)/17.5 kV (25 kA)	3AX14 38-7H
Insulating shell towards contact arm side, for standard circuit breakers only for additional screening in case of narrow installation (continued)	Shortened version, width across flats 205 mm (Ritter)	For 3AE5	7.2 to 12 kV (≤ 31.5 kA ≤ 1600 A)/17.5 kV (25 kA)	3AX14 38-5N
	Standard version (top)	For 3AE5	24 kV	3AX14 38-4B
	Standard version (bottom)	For 3AE5	24 kV	3AX14 38-5B
	Standard version for NXAIR	For 3AE5	7.2 to 12 kV (≤ 25 kA ≤ 1250A)	3AX14 38-5F
	Shortened version for NXAIR	For 3AE5	7.2 to 12 kV (≤ 25 kA ≤ 1250A)	3AX14 38-6F
	Special version for NXAIR (for D95)	For 3AE5	7.2 to 12 kV (≤ 25 kA ≤ 1250A)	3AX14 38-5Q
	Standard version for NXAIR	For 3AE5	7.2 to 12 kV (31.5 kA ≤ 1600 A)/17.5 kV (25 kA)	3AX14 38-6M
	Shortened version for NXAIR	For 3AE5	7.2 to 12 kV (31.5 kA ≤ 1600 A)/17.5 kV (25 kA)	3AX14 38-5M
	Special version for NXAIR (for D95)	For 3AE5	7.2 to 12 kV (31.5 kA ≤ 1600 A)/17.5 kV (25 kA)	3AX14 38-5P
	Shortened version for NXAIR (top)	For 3AE5	24 kV	3AX14 38-6B
	Shortened version for NXAIR (bottom)	For 3AE5	24 kV	3AX14 38-8B
Gate for cartridge	Shortened version			3AX14 52-2B
Contact system	26 contact fingers	For 3AE1 and 3AE5	7.2/12/24 kV, 800 to 1250 A	3AX14 42-2A
	26 contact fingers	For 3AE1 and 3AE5	17.5 kV, 800 to 1250 A	3AX14 42-2B
	26 contact fingers	For 3AE1 and 3AE5	7.2/12/24 kV, up to 3150 A	3AX14 42-2C
	26 contact fingers	For 3AE1 and 3AE5	17.5 kV, up to 3150 A	3AX14 42-2D
	13 contact fingers	For 3AE1 and 3AE5	7.2/12/24 kV, 800 to 1250 A	3AX14 42-2E
	13 contact fingers	For 3AE1 and 3AE5	17.5 kV, 800 to 1250 A	3AX14 42-2F
Contact arm, complete with contact system	Width across flats: all Contact fingers: 26	For 3AE1	7.2/12 kV, up to 31.5 kA, up to 1250 A	3AX14 43-2A
	Width across flats: all Contact fingers: 26	For 3AE1	7.2/12 kV, up to 31.5 kA, up to 2500 A	3AX14 43-2B
	Width across flats: all Contact fingers: 26	For 3AE1	17.5 kV, up to 31.5 kA, up to 1250 A	3AX14 43-2C
	Width across flats: all Contact fingers: 26	For 3AE1	17.5 kV, up to 31.5 kA, up to 2500 A	3AX14 43-2D
	Width across flats: all Contact fingers: 26	For 3AE1	24 kV, up to 25 kA, up to 1250 A	3AX14 43-2E
	Width across flats: all Contact fingers: 26	For 3AE1	24 kV, up to 25 kA, up to 2500 A	3AX14 43-2F
	Width across flats: all Contact fingers: 26	For 3AE1	7.2/12 kV, 40 kA, up to 1250 A	3AX14 43-2G
	Width across flats: all Contact fingers: 26	For 3AE1	7.2/12 kV, 40 kA, up to 3150 A	3AX14 43-2H
	Width across flats: all Contact fingers: 26	For 3AE1	17.5 kV, 40 kA, up to 1250 A	3AX14 43-2J
	Width across flats: all Contact fingers: 26	For 3AE1	17.5 kV, 40 kA, up to 3150 A	3AX14 43-2K
	Width across flats: all Contact fingers: 13	for 3AE1	7.2/12 kV, up to 31.5 kA, up to 1250 A	3AX14 43-2L
	Width across flats: all Contact fingers: 13	for 3AE1	17.5 kV, up to 31.5 kA, up to 1250 A	3AX14 43-2M
	Width across flats: all Contact fingers: 13	for 3AE1 and 3AE5	24 kV, up to 25 kA, up to 1250 A	3AX14 43-2N
	Width across flats: all Contact fingers: 26	for 3AE5	7.2/12 kV, up to 31.5 kA, up to 1600 A	3AX14 43-2P
	Width across flats: all Contact fingers: 26	for 3AE5	17.5 kV, up to 25 kA, up to 1600 A	3AX14 43-2Q
	Width across flats: all Contact fingers: 13	for 3AE5	7.2/12 kV, up to 31.5 kA, up to 1250 A	3AX14 43-2R
	Width across flats: all Contact fingers: 13	for 3AE5	17.5 kV, up to 25 kA, up to 1250 A	3AX14 43-2S
	Width across flats: 205 mm Contact fingers: 26	For 3AE1 (Minis)	7.2/12 kV, up to 31.5 kA, up to 1250 A	3AX14 43-4A
	Width across flats: 310 mm Contact fingers: 26	For 3AE1 (Minis)	7.2/12 kV, up to 31.5 kA, up to 2500 A	3AX14 43-4B
	Width across flats: 205 mm Contact fingers: 26	For 3AE1 (Minis)	17.5 kV, up to 31.5 kA, up to 1250 A	3AX14 43-4C
	Width across flats: 310 mm Contact fingers: 26	For 3AE1 (Minis)	17.5 kV, up to 31.5 kA, up to 2500 A	3AX14 43-4D
	Width across flats: 310 mm Contact fingers: 26	For 3AE1 (Minis)	7.2/12 kV, up to 31.5 kA, up to 1250 A	3AX14 43-4T
	Width across flats: 310 mm Contact fingers: 26	For 3AE1 (Minis)	17.5 kV, up to 31.5 kA, up to 1250 A	3AX14 43-4U
	Width across flats: 310 mm Contact fingers: 26	For 3AE1 (Minis)	7.2/12 kV, 40 kA, up to 1250 A	3AX14 43-4G
	Width across flats: 310 mm Contact fingers: 26	For 3AE1 (Minis)	7.2/12 kV, 40 kA, up to 3150 A	3AX14 43-4H
	Width across flats: 310 mm Contact fingers: 26	For 3AE1 (Minis)	17.5 kV, 40 kA, up to 1250 A	3AX14 43-4J
	Width across flats: 310 mm Contact fingers: 26	For 3AE1 (Minis)	17.5 kV, 40 kA, up to 3150 A	3AX14 43-4K
	Width across flats: 205 mm Contact fingers: 13	For 3AE1 (Minis)	7.2/12 kV, up to 31.5 kA, up to 1250 A	3AX14 43-4L
	Width across flats: 205 mm Contact fingers: 13	For 3AE1 (Minis)	17.5 kV, up to 31.5 kA, up to 1250 A	3AX14 43-4M

Device selection

Accessories and spare parts

Position: 1 – 9

Designation	Description	Feature	Article No.
Contact arm, complete with contact system (continued)	Width across flats: 310 mm Contact fingers: 13 For 3AE1 (Minis)	7.2/12 kV, up to 31.5 kA, up to 1250 A	3AX14 43-4V
	Width across flats: 310 mm Contact fingers: 13 For 3AE1 (Minis)	17.5 kV, up to 31.5 kA, up to 1250 A	3AX14 43-4W
	Width across flats: 205 mm Contact fingers: 26 For 3AE5 (Minis)	7.2/12 kV, up to 31.5 kA, up to 1250 A	3AX14 43-5A
	Width across flats: 205 mm Contact fingers: 26 For 3AE5 (Minis)	17.5 kV, up to 25 kA, up to 1250 A	3AX14 43-5B
	Width across flats: 205 mm Contact fingers: 13 For 3AE5 (Minis)	7.2/12 kV, up to 31.5 kA, up to 1250 A	3AX14 43-5C
	Width across flats: 205 mm Contact fingers: 13 For 3AE5 (Minis)	17.5 kV, up to 25 kA, up to 1250 A	3AX14 43-5D
	Width across flats: 310 mm Contact fingers: 26 For 3AE5 (Minis)	7.2/12 kV, up to 31.5 kA, up to 1600 A	3AX14 43-5G
	Width across flats: 310 mm Contact fingers: 26 For 3AE5 (Minis)	17.5 kV, up to 25 kA, up to 1600 A	3AX14 43-5H
	Width across flats: 310 mm Contact fingers: 13 For 3AE5 (Minis)	7.2/12 kV, up to 31.5 kA, up to 1600 A	3AX14 43-5J
	Width across flats: 310 mm Contact fingers: 13 For 3AE5 (Minis)	17.5 kV, up to 25 kA, up to 1600 A	3AX14 43-5K
Fixed contact	For 3AE1 and 3AE5	7.2/12/17.5 kV, up to 31.5 kA, up to 1250 A	3AX14 44-2A
	For 3AE1 and 3AE5	7.2/12/17.5 kV, up to 31.5 kA, up to 2500 A 7.2/12/17.5 kV, 40 kA, up to 3150 A	3AX14 44-2B
	For 3AE1 and 3AE5	7,2/12/17.5 kV, 40 kA, up to 3150 A (Minis)	3AX14 44-2D
	For 3AE1 and 3AE5	24 kV, up to 25 kA, up to 2500 A	3AX14 44-2C
Conductor bars (1 set each) for earthing switch connection	For 3AE1 and 3AE5		
	150/210 mm pole-center distance, 275 mm width across flats	7.2/12/17.5 kV, up to 31.5 kA, up to 1250 A	3AX14 55-2A
	150 mm pole-center distance, 310 mm width across flats	7.2/12/17.5 kV, up to 31.5 kA, up to 1250 A	3AX14 55-2A
	210 mm pole-center distance, 310 mm width across flats	7.2/12/17.5 kV, up to 31.5 kA, up to 1250 A	3AX14 55-2B
	210 mm pole-center distance, 310 mm width across flats	7.2/12/17.5 kV, up to 31.5 kA, up to 2500 A	3AX14 55-2C
	210 mm pole-center distance, 310 mm width across flats	7.2/12/17.5 kV, 40 kA, up to 3150 A	3AX14 55-2D
	210 mm pole-center distance, 310 mm width across flats	24 kV, up to 25 kA, up to 2150 A	3AX14 55-2E
	275 mm pole-center distance, 310 mm width across flats	24 kV, up to 25 kA, up to 2150 A	3AX14 55-2F
	210 mm pole-center distance, 310 mm width across flats	24 kV, up to 25 kA, up to 2500 A	3AX14 55-2G
	275 mm pole-center distance, 310 mm width across flats	24 kV, up to 25 kA, up to 2500 A	3AX14 55-2H
Metal protection plate (IP plate)	150 mm pole-center distance and $I_{sc} \leq 25$ kA	For 3AE5	3AX14 56-0A
	160 mm pole-center distance and $I_{sc} \leq 25$ kA	For 3AE5	3AX14 56-0B
	210 mm pole-center distance	For 3AE5	3AX14 56-0C
	275 mm pole-center distance	For 3AE5	3AX14 56-0D
	150 mm pole-center distance and $I_{sc} = 31.5$ kA	For 3AE5	3AX14 56-1A
	160 mm pole-center distance and $I_{sc} = 31.5$ kA	For 3AE5	3AX14 56-1B
Shaft cover	150/160 mm pole-center distance	For 3AE5	3AX14 66-0A
	150 mm pole-center distance (Ritter)	For 3AE5	3AX14 66-0C
	210 mm pole-center distance	For 3AE5	3AX14 66-0B
	275 mm pole-center distance	For 3AE5	3AX14 66-0D
PG cable gland		For 3AE1 and 3AE5	3AX14 58-0A
Protection against condensed water	Anti-condensation heating for 230 V AC, 50 W	For 3AE1	3AX14 57-3A
	Anti-condensation heating for 110 V AC, 50 W	For 3AE1	3AX14 57-3B
	Anti-condensation heating for 230 V AC, 50 W	For 3AE5	3AX14 57-5A
	Anti-condensation heating for 110 V AC, 50 W	For 3AE5	3AX14 57-5B

						Position:	1 – 9	10
Designation	Description Rated voltage for 50/60 Hz U_r kV	Rated short-circuit breaking current with 36% DC component I_{sc} kA	Pole-center distance mm	Width across flats mm	Rated normal current I_r A	Travel/ feature	Article No.	Language code *
Withdrawable part	≤ 17.5		150/160			180/without cable harness	3AX71 12-2E	■
	≤ 17.5		150/160			180/with cable harness for 3AE1	3AX71 12-3E	■
	≤ 17.5		150/160			180/with cable harness for 3AE5	3AX71 12-4E	■
	≤ 17.5		150/160			200 / without cable harness	3AX71 12-2G	■
	≤ 17.5		150/160			200 / with cable harness for 3AE1	3AX71 12-3G	■
	≤ 17.5		150/160			200 / with cable harness for 3AE5	3AX71 12-4G	■
	≤ 17.5		150/160			220/without cable harness	3AX71 12-2A	■
	≤ 17.5		150/160			220/with cable harness for 3AE1	3AX71 12-3A	■
	≤ 17.5		150/160			220/with cable harness for 3AE5	3AX71 12-4A	■
	≤ 17.5		200			200 / without cable harness	3AX71 12-2H	■
	≤ 17.5		200			200 / with cable harness for 3AE1	3AX71 12-3H	■
	≤ 17.5		210			180/without cable harness	3AX71 12-2F	■
	≤ 17.5		210			180/with cable harness for 3AE1	3AX71 12-3F	■
	≤ 17.5		210			180/with cable harness for 3AE5	3AX71 12-4F	■
	≤ 17.5		210			200 / with cable harness for 3AE5	3AX71 12-4H	■
	≤ 17.5		210			220/without cable harness	3AX71 12-2B	■
	≤ 17.5		210			220/with cable harness for 3AE1	3AX71 12-3B	■
	≤ 17.5		210			220/with cable harness for 3AE5	3AX71 12-4B	■
	24		210			260/without cable harness	3AX71 12-2C	■
	24		210			260/with cable harness for 3AE1	3AX71 12-3C	■
	24		210			260 / with cable harness for 3AE5	3AX71 12-4C	■
	24		275			260/without cable harness	3AX71 12-2D	■
	24		275			260/with cable harness for 3AE1	3AX71 12-3D	■
	24		275			260 / with cable harness for 3AE5	3AX71 12-4D	■
Cartridge without earthing switch	≤ 17.5	≤ 31.5	150	275	≤ 1250		3AX71 11-5A	■
	≤ 17.5	≤ 31.5	150	310	≤ 1250		3AX71 11-5B	■
	≤ 17.5	≤ 31.5	210	275	≤ 1250		3AX71 11-5C	■
	≤ 17.5	≤ 31.5	210	310	≤ 1250		3AX71 11-5D	■
	≤ 17.5	≤ 31.5	210	310	> 1250		3AX71 11-5G	■
	≤ 17.5	40	210	310	All I_r		3AX71 11-5H	■
	24	≤ 25	210	310	≤ 1250		3AX71 11-5E	■
	24	≤ 25	275	310	≤ 1250		3AX71 11-5F	■
	24	≤ 25	210	310	> 1250		3AX71 11-5J	■
	24	≤ 25	275	310	> 1250		3AX71 11-5K	■

							Position: 1 – 9	10
Designation	Description					Travel/ feature	Article No.	Language code *
	Rated voltage for 50/60 Hz U_r kV	Rated short-circuit breaking current with 36% DC component I_{sc} kA	Pole-center distance mm	Width across flats mm	Rated normal current I_r A			
Cartridge with earthing switch	≤ 17.5	≤ 31.5	150	275	≤ 1250	with partition	3AX71 11-6A	■
	≤ 17.5	≤ 31.5	150	310	≤ 1250	with partition	3AX71 11-6B	■
	≤ 17.5	≤ 31.5	210	275	≤ 1250	without partition	3AX71 11-6C	■
	≤ 17.5	≤ 31.5	210	310	≤ 1250	without partition	3AX71 11-6D	■
	≤ 17.5	≤ 31.5	210	310	> 1250	without partition	3AX71 11-6G	■
	≤ 17.5	40	210	310	All I_r	without partition	3AX71 11-6H	■
	24	≤ 25	210	310	≤ 1250	with partition	3AX71 11-6E	■
	24	≤ 25	275	310	≤ 1250	with partition	3AX71 11-6J	■
	24	≤ 25	210	310	> 1250	without partition	3AX71 11-6F	■
	24	≤ 25	275	310	> 1250	without partition	3AX71 11-6K	■

*) The language of the rating plate is stated in the table. The individual code has to be added to the article number.

A	German
B	English
C	French
D	Spanish
E	Italian
F	Russian
G	Portuguese
H	Polish
Z	Open with Z = ...

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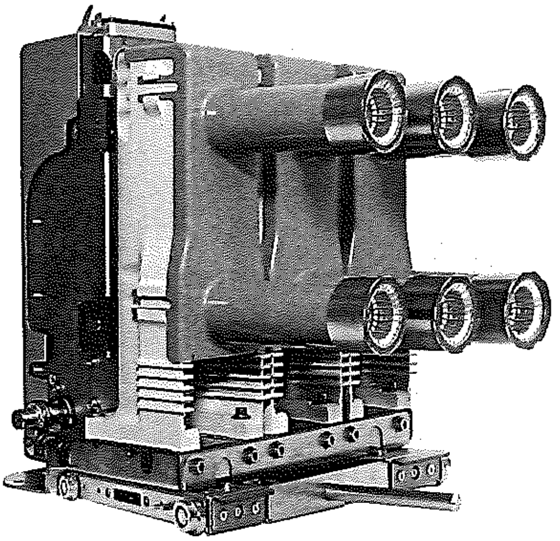
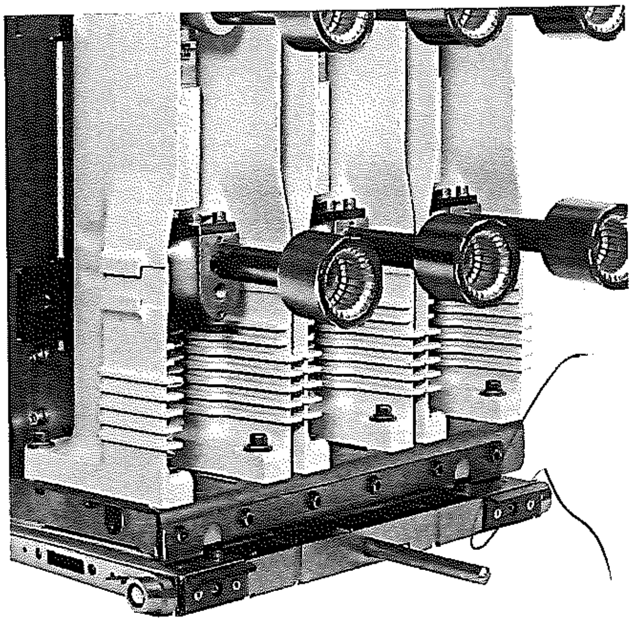


SION vacuum circuit breaker on withdrawable part, with contacts

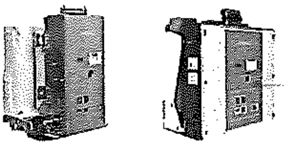


SION vacuum circuit breaker on withdrawable part, with contacts

Contents

Technical data

Electrical data, dimensions and masses for 3AE5



7.2 kV 50/60 Hz Article No.	Rated normal current I_r A	Width across flats mm	Pole-center distance mm	Rated switching sequence: O – 0.3 s – CO – 15 s – CO	Rated short-circuit duration t_k s	Rated short-circuit breaking current I_{sc} kA	DC component in % of the rated short-circuit breaking current %	Asymmetric breaking current kA	Rated short-circuit making current (at 50/60 Hz) I_{ma} kA	Rated back-to-back-capacitor-bank inrush making current I_{bi} kA, peak	Rated lightning impulse voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Voltage drop ΔU between connections (acc. to IEC 62271-1 at 100 A DC) mV	Minimum creepage distance Interrupters mm	Minimum creepage distance Phase-to-earth mm	Minimum clearance Phase-to-phase mm	Minimum clearance Phase-to-earth mm	Mass 1) (fixed-mounted circuit breaker/withdrawable module) kg	Detailed dimension drawing (must be explicitly requested)	Operating cycle diagram no. (see page 58)
3AE5 002-1...	800	205	150	■	3	16	50	17.9	40/42	▲	60	20	3	93	245	93	97	49/–	A7E44202010	1
3AE5 002-2...	1250	205	150	■	3	16	50	17.9	40/42	▲	60	20	3	93	245	93	97	49/–	A7E44202010	1
3AE5 003-1...	800	205	150	■	3	20	50	22.4	50/52	▲	60	20	3	93	245	93	97	49/–	A7E44202010	2
3AE5 003-2...	1250	205	150	■	3	20	50	22.4	50/52	▲	60	20	3	93	245	93	97	49/–	A7E44202010	2
3AE5 004-1...	800	205	150	■	3	25	50	28	63/65	▲	60	20	3	93	245	93	97	49/–	A7E44202010	3a
3AE5 004-2...	1250	205	150	■	3	25	50	28	63/65	▲	60	20	3	93	245	93	97	49/–	A7E44202010	3a
3AE5 005-1...	800	205	150	■	3	31.5	50	35.4	80/82	20	60	20	2.5	90	255	98	97	53.5/–	A7E44202010	4a
3AE5 005-2...	1250	205	150	■	3	31.5	50	35.4	80/82	20	60	20	2.5	90	255	98	97	53.5/–	A7E44202010	4a
3AE5 012-1...	800	275	150	■	3	16	50	17.9	40/42	▲	60	20	3	93	245	93	97	49/85	A7E44202011	1
3AE5 012-2...	1250	275	150	■	3	16	50	17.9	40/42	▲	60	20	3	93	245	93	97	49/85	A7E44202011	1
3AE5 013-1...	800	275	150	■	3	20	50	22.4	50/52	▲	60	20	3	93	245	93	97	49/85	A7E44202011	2
3AE5 013-2...	1250	275	150	■	3	20	50	22.4	50/52	▲	60	20	3	93	245	93	97	49/85	A7E44202011	2
3AE5 014-1...	800	275	150	■	3	25	50	28	63/65	▲	60	20	3	93	245	93	97	49/85	A7E44202011	3a
3AE5 014-2...	1250	275	150	■	3	25	50	28	63/65	▲	60	20	3	93	245	93	97	49/85	A7E44202011	3a
3AE5 015-1...	800	275	150	■	3	31.5	50	35.4	80/82	20	60	20	2.5	90	255	98	122	53.5/89.5	A7E44202011	4a
3AE5 015-2...	1250	275	150	■	3	31.5	50	35.4	80/82	20	60	20	2.5	90	255	98	122	53.5/89.5	A7E44202011	4a
3AE5 022-1...	800	310	150	■	3	16	50	17.9	40/42	▲	60	20	3	93	245	93	97	49/85	A7E44202012	1
3AE5 022-2...	1250	310	150	■	3	16	50	17.9	40/42	▲	60	20	3	93	245	93	97	49/85	A7E44202012	1
3AE5 022-3...	1600	310	150	■	3	16	50	17.9	40/42	20	60	20	2.5	90	255	98	122	59.5/95.5	A7E44202011	1a
3AE5 023-1...	800	310	150	■	3	20	50	22.4	50/52	▲	60	20	3	93	245	93	97	49/85	A7E44202012	2
3AE5 023-2...	1250	310	150	■	3	20	50	22.4	50/52	▲	60	20	3	93	245	93	97	49/85	A7E44202012	2
3AE5 023-3...	1600	310	150	■	3	20	50	22.4	50/52	20	60	20	2.5	90	255	98	122	59.5/95.5	A7E44202012	2a
3AE5 024-1...	800	310	150	■	3	25	50	28	63/65	▲	60	20	3	93	245	93	97	49/85	A7E44202012	3a
3AE5 024-2...	1250	310	150	■	3	25	50	28	63/65	▲	60	20	3	93	245	93	97	49/85	A7E44202012	3a
3AE5 024-3...	1600	310	150	■	3	25	50	28	63/65	20	60	20	2.5	90	255	98	122	59.5/95.5	A7E44202012	3b
3AE5 025-1...	800	310	150	■	3	31.5	50	35.4	80/82	20	60	20	2.5	90	255	98	122	53.5/89.5	A7E44202012	4a
3AE5 025-2...	1250	310	150	■	3	31.5	50	35.4	80/82	20	60	20	2.5	90	255	98	122	53.5/89.5	A7E44202012	4a
3AE5 025-3...	1600	310	150	■	3	31.5	50	35.4	80/82	20	60	20	2.5	90	255	98	122	59.5/95.5	A7E44202012	4a

▲ On request

■ Standard information on rating plate

Note: Dimension drawings from page 79

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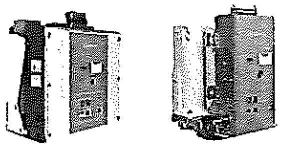
1) The mass of the fixed-mounted circuit breaker, fitted on the withdrawable part, increases by the values specified in the dimension drawing of the withdrawable part (page 83)

Technical data

Electrical data, dimensions and masses for 3AE5



7.2 kV 50/60 Hz Article No.	I_r Rated normal current A	Width across flats mm	Pole-center distance mm	Rated switching sequence: O – 0.3 s – CO – 15 s – CO	t_k Rated short-circuit duration s	I_{sc} Rated short-circuit breaking current kA	DC component in % of the rated short-circuit breaking current %	Asymmetric breaking current kA	I_{ma} Rated short-circuit making current (at 50/60 Hz) kA	I_{bi} Rated back-to-back-capacitor-bank inrush making current kA, peak	U_p Rated lightning impulse voltage kV	U_d Rated short-duration power-frequency with-stand voltage kV	Voltage drop ΔU between connections (acc. to IEC 62271-1 at 100 A DC) mV	Minimum creepage distance Interrupters mm	Minimum creepage distance Phase-to-earth mm	Minimum clearance Phase-to-phase mm	Minimum clearance Phase-to-earth mm	Mass 1) (fixed-mounted circuit breaker/withdrawable module) kg	Detailed dimension drawing (must be explicitly requested)	Operating cycle diagram no. (see page 58)
3AE5 032-1...	800	205	160	■	3	16	50	17.9	40/42	▲	60	20	3	93	245	93	129	49/–	A7E44202016	1
3AE5 032-2...	1250	205	160	■	3	16	50	17.9	40/42	▲	60	20	3	93	245	93	129	49/–	A7E44202016	1
3AE5 033-1...	800	205	160	■	3	20	50	22.4	50/52	▲	60	20	3	93	245	93	129	49/–	A7E44202016	2
3AE5 033-2...	1250	205	160	■	3	20	50	22.4	50/52	▲	60	20	3	93	245	93	129	49/–	A7E44202016	2
3AE5 034-1...	800	205	160	■	3	25	50	28	63/65	▲	60	20	3	93	245	93	129	49/–	A7E44202016	3a
3AE5 034-2...	1250	205	160	■	3	25	50	28	63/65	▲	60	20	3	93	245	93	129	49/–	A7E44202016	3a
3AE5 035-1...	800	205	160	■	3	31.5	50	35.4	80/82	20	60	20	2.5	90	255	98	122	53.5/-	A7E44202016	4a
3AE5 035-2...	1250	205	160	■	3	31.5	50	35.4	80/82	20	60	20	2.5	90	255	98	122	53.5/-	A7E44202016	4a
3AE5 042-1...	800	275	160	■	3	16	50	17.9	40/42	▲	60	20	3	93	245	93	129	49/–	A7E44202017	1
3AE5 042-2...	1250	275	160	■	3	16	50	17.9	40/42	▲	60	20	3	93	245	93	129	49/–	A7E44202017	1
3AE5 043-1...	800	275	160	■	3	20	50	22.4	50/52	▲	60	20	3	93	245	93	129	49/–	A7E44202017	2
3AE5 043-2...	1250	275	160	■	3	20	50	22.4	50/52	▲	60	20	3	93	245	93	129	49/–	A7E44202017	2
3AE5 044-1...	800	275	160	■	3	25	50	28	63/65	▲	60	20	3	93	245	93	129	49/–	A7E44202017	3a
3AE5 044-2...	1250	275	160	■	3	25	50	28	63/65	▲	60	20	3	93	245	93	129	49/–	A7E44202017	3a
3AE5 045-1...	800	275	160	■	3	31.5	50	35.4	80/82	20	60	20	2.5	90	255	98	122	53.5/-	A7E44202017	4a
3AE5 045-2...	1250	275	160	■	3	31.5	50	35.4	80/82	20	60	20	2.5	90	255	98	122	53.5/-	A7E44202017	4a
3AE5 052-1...	800	310	160	■	3	16	50	17.9	40/42	▲	60	20	3	93	245	93	129	49/–	A7E44202018	1
3AE5 052-2...	1250	310	160	■	3	16	50	17.9	40/42	▲	60	20	3	93	245	93	129	49/–	A7E44202018	1
3AE5 052-3...	1600	310	160	■	3	16	50	17.9	40/42	20	60	20	2.5	90	255	98	122	59.5/-	A7E44202018	1a
3AE5 053-1...	800	310	160	■	3	20	50	22.4	50/52	▲	60	20	3	93	245	93	129	49/–	A7E44202018	2
3AE5 053-2...	1250	310	160	■	3	20	50	22.4	50/52	▲	60	20	3	93	245	93	129	49/–	A7E44202018	2
3AE5 053-3...	1600	310	160	■	3	20	50	22.4	50/52	20	60	20	2.5	90	255	98	122	59.5/-	A7E44202018	2a
3AE5 054-1...	800	310	160	■	3	25	50	28	63/65	▲	60	20	3	93	245	93	129	49/–	A7E44202018	3a
3AE5 054-2...	1250	310	160	■	3	25	50	28	63/65	▲	60	20	3	93	245	93	129	49/–	A7E44202018	3a
3AE5 054-3...	1600	310	160	■	3	25	50	28	63/65	20	60	20	2.5	90	255	98	122	59.5/-	A7E44202018	3b
3AE5 055-1...	800	310	160	■	3	31.5	50	35.4	80/82	20	60	20	2.5	90	255	98	122	53.5/-	A7E44202018	4a
3AE5 055-2...	1250	310	160	■	3	31.5	50	35.4	80/82	20	60	20	2.5	90	255	98	122	53.5/-	A7E44202018	4a
3AE5 055-3...	1600	310	160	■	3	31.5	50	35.4	80/82	20	60	20	2.5	90	255	98	122	59.5/-	A7E44202018	4a

▲ On request

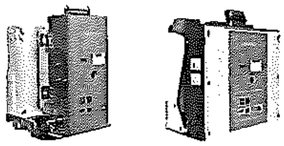
■ Standard information on rating plate

1) The mass of the fixed-mounted circuit breaker, fitted on the withdrawable part, increases by the values specified in the dimension drawing of the withdrawable part (page 83)

555

Technical data

Electrical data, dimensions and masses for 3AE5



7.2 kV 50/60 Hz Article No.	Rated normal current I_r A	Width across flats mm	Pole-center distance mm	Rated switching sequence: O – 0.3 s – CO – 15 s – CO	Rated short-circuit duration t_k s	Rated short-circuit breaking current I_{sc} kA	DC component in % of the rated short-circuit breaking current %	Asymmetric breaking current kA	Rated short-circuit making current (at 50/60 Hz) I_{ma} kA	Rated back-to-back-capacitor-bank inrush making current I_{bi} kA, peak	Rated lightning impulse voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Voltage drop ΔU between connections (acc. to IEC 62271-1 at 100 A DC) mV	Minimum creepage distance interrupters mm	Minimum creepage distance Phase-to-earth mm	Minimum clearance Phase-to-phase mm	Minimum clearance Phase-to-earth mm	Mass 1) (fixed-mounted circuit breaker/withdrawable module) kg	Detailed dimension drawing (must be explicitly requested)	Operating cycle diagram no. (see page 58)
3AE5 062-1...	800	205	210	■	3	16	50	17.9	40/42	▲	60	20	3	93	245	93	129	51.5/91.5	A7E44202022	1
3AE5 062-2...	1250	205	210	■	3	16	50	17.9	40/42	▲	60	20	3	93	245	93	129	51.5/91.5	A7E44202022	1
3AE5 063-1...	800	205	210	■	3	20	50	22.4	50/52	▲	60	20	3	93	245	93	129	51.5/–	A7E44202022	2
3AE5 063-2...	1250	205	210	■	3	20	50	22.4	50/52	▲	60	20	3	93	245	93	129	51.5/–	A7E44202022	2
3AE5 064-1...	800	205	210	■	3	25	50	28	63/65	▲	60	20	3	93	245	93	129	51.5/–	A7E44202022	3a
3AE5 064-2...	1250	205	210	■	3	25	50	28	63/65	▲	60	20	3	93	245	93	129	51.5/–	A7E44202022	3a
3AE5 065-1...	800	205	210	■	3	31.5	50	35.4	80/82	20	60	20	2.5	90	255	98	122	56.5/-	A7E44202022	4a
3AE5 065-2...	1250	205	210	■	3	31.5	50	35.4	80/82	20	60	20	2.5	90	255	98	122	56.5/-	A7E44202022	4a
3AE5 072-1...	800	275	210	■	3	16	50	17.9	40/42	▲	60	20	3	93	245	93	129	51.5/91.5	A7E44202023	1
3AE5 072-2...	1250	275	210	■	3	16	50	17.9	40/42	▲	60	20	3	93	245	93	129	51.5/91.5	A7E44202023	1
3AE5 073-1...	800	275	210	■	3	20	50	22.4	50/52	▲	60	20	3	93	245	93	129	51.5/91.5	A7E44202023	2
3AE5 073-2...	1250	275	210	■	3	20	50	22.4	50/52	▲	60	20	3	93	245	93	129	51.5/91.5	A7E44202023	2
3AE5 074-1...	800	275	210	■	3	25	50	28	63/65	▲	60	20	3	93	245	93	129	51.5/91.5	A7E44202023	3a
3AE5 074-2...	1250	275	210	■	3	25	50	28	63/65	▲	60	20	3	93	245	93	129	51.5/91.5	A7E44202023	3a
3AE5 075-1...	800	275	210	■	3	31.5	50	35.4	80/82	20	60	20	2.5	90	255	98	122	56.5/96.5	A7E44202023	4a
3AE5 075-2...	1250	275	210	■	3	31.5	50	35.4	80/82	20	60	20	2.5	90	255	98	122	56.5/96.5	A7E44202023	4a
3AE5 082-1...	800	310	210	■	3	16	50	17.9	40/42	▲	60	20	3	93	245	93	129	51.5/91.5	A7E44202024	1
3AE5 082-2...	1250	310	210	■	3	16	50	17.9	40/42	▲	60	20	3	93	245	93	129	51.5/91.5	A7E44202024	1
3AE5 082-3...	1600	310	210	■	3	16	50	17.9	40/42	20	60	20	2.5	90	255	98	122	62.5/102.5	A7E44202024	1a
3AE5 083-1...	800	310	210	■	3	20	50	22.4	50/52	▲	60	20	3	93	245	93	129	51.5/91.5	A7E44202024	2
3AE5 083-2...	1250	310	210	■	3	20	50	22.4	50/52	▲	60	20	3	93	245	93	129	51.5/91.5	A7E44202024	2
3AE5 083-3...	1600	310	210	■	3	20	50	22.4	50/52	20	60	20	2.5	90	255	98	122	62.5/102.5	A7E44202024	2a
3AE5 084-1...	800	310	210	■	3	25	50	28	63/65	▲	60	20	3	93	245	93	129	51.5/91.5	A7E44202024	3a
3AE5 084-2...	1250	310	210	■	3	25	50	28	63/65	▲	60	20	3	93	245	93	129	51.5/91.5	A7E44202024	3a
3AE5 084-3...	1600	310	210	■	3	25	50	28	63/65	20	60	20	2.5	90	255	98	122	62.5/102.5	A7E44202024	3b
3AE5 084-4...	2000	310	210	■	3	25	50	30.6	63/65	20	60	20	1.8	130	240	125	138	100	A7E10907000	3c
3AE5 084-6...	2500	310	210	■	3	25	50	30.6	63/65	20	60	20	1.8	130	240	125	138	100	A7E10907000	3c
3AE5 085-1...	800	310	210	■	3	31.5	50	35.4	80/82	20	60	20	2.5	90	255	98	122	56.5/96.5	A7E44202024	4a

▲ On request

■ Standard information on rating plate

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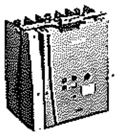
1) The mass of the fixed-mounted circuit breaker, fitted on the withdrawable part, increases by the values specified in the dimension drawing of the withdrawable part (page 83)

556

Technical data

Electrical data, dimensions and masses for 3AE1



7.2 kV 50/60 Hz Article No.	Rated normal current I_r A	Width across flats mm	Pole-center distance mm	Rated switching sequence: O – 0.3 s – CO – 15 s – CO	Rated short-circuit duration t_k s	Rated short-circuit breaking current I_{sc} kA	DC component in % of the rated short-circuit breaking current %	Asymmetric breaking current kA	Rated short-circuit making current (at 50/60 Hz) I_{ma} kA	Rated back-to-back capacitor-bank inrush making current I_{bi} kA, peak	Rated lightning impulse voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Voltage drop ΔU between connections (acc. to IEC 62271-1 at 100 A DC) mV	Minimum creepage distance Interrupters mm	Minimum creepage distance Phase-to-earth mm	Minimum clearance Phase-to-phase mm	Minimum clearance Phase-to-earth mm	Mass 1) (fixed-mounted circuit breaker/withdrawable module) kg	Detailed dimension drawing (must be explicitly requested)	Operating cycle diagram no. (see page 58)
3AE5 085-2...	1250	310	210	■	3	31.5	50	35.4	80/82	20	60	20	2.5	90	255	98	122	56.5/96.5	A7E44202024	4a
3AE5 085-3...	1600	310	210	■	3	31.5	50	35.4	80/82	20	60	20	2.5	90	255	98	122	62.5/102.5	A7E44202024	4a
3AE5 085-4...	2000	310	210	■	3	31.5	50	38.5	80/82	20	60	20	1.8	130	240	125	138	100	A7E10907000	4b
3AE5 085-6...	2500	310	210	■	3	31.5	50	38.5	80/82	20	60	20	1.8	130	240	125	138	100	A7E10907000	4b
3AE1 086-2...	1250	310	210	■	3	40	36	44.9	100/104	10	60	20	1.7	145	155	169	140	120/160	A7E44202070	5
3AE1 086-4...	2000	310	210	■	3	40	36	44.9	100/104	10	60	20	1.0	145	249	149	140	160/210	A7E44202071	5
3AE1 086-6...	2500	310	210	■	3	40	36	44.9	100/104	10	60	20	1.0	145	249	149	140	160/210	A7E44202071	5
3AE1 086-7...	3150	310	210	■	3	40	36	44.9	100/104	10	60	20	1.0	145	249	149	140	160/210	A7E44202071	5

▲ On request

■ Standard information on rating plate

Note: Dimension drawings from page 79

1) The mass of the fixed-mounted circuit breaker, fitted on the withdrawable part, increases by the values specified in the dimension drawing of the withdrawable part (page 83)

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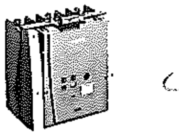
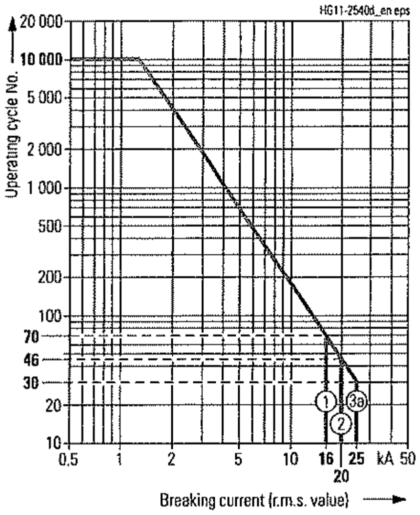
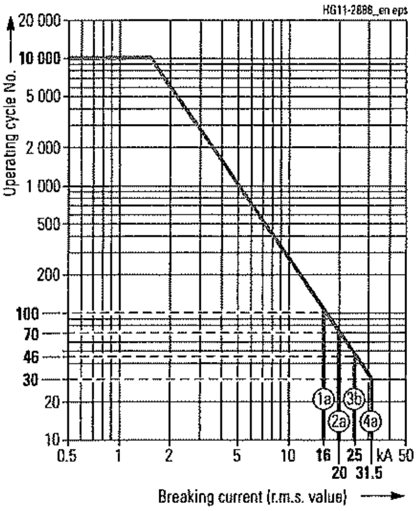
Technical data

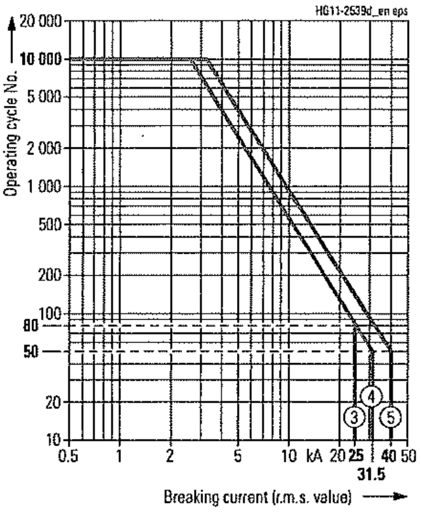
Electrical data, dimensions and masses for 3AE1

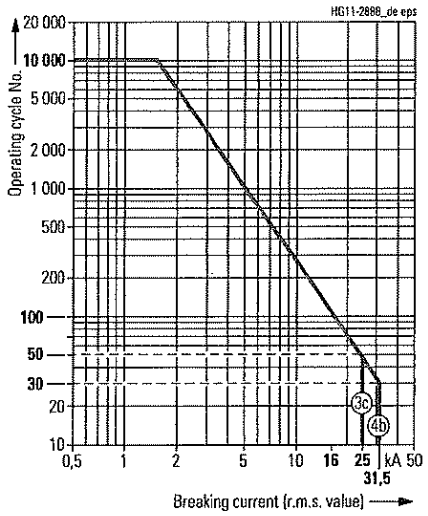


Operating cycle diagrams for 7.2 kV

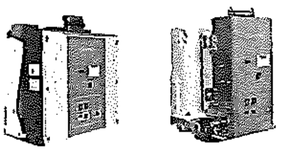








The permissible number of electrical operating cycles is shown as a function of the breaking current (r.m.s. value). All SION vacuum circuit breakers fulfill the endurance classes E2, M2 and C2 according to IEC 62271-100.
The curve shape beyond the parameters defined in IEC 62271-100 is based on average usage data. The number of operating cycles that can actually be reached can be different depending on the respective application.



12 kV 50/60 Hz Article No.	Rated normal current I_r A	Width across flats mm	Pole-center distance mm	Rated switching sequence: O – 0.3 s – CO – 15 s – CO	Rated short-circuit duration t_k s	Rated short-circuit breaking current I_{sc} kA	DC component in % of the rated short-circuit breaking current %	Asymmetric breaking current kA	Rated short-circuit making current (at 50/60 Hz) I_{ma} kA	Rated back-to-back-capacitor-bank inrush making current I_{bi} kA, peak	Rated lightning impulse voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Voltage drop ΔU between connections (acc. to IEC 62271-1 at 100 A DC) mV	Minimum creepage distance Interrupters mm	Minimum creepage distance Phase-to-earth mm	Minimum clearance Phase-to-phase mm	Minimum clearance Phase-to-earth mm	Mass 1) (fixed-mounted circuit breaker/withdrawable module) kg	Detailed dimension drawing (must be explicitly requested)	Operating cycle diagram no. (see page 67)
3AE5 102-1...	800	205	150	■	3	16	50	17.9	40/42	▲	75	28	3	93	245	93	129	49/–	A7E44202010	6
3AE5 102-2...	1250	205	150	■	3	16	50	17.9	40/42	▲	75	28	3	93	245	93	129	49/–	A7E44202010	6
3AE5 103-1...	800	205	150	■	3	20	50	22.4	50/52	▲	75	28	3	93	245	93	129	49/–	A7E44202010	7
3AE5 103-2...	1250	205	150	■	3	20	50	22.4	50/52	▲	75	28	3	93	245	93	129	49/–	A7E44202010	7
3AE5 104-1...	800	205	150	■	3	25	50	28	63/65	▲	75	28	3	93	245	93	129	49/–	A7E44202010	8a
3AE5 104-2...	1250	205	150	■	3	25	50	28	63/65	▲	75	28	3	93	245	93	129	49/–	A7E44202010	8a
3AE5 105-1...	800	205	150	■	3	31.5	50	35.4	80/82	20	75	28	2.5	90	255	98	122	53.5/-	A7E44202010	9a
3AE5 105-2...	1250	205	150	■	3	31.5	50	35.4	80/82	20	75	28	2.5	90	255	98	122	53.5/-	A7E44202010	9a
3AE5 112-1...	800	275	150	■	3	16	50	17.9	40/42	▲	75	28	3	93	245	93	129	49/85	A7E44202011	6
3AE5 112-2...	1250	275	150	■	3	16	50	17.9	40/42	▲	75	28	3	93	245	93	129	49/85	A7E44202011	6
3AE5 113-1...	800	275	150	■	3	20	50	22.4	50/52	▲	75	28	3	93	245	93	129	49/85	A7E44202011	7
3AE5 113-2...	1250	275	150	■	3	20	50	22.4	50/52	▲	75	28	3	93	245	93	129	49/85	A7E44202011	7
3AE5 114-1...	800	275	150	■	3	25	50	28	63/65	▲	75	28	3	93	245	93	129	49/85	A7E44202011	8a
3AE5 114-2...	1250	275	150	■	3	25	50	28	63/65	▲	75	28	3	93	245	93	129	49/85	A7E44202011	8a
3AE5 115-1...	800	275	150	■	3	31.5	50	35.4	80/82	20	75	28	2.5	90	255	98	122	53.5/89.5	A7E44202011	9a
3AE5 115-2...	1250	275	150	■	3	31.5	50	35.4	80/82	20	75	28	2.5	90	255	98	122	53.5/89.5	A7E44202011	9a
3AE5 122-1...	800	310	150	■	3	16	50	17.9	40/42	▲	75	28	3	93	245	93	129	49/85	A7E44202012	6
3AE5 122-2...	1250	310	150	■	3	16	50	17.9	40/42	▲	75	28	3	93	245	93	129	49/85	A7E44202012	6
3AE5 122-3...	1600	310	150	■	3	16	50	17.9	40/42	20	75	28	2.5	90	255	98	122	59.5/95.5	A7E44202012	6a
3AE5 123-1...	800	310	150	■	3	20	50	22.4	50/52	▲	75	28	3	93	245	93	129	49/85	A7E44202012	7
3AE5 123-2...	1250	310	150	■	3	20	50	22.4	50/52	▲	75	28	3	93	245	93	129	49/85	A7E44202012	7
3AE5 123-3...	1600	310	150	■	3	20	50	22.4	50/52	20	75	28	2.5	90	255	98	122	59.5/95.5	A7E44202012	7a
3AE5 124-1...	800	310	150	■	3	25	50	28	63/65	▲	75	28	3	93	245	93	129	49/85	A7E44202012	8a
3AE5 124-2...	1250	310	150	■	3	25	50	28	63/65	▲	75	28	3	93	245	93	129	49/85	A7E44202012	8a
3AE5 124-3...	1600	310	150	■	3	25	50	28	63/65	20	75	28	2.5	90	255	98	122	59.5/95.5	A7E44202012	8b

▲ On request

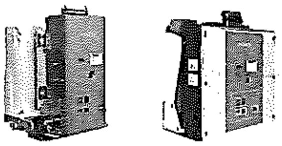
■ Standard information on rating plate

1) The mass of the fixed-mounted circuit breaker, fitted on the withdrawable part, increases by the values specified in the dimension drawing of the withdrawable part (page 83)

559

Technical data

Electrical data, dimensions and masses for 3AE5



12 kV 50/60 Hz Article No.	Rated normal current I_r A	Width across flats mm	Pole-center distance mm	Rated switching sequence: O – 0.3 s – CO – 15 s – CO	Rated short-circuit duration t_k s	Rated short-circuit breaking current I_{sc} kA	DC component in % of the rated short-circuit breaking current %	Asymmetric breaking current kA	Rated short-circuit making current (at 50/60 Hz) I_{ma} kA	Rated back-to-back-capacitor-bank inrush making current I_{bi} kA, peak	Rated lightning impulse voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Voltage drop ΔU between connections (acc. to IEC 62271-1 at 100 A DC) mV	Minimum creepage distance Interrupters mm	Minimum creepage distance Phase-to-earth mm	Minimum clearance Phase-to-phase mm	Minimum clearance Phase-to-earth mm	Mass 1) (fixed-mounted circuit breaker/withdrawable module) kg	Detailed dimension drawing (must be explicitly requested)	Operating cycle diagram no. (see page 67)
3AE5 125-1...	800	310	150	■	3	31.5	50	35.4	80/82	20	75	28	2.5	90	255	98	122	53.5/89.5	A7E44202012	9a
3AE5 125-2...	1250	310	150	■	3	31.5	50	35.4	80/82	20	75	28	2.5	90	255	98	122	53.5/89.5	A7E44202012	9a
3AE5 125-3...	1600	310	150	■	3	31.5	50	35.4	80/82	20	75	28	2.5	90	255	98	122	59.5/95.5	A7E44202012	9a
3AE5 132-1...	800	205	160	■	3	16	50	17.9	40/42	▲	75	28	3	93	245	93	129	49/–	A7E44202016	6
3AE5 132-2...	1250	205	160	■	3	16	50	17.9	40/42	▲	75	28	3	93	245	93	129	49/–	A7E44202016	6
3AE5 133-1...	800	205	160	■	3	20	50	22.4	50/52	▲	75	28	3	93	245	93	129	49/–	A7E44202016	7
3AE5 133-2...	1250	205	160	■	3	20	50	22.4	50/52	▲	75	28	3	93	245	93	129	49/–	A7E44202016	7
3AE5 134-1...	800	205	160	■	3	25	50	28	63/65	▲	75	28	3	93	245	93	129	49/–	A7E44202016	8a
3AE5 134-2...	1250	205	160	■	3	25	50	28	63/65	▲	75	28	3	93	245	93	129	49/–	A7E44202016	8a
3AE5 135-1...	800	205	160	■	3	31.5	50	35.4	80/82	20	75	28	2.5	90	255	98	122	53.5/-	A7E44202016	9a
3AE5 135-2...	1250	205	160	■	3	31.5	50	35.4	80/82	20	75	28	2.5	90	255	98	122	53.5/-	A7E44202016	9a
3AE5 142-1...	800	275	160	■	3	16	50	17.9	40/42	▲	75	28	3	93	245	93	129	49/–	A7E44202017	6
3AE5 142-2...	1250	275	160	■	3	16	50	17.9	40/42	▲	75	28	3	93	245	93	129	49/–	A7E44202017	6
3AE5 143-1...	800	275	160	■	3	20	50	22.4	50/52	▲	75	28	3	93	245	93	129	49/–	A7E44202017	7
3AE5 143-2...	1250	275	160	■	3	20	50	22.4	50/52	▲	75	28	3	93	245	93	129	49/–	A7E44202017	7
3AE5 144-1...	800	275	160	■	3	25	50	28	63/65	▲	75	28	3	93	245	93	129	49/–	A7E44202017	8a
3AE5 144-2...	1250	275	160	■	3	25	50	28	63/65	▲	75	28	3	93	245	93	129	49/–	A7E44202017	8a
3AE5 145-1...	800	275	160	■	3	31.5	50	35.4	80/82	20	75	28	2.5	90	255	98	122	53.5/-	A7E44202017	9a
3AE5 145-2...	1250	275	160	■	3	31.5	50	35.4	80/82	20	75	28	2.5	90	255	98	122	53.5/-	A7E44202017	9a
3AE5 152-1...	800	310	160	■	3	16	50	17.9	40/42	▲	75	28	3	93	245	93	129	49/–	A7E44202018	6
3AE5 152-2...	1250	310	160	■	3	16	50	17.9	40/42	▲	75	28	3	93	245	93	129	49/–	A7E44202018	6
3AE5 152-3...	1600	310	160	■	3	16	50	17.9	40/42	20	75	28	2.5	90	255	98	122	59.5/-	A7E44202018	6a
3AE5 153-1...	800	310	160	■	3	20	50	22.4	50/52	▲	75	28	3	93	245	93	129	49/–	A7E44202018	7
3AE5 153-2...	1250	310	160	■	3	20	50	22.4	50/52	▲	75	28	3	93	245	93	129	49/–	A7E44202018	7
3AE5 153-3...	1600	310	160	■	3	20	50	22.4	50/52	20	75	28	2.5	90	255	98	122	59.5/-	A7E44202018	7a

▲ On request

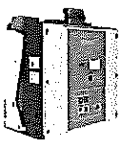
■ Standard information on rating plate

1) The mass of the fixed-mounted circuit breaker, fitted on the withdrawable part, increases by the values specified in the dimension drawing of the withdrawable part (page 83)

560

Technical data

Electrical data, dimensions and masses for 3AE5



12 kV 50/60 Hz Article No.	Rated normal current I_r A	Width across flats mm	Pole-center distance mm	Rated switching sequence: O – 0.3 s – CO – 15 s – CO	Rated short-circuit duration t_k s	Rated short-circuit breaking current I_{sc} kA	DC component in % of the rated short-circuit breaking current %	Asymmetric breaking current kA	Rated short-circuit making current (at 50/60 Hz) I_{ma} kA	Rated back-to-back-capacitor-bank inrush making current I_{bi} kA, peak	Rated lightning impulse voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Voltage drop ΔU between connections (acc. to IEC 62271-1 at 100 A DC) mV	Minimum creepage distance interrupters mm	Minimum creepage distance Phase-to-earth mm	Minimum clearance Phase-to-phase mm	Minimum clearance Phase-to-earth mm	Mass 1) (fixed-mounted circuit breaker/withdrawable module) kg	Detailed dimension drawing (must be explicitly requested)	Operating cycle diagram no. (see page 67)
3AE5 154-1...	800	310	160	■	3	25	50	28	63/65	▲	75	28	3	93	245	93	129	49/–	A7E44202018	8a
3AE5 154-2...	1250	310	160	■	3	25	50	28	63/65	▲	75	28	3	93	245	93	129	49/–	A7E44202018	8a
3AE5 154-3...	1600	310	160	■	3	25	50	28	63/65	20	75	28	2.5	90	255	98	122	59.5/-	A7E44202018	8b
3AE5 155-1...	800	310	160	■	3	31.5	50	35.4	80/82	20	75	28	2.5	90	255	98	122	53.5/-	A7E44202018	9a
3AE5 155-2...	1250	310	160	■	3	31.5	50	35.4	80/82	20	75	28	2.5	90	255	98	122	53.5/-	A7E44202018	9a
3AE5 155-3...	1600	310	160	■	3	31.5	50	35.4	80/82	20	75	28	2.5	90	255	98	122	59.5/-	A7E44202018	9a
3AE5 162-1...	800	205	210	■	3	16	50	17.9	40/42	▲	75	28	3	93	245	93	129	51.5/–	A7E44202022	6
3AE5 162-2...	1250	205	210	■	3	16	50	17.9	40/42	▲	75	28	3	93	245	93	129	51.5/–	A7E44202022	6
3AE5 163-1...	800	205	210	■	3	20	50	22.4	50/52	▲	75	28	3	93	245	93	129	51.5/–	A7E44202022	7
3AE5 163-2...	1250	205	210	■	3	20	50	22.4	50/52	▲	75	28	3	93	245	93	129	51.5/–	A7E44202022	7
3AE5 164-1...	800	205	210	■	3	25	50	28	63/65	▲	75	28	3	93	245	93	129	49/–	A7E44202022	8a
3AE5 164-2...	1250	205	210	■	3	25	50	28	63/65	▲	75	28	3	93	245	93	129	49/–	A7E44202022	8a
3AE5 165-1...	800	205	210	■	3	31.5	50	35.4	80/82	20	75	28	2.5	90	255	98	122	56.5/-	A7E44202022	9a
3AE5 165-2...	1250	205	210	■	3	31.5	50	35.4	80/82	20	75	28	2.5	90	255	98	122	56.5/-	A7E44202022	9a
3AE5 172-1...	800	275	210	■	3	16	50	17.9	40/42	▲	75	28	3	93	245	93	129	51.5/91.5	A7E44202023	6
3AE5 172-2...	1250	275	210	■	3	16	50	17.9	40/42	▲	75	28	3	93	245	93	129	51.5/91.5	A7E44202023	6
3AE5 173-1...	800	275	210	■	3	20	50	22.4	50/52	▲	75	28	3	93	245	93	129	51.5/91.5	A7E44202023	7
3AE5 173-2...	1250	275	210	■	3	20	50	22.4	50/52	▲	75	28	3	93	245	93	129	51.5/91.5	A7E44202023	7
3AE5 174-1...	800	275	210	■	3	25	50	28	63/65	▲	75	28	3	93	245	93	129	51.5/91.5	A7E44202023	8a
3AE5 174-2...	1250	275	210	■	3	25	50	28	63/65	▲	75	28	3	93	245	93	129	51.5/91.5	A7E44202023	8a
3AE5 175-1...	800	275	210	■	3	31.5	50	35.4	80/82	20	75	28	2.5	90	255	98	122	56.5/96.5	A7E44202023	9a
3AE5 175-2...	1250	275	210	■	3	31.5	50	35.4	80/82	20	75	28	2.5	90	255	98	122	56.5/96.5	A7E44202023	9a
3AE5 182-1...	800	310	210	■	3	16	50	17.9	40/42	▲	75	28	3	93	245	93	129	51.5/91.5	A7E44202024	6
3AE5 182-2...	1250	310	210	■	3	16	50	17.9	40/42	▲	75	28	3	93	245	93	129	51.5/91.5	A7E44202024	6
3AE5 182-3...	1600	310	210	■	3	16	50	17.9	40/42	20	75	28	2.5	90	255	98	122	62.5/102.5	A7E44202024	6a

▲ On request

■ Standard information on rating plate

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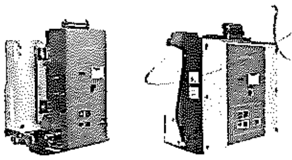
1) The mass of the fixed-mounted circuit breaker, fitted on the withdrawable part, increases by the values specified in the dimension drawing of the withdrawable part (page 83)

Technical data

Electrical data, dimensions and masses for 3AE5



12 kV 50/60 Hz Article No.	Rated normal current I_r A	Width across flats mm	Pole-center distance mm	Rated switching sequence: O – 0.3 s – CO – 15 s – CO	Rated short-circuit duration t_k s	Rated short-circuit breaking current I_{sc} kA	DC component in % of the rated short-circuit breaking current %	Asymmetric breaking current kA	Rated short-circuit making current (at 50/60 Hz) I_{ma} kA	Rated back-to-back-capacitor-bank inrush making current I_{bi} kA, peak	Rated lightning impulse voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Voltage drop ΔU between connections (acc. to IEC 62271-1 at 100 A DC) mV	Minimum creepage distance Interrupters mm	Minimum creepage distance Phase-to-earth mm	Minimum clearance Phase-to-phase mm	Minimum clearance Phase-to-earth mm	Mass 1) (fixed-mounted circuit breaker/withdrawable module) kg	Detailed dimension drawing (must be explicitly requested)	Operating cycle diagram no. (see page 67)
3AE5 183-1...	800	310	210	■	3	20	50	22.4	50/52	▲	75	28	3	93	245	93	129	51.5/91.5	A7E44202024	7
3AE5 183-2...	1250	310	210	■	3	20	50	22.4	50/52	▲	75	28	3	93	245	93	129	51.5/91.5	A7E44202024	7
3AE5 183-3...	1600	310	210	■	3	20	50	22.4	50/52	20	75	28	2.5	90	255	98	122	62.5/102.5	A7E44202024	7a
3AE5 183-4...	2000	310	210	■	3	20	50	24.5	50/52	20	75	28	1.8	130	240	125	138	100	A7E10907000	7b
3AE5 183-6...	2500	310	210	■	3	20	50	24.5	50/52	20	75	28	1.8	130	240	125	138	100	A7E10907000	7b
3AE5 184-1...	800	310	210	■	3	25	50	28	63/65	▲	75	28	3	93	245	93	129	51.5/91.5	A7E44202024	8a
3AE5 184-2...	1250	310	210	■	3	25	50	28	63/65	▲	75	28	3	93	245	93	129	51.5/91.5	A7E44202024	8a
3AE5 184-3...	1600	310	210	■	3	25	50	28	63/65	20	75	28	2.5	90	255	98	122	62.5/102.5	A7E44202024	8b
3AE5 184-4...	2000	310	210	■	3	25	50	30.6	63/65	20	75	28	1.8	130	240	125	138	100	A7E10907000	8c
3AE5 184-6...	2500	310	210	■	3	25	50	30.6	63/65	20	75	28	1.8	130	240	125	138	100	A7E10907000	8c
3AE5 185-1...	800	310	210	■	3	31.5	50	35.4	80/82	20	75	28	2.5	90	255	98	122	56.5/96.5	A7E44202024	9a
3AE5 185-2...	1250	310	210	■	3	31.5	50	35.4	80/82	20	75	28	2.5	90	255	98	122	56.5/96.5	A7E44202024	9a
3AE5 185-3...	1600	310	210	■	3	31.5	50	35.4	80/82	20	75	28	2.5	90	255	98	122	62.5/102.5	A7E44202024	9a
3AE5 185-4...	2000	310	210	■	3	31.5	50	38.6	80/82	20	75	28	1.8	130	240	125	138	100	A7E10907000	9b
3AE5 185-6...	2500	310	210	■	3	31.5	50	38.6	80/82	20	75	28	1.8	130	240	125	138	100	A7E10907000	9b
3AE5 554-1...	800	275	160	■	3	25	50	44.9	63/65	▲	75	28	3	93	245	93	129	49/–	A7E44202024	8a
3AE5 554-2...	1250	275	160	■	3	25	50	44.9	63/65	▲	75	28	3	93	245	93	129	49/–	A7E44202024	8a
3AE5 555-1...	800	275	160	■	3	31.5	50	35.4	80/82	20	75	28	2.5	90	255	130	135	66.5/–	A7E44202038	9a
3AE5 555-2...	1250	275	160	■	3	31.5	50	35.4	80/82	20	75	28	2.5	90	255	130	135	66.5/–	A7E44202038	9a
3AE5 564-3...	1600	275	210	■	3	25	50	28.0	63/65	20	75	28	2.5	90	255	98	122	74.5/-	A7E44202040	8b
3AE5 565-2...	1250	275	210	■	3	31.5	50	35.4	80/82	20	75	28	2.5	90	255	130	135	69.5/–	A7E44202040	9a
3AE5 565-3...	1600	275	210	■	3	31.5	50	35.4	80/82	20	75	28	2.5	90	255	130	135	74.5/–	A7E44202040	9a
3AE5 565-6...	2500	275	210	■	3	31.5	50	38.5	80/82	20	75	28	1.8	130	240	125	138	110	A7E10907005	9b
3AE5 583-4...	2000	310	275	■	3	20	50	24.5	50/52	20	75	28	1.8	130	240	190	138	105	A7E10907000	7b
3AE5 583-6...	2500	310	275	■	3	20	50	24.5	50/52	20	75	28	1.8	130	240	190	138	105	A7E10907000	7b
3AE5 584-4...	2000	310	275	■	3	25	50	30.6	63/65	20	75	28	1.8	130	240	190	138	105	A7E10907000	8c
3AE5 584-6...	2500	310	275	■	3	25	50	30.6	63/65	20	75	28	1.8	130	240	190	138	105	A7E10907000	8c
3AE5 585-2...	1250	310	275	■	3	31.5	50	38.6	80/82	20	75	28	2.0	130	240	225	143	105	A7E10907000	9b
3AE5 585-4...	2000	310	275	■	3	31.5	50	38.6	80/82	20	75	28	1.8	130	240	225	138	105	A7E10907000	9b
3AE5 585-6...	2500	310	275	■	3	31.5	50	38.6	80/82	20	75	28	1.8	130	240	225	138	105	A7E10907000	9b

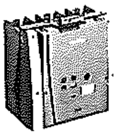
▲ On request

■ Standard information on rating plate

1) The mass of the fixed-mounted circuit breaker, fitted on the withdrawable part, increases by the values specified in the dimension drawing of the withdrawable part (page 83)

Technical data

Electrical data, dimensions and masses for 3AE1



12 kV 50/60 Hz Article No.	Rated normal current I_r A	Width across flats mm	Pole-center distance mm	Rated switching sequence: O – 0.3 s – CO – 15 s – CO	Rated short-circuit duration t_k s	Rated short-circuit breaking current I_{sc} kA	DC component in % of the rated short-circuit breaking current %	Asymmetric breaking current kA	Rated short-circuit making current (at 50/60 Hz) I_{ma} kA	Rated back-to-back-capacitor-bank inrush making current I_{bi} kA, peak	Rated lightning impulse voltage U_p kV	Rated short-duration power-frequency with-stand voltage U_d kV	Voltage drop ΔU between connections (acc. to IEC 62271-1 at 100 A DC) mV	Minimum creepage distance Interrupters mm	Minimum creepage distance Phase-to-earth mm	Minimum clearance Phase-to-phase mm	Minimum clearance Phase-to-earth mm	Mass 1) (fixed-mounted circuit breaker/withdrawable module) kg	Detailed dimension drawing (must be explicitly requested)	Operating cycle diagram no. (see page 67)
3AE1 186-2...	1250	310	210	■	3	40	36	44.9	100/104	10	75	28	1.7	145	155	169	140	120/160	A7E44202070	10
3AE1 186-4...	2000	310	210	■	3	40	36	44.9	100/104	10	75	28	1.0	145	249	149	140	160/210	A7E44202071	10
3AE1 186-6...	2500	310	210	■	3	40	36	44.9	100/104	10	75	28	1.0	145	249	149	140	160/210	A7E44202071	10
3AE1 186-7...	3150	310	210	■	3	40	36	44.9	100/104	10	75	28	1.0	145	249	149	140	160/210	A7E44202071	10
3AE1 566-2...	1250	275	210	■	3	40	36	44.9	100/104	10	75	28	1.7	145	155	169	140	120/–	–	10
3AE1 566-6...	2500	275	210	■	3	40	36	44.9	100/104	10	75	28	1.0	145	249	149	140	160/–	–	10
3AE1 566-7...	3150	275	210	■	3	40	36	44.9	100/104	10	75	28	1.0	145	249	149	140	160/–	–	10
3AE1 586-2...	1250	310	275	■	3	40	36	44.9	100/104	10	75	28	1.7	145	155	234	140	125/165	A7E44202068	10
3AE1 586-4...	2000	310	275	■	3	40	36	44.9	100/104	10	75	28	1.0	145	155	214	140	165/205	A7E44202069	10
3AE1 586-6...	2500	310	275	■	3	40	36	44.9	100/104	10	75	28	1.0	145	155	214	140	165/205	A7E44202069	10
3AE1 586-7...	3150	310	275	■	3	40	36	44.9	100/104	10	75	28	1.0	145	155	214	140	165/205	A7E44202069	10

▲ On request

■ Standard information on rating plate

1) The mass of the fixed-mounted circuit breaker, fitted on the withdrawable part, increases by the values specified in the dimension drawing of the withdrawable part (page 83)

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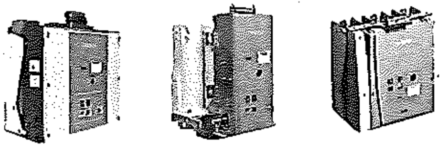
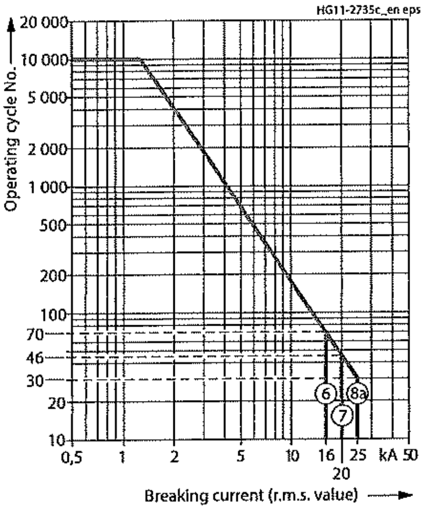
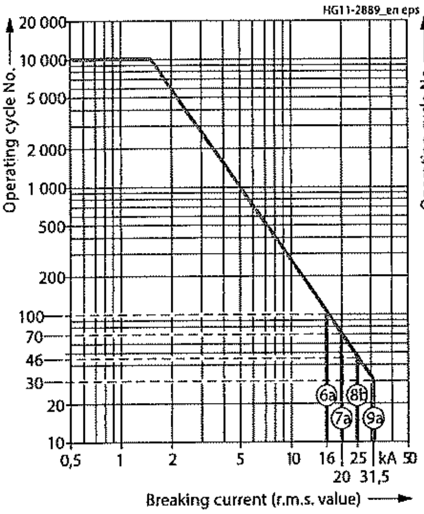
Technical data

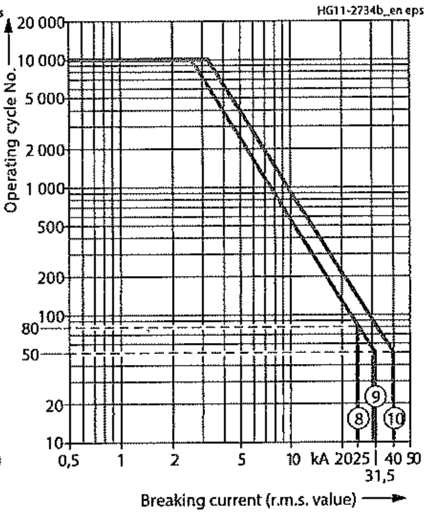
Electrical data, dimensions and masses for 3AE5 and 3AE1

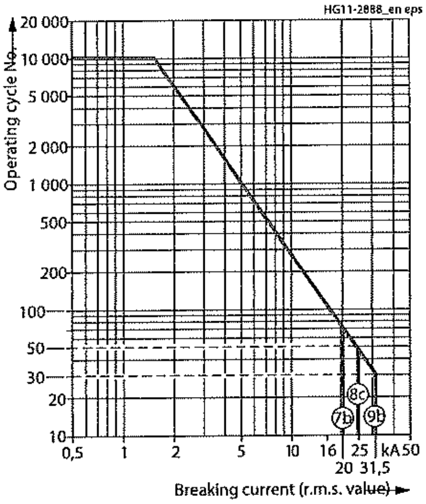


Operating cycle diagrams for 12 kV





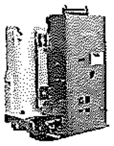


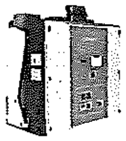


The permissible number of electrical operating cycles is shown as a function of the breaking current (r.m.s. value). All SION vacuum circuit breakers fulfill the endurance classes E2, M2 and C2 according to IEC 62271-100.
The curve shape beyond the parameters defined in IEC 62271-100 is based on average usage data. The number of operating cycles that can actually be reached can be different depending on the respective application.

Technical data

Electrical data, dimensions and masses for 3AE5





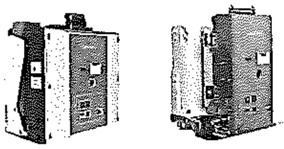
17.5 kV 50/60 Hz Article No.	Rated normal current I_r A	Width across flats mm	Pole-center distance mm	Rated switching sequence: O – 0.3 s – CO – 15 s – CO	Rated short-circuit duration t_k s	Rated short-circuit breaking current I_{sc} kA	DC component in % of the rated short-circuit breaking current %	Asymmetric breaking current kA	Rated short-circuit making current (at 50/60 Hz) I_{ma} kA	Rated back-to-back-capacitor-bank inrush making current I_{bi} kA, peak	Rated lightning impulse voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Voltage drop ΔU between connections (acc. to IEC 62271-1 at 100 A DC) mV	Minimum creepage distance Interrupters mm	Minimum creepage distance Phase-to-earth mm	Minimum clearance Phase-to-phase mm	Minimum clearance Phase-to-earth mm	Mass 1) (fixed-mounted circuit breaker/withdrawable module) kg	Detailed dimension drawing (must be explicitly requested)	Operating cycle diagram no. (see page 75)
3AE5 202-1...	800	205	150	■	3	16	50	17.9	40/42	20	95	38	2.5	240	255	130	135	54/–	A7E44202010	12a
3AE5 202-2...	1250	205	150	■	3	16	50	17.9	40/42	20	95	38	2.5	240	255	130	135	54/–	A7E44202010	12a
3AE5 204-1...	800	205	150	■	3	25	50	28	63/65	20	95	38	2.5	240	255	130	135	54/–	A7E44202010	13a
3AE5 204-2...	1250	205	150	■	3	25	50	28	63/65	20	95	38	2.5	240	255	130	135	54/–	A7E44202010	13a
3AE5 205-1...	800	205	150	■	3	31.5	50	38.6	80/82	20	95	38	2.0	130	240	150	143	83	A7E10907000	14b
3AE5 205-2...	1250	205	150	■	3	31.5	50	38.6	80/82	20	95	38	2.0	130	240	150	143	83	A7E10907000	14b
3AE5 212-1...	800	275	150	■	3	16	50	17.9	40/42	20	95	38	2.5	240	255	130	135	54/94	A7E44202011	12a
3AE5 212-2...	1250	275	150	■	3	16	50	17.9	40/42	20	95	38	2.5	240	255	130	135	54/94	A7E44202011	12a
3AE5 214-1...	800	275	150	■	3	25	50	28	63/65	20	95	38	2.5	240	255	130	135	54/94	A7E44202011	13a
3AE5 214-2...	1250	275	150	■	3	25	50	28	63/65	20	95	38	2.5	240	255	130	135	54/94	A7E44202011	13a
3AE5 215-1...	800	275	150	■	3	31.5	50	38.6	80/82	20	95	38	2.0	130	240	150	143	83	A7E10907000	14b
3AE5 215-2...	1250	275	150	■	3	31.5	50	38.6	80/82	20	95	38	2.0	130	240	150	143	83	A7E10907000	14b
3AE5 222-1...	800	310	150	■	3	16	50	17.9	40/42	20	95	38	2.5	240	255	130	135	54/94	A7E44202012	12a
3AE5 222-2...	1250	310	150	■	3	16	50	17.9	40/42	20	95	38	2.5	240	255	130	135	54/94	A7E44202012	12a
3AE5 222-3...	1600	310	150	■	3	16	50	17.9	40/42	20	95	38	2.5	240	255	130	135	60/100	A7E44202012	12a
3AE5 224-1...	800	310	150	■	3	25	50	28	63/65	20	95	38	2.5	240	255	130	135	54/94	A7E44202012	13a
3AE5 224-2...	1250	310	150	■	3	25	50	28	63/65	20	95	38	2.5	240	255	130	135	54/94	A7E44202012	13a
3AE5 224-3...	1600	310	150	■	3	25	50	28	63/65	20	95	38	2.5	240	255	130	135	60/100	A7E44202012	13a
3AE5 225-1...	800	310	150	■	3	31.5	50	38.6	80/82	20	95	38	2.0	130	240	150	143	83	A7E10907000	14b
3AE5 225-2...	1250	310	150	■	3	31.5	50	38.6	80/82	20	95	38	2.0	130	240	150	143	83	A7E10907000	14b
3AE5 225-3...	1600	310	150	■	3	31.5	50	38.6	80/82	20	95	38	2.0	130	240	150	143	83	A7E10907000	14b
3AE5 232-1...	800	205	160	■	3	16	50	17.9	40/42	20	95	38	2.5	240	255	130	135	54/–	A7E44202016	12a
3AE5 232-2...	1250	205	160	■	3	16	50	17.9	40/42	20	95	38	2.5	240	255	130	135	54/–	A7E44202016	12a
3AE5 234-1...	800	205	160	■	3	25	50	28	63/65	20	95	38	2.5	240	255	130	135	54/–	A7E44202016	13a
3AE5 234-2...	1250	205	160	■	3	25	50	28	63/65	20	95	38	2.5	240	255	130	135	54/–	A7E44202016	13a
3AE5 235-1...	800	205	160	■	3	31.5	50	38.6	80/82	20	95	38	2.0	130	240	160	143	83	A7E10907000	14b
3AE5 235-2...	1250	205	160	■	3	31.5	50	38.6	80/82	20	95	38	2.0	130	240	160	143	83	A7E10907000	14b

■ Standard information on rating plate

1) The mass of the fixed-mounted circuit breaker, fitted on the withdrawable part, increases by the values specified in the dimension drawing of the withdrawable part (page 83)

Technical data

Electrical data, dimensions and masses for 3AE5



17.5 kV 50/60 Hz Article No.	Rated normal current I_r A	Width across flats mm	Pole-center distance mm	Rated switching sequence: O – 0.3 s – CO – 15 s – CO	Rated short-circuit duration t_k s	Rated short-circuit breaking current I_{sc} kA	DC component in % of the rated short-circuit breaking current %	Asymmetric breaking current kA	Rated short-circuit making current (at 50/60 Hz) I_{ma} kA	Rated back-to-back-capacitor-bank inrush making current I_{bi} kA, peak	Rated lightning impulse voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Voltage drop ΔU between connections (acc. to IEC 62271-1 at 100 A DC) mV	Minimum creepage distance Interrupters mm	Minimum creepage distance Phase-to-earth mm	Minimum clearance Phase-to-phase mm	Minimum clearance Phase-to-earth mm	Mass 1) (fixed-mounted circuit breaker/withdrawable module) kg	Detailed dimension drawing (must be explicitly requested)	Operating cycle diagram no. (see page 75)
3AE5 242-1...	800	275	160	■	3	16	50	17.9	40/42	20	95	38	2.5	240	255	130	135	54/-	A7E44202017	12a
3AE5 242-2...	1250	275	160	■	3	16	50	17.9	40/42	20	95	38	2.5	240	255	130	135	54/-	A7E44202017	12a
3AE5 244-1...	800	275	160	■	3	25	50	28	63/65	20	95	38	2.5	240	255	130	135	54/-	A7E44202017	13a
3AE5 244-2...	1250	275	160	■	3	25	50	28	63/65	20	95	38	2.5	240	255	130	135	54/-	A7E44202017	13a
3AE5 245-1...	800	275	160	■	3	31.5	50	38.6	80/82	20	95	38	2.0	130	240	160	143	83	A7E10907000	14b
3AE5 245-2...	1250	275	160	■	3	31.5	50	38.6	80/82	20	95	38	2.0	130	240	160	143	83	A7E10907000	14b
3AE5 252-1...	800	310	160	■	3	16	50	17.9	40/42	20	95	38	2.5	240	255	130	135	54/-	A7E44202018	12a
3AE5 252-2...	1250	310	160	■	3	16	50	17.9	40/42	20	95	38	2.5	240	255	130	135	54/-	A7E44202018	12a
3AE5 252-3...	1600	310	160	■	3	16	50	17.9	40/42	20	95	38	2.5	240	255	130	135	60/-	A7E44202018	12a
3AE5 254-1...	800	310	160	■	3	25	50	28	63/65	20	95	38	2.5	240	255	130	135	54/-	A7E44202018	13a
3AE5 254-2...	1250	310	160	■	3	25	50	28	63/65	20	95	38	2.5	240	255	130	135	54/-	A7E44202018	13a
3AE5 254-3...	1600	310	160	■	3	25	50	28	63/65	20	95	38	2.5	240	255	130	135	60/-	A7E44202018	13a
3AE5 255-1...	800	310	160	■	3	31.5	50	38.6	80/82	20	95	38	2.0	130	240	160	143	83	A7E10907000	14b
3AE5 255-2...	1250	310	160	■	3	31.5	50	38.6	80/82	20	95	38	2.0	130	240	160	143	83	A7E10907000	14b
3AE5 255-3...	1600	310	160	■	3	31.5	50	38.5	80/82	20	95	38	2.0	130	240	160	143	83	A7E10907000	14b
3AE5 262-1...	800	205	210	■	3	16	50	17.9	40/42	20	95	38	2.5	240	255	130	135	57/-	A7E44202022	12a
3AE5 262-2...	1250	205	210	■	3	16	50	17.9	40/42	20	95	38	2.5	240	255	130	135	57/-	A7E44202022	12a
3AE5 264-1...	800	205	210	■	3	25	50	28	63/65	20	95	38	2.5	240	255	130	135	57/-	A7E44202022	13a
3AE5 264-2...	1250	205	210	■	3	25	50	28	63/65	20	95	38	2.5	240	255	130	135	57/-	A7E44202022	13a
3AE5 265-1...	800	205	210	■	3	31.5	50	38.6	80/82	20	95	38	2.0	130	240	210	143	88	A7E10907000	14b
3AE5 265-2...	1250	205	210	■	3	31.5	50	38.6	80/82	20	95	38	2.0	130	240	210	143	88	A7E10907000	14b
3AE5 272-1...	800	275	210	■	3	16	50	17.9	40/42	20	95	38	2.5	240	255	130	135	57/97	A7E44202023	12a
3AE5 272-2...	1250	275	210	■	3	16	50	17.9	40/42	20	95	38	2.5	240	255	130	135	57/97	A7E44202023	12a
3AE5 274-1...	800	275	210	■	3	25	50	28	63/65	20	95	38	2.5	240	255	130	135	57/97	A7E44202023	13a
3AE5 274-2...	1250	275	210	■	3	25	50	28	63/65	20	95	38	2.5	240	255	130	135	57/97	A7E44202023	13a
3AE5 275-1...	800	275	210	■	3	31.5	50	38.6	80/82	20	95	38	2.0	130	240	210	143	88	A7E10907000	14b
3AE5 275-2...	1250	275	210	■	3	31.5	50	38.6	80/82	20	95	38	2.0	130	240	210	143	88	A7E10907000	14b

■ Standard information on rating plate

1) The mass of the fixed-mounted circuit breaker, fitted on the withdrawable part, increases by the values specified in the dimension drawing of the withdrawable part (page 83)

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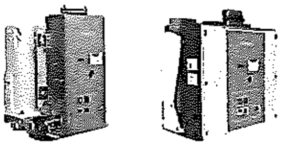
Technical data

Electrical data, dimensions and masses for 3AE5



17.5 kV and NXAIR 50/60 Hz Article No.	Rated normal current I_r A	Width across flats mm	Pole-center distance mm	Rated switching sequence: O – 0.3 s – CO – 15 s – CO	Rated short-circuit duration t_k s	Rated short-circuit breaking current I_{sc} kA	DC component in % of the rated short-circuit breaking current %	Asymmetric breaking current kA	Rated short-circuit making current (at 50/60 Hz) I_{ma} kA	Rated back-to-back-capacitor-bank inrush making current I_{bi} kA, peak	Rated lightning impulse voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Voltage drop ΔU between connections (acc. to IEC 62271-1 at 100 A DC) mV	Minimum creepage distance Interrupters mm	Minimum creepage distance Phase-to-earth mm	Minimum clearance Phase-to-phase mm	Minimum clearance Phase-to-earth mm	Mass 1) (fixed-mounted circuit breaker/withdrawable module) kg	Detailed dimension drawing (must be explicitly requested)	Operating cycle diagram no. (see page 75)
3AE5 282-1...	800	310	210	■	3	16	50	17.9	40/42	20	95	38	2.5	240	255	130	135	57/97	A7E44202024	12a
3AE5 282-2...	1250	310	210	■	3	16	50	17.9	40/42	20	95	38	2.5	240	255	130	135	57/97	A7E44202024	12a
3AE5 282-3...	1600	310	210	■	3	16	50	17.9	40/42	20	95	38	2.5	240	255	130	135	63/103	A7E44202024	12a
3AE5 284-1...	800	310	210	■	3	25	50	28	63/65	20	95	38	2.5	240	255	130	135	57/97	A7E44202024	13a
3AE5 284-2...	1250	310	210	■	3	25	50	28	63/65	20	95	38	2.5	240	255	130	135	57/97	A7E44202024	13a
3AE5 284-3...	1600	310	210	■	3	25	50	28	63/65	20	95	38	2.5	240	255	130	135	63/103	A7E44202024	13a
3AE5 284-4...	2000	310	210	■	3	25	50	30.6	63/65	20	95	38	1.8	130	240	196	138	100	A7E10907000	13b
3AE5 284-6...	2500	310	210	■	3	25	50	30.6	63/65	20	95	38	1.8	130	240	196	138	100	A7E10907000	13b
3AE5 285-1...	800	310	210	■	3	31.5	50	38.6	80/82	20	95	38	2.0	130	240	210	143	88	A7E10907000	14b
3AE5 285-2...	1250	310	210	■	3	31.5	50	38.6	80/82	20	95	38	2.0	130	240	210	143	88	A7E10907000	14b
3AE5 285-3...	1600	310	210	■	3	31.5	50	38.6	80/82	20	95	38	2.0	130	240	210	143	88	A7E10907000	14b
3AE5 285-4...	2000	310	210	■	3	31.5	50	38.6	80/82	20	95	38	1.8	130	240	196	138	105	A7E10907000	14a
3AE5 285-6...	2500	310	210	■	3	31.5	50	38.6	80/82	20	95	38	1.8	130	240	196	138	105	A7E10907000	14a
3AE5 624-1...	800	275	160	■	3	25	50	28	63/65	20	95	38	2.5	240	255	130	135	67/–	A7E44202038	13a
3AE5 624-2...	1250	275	160	■	3	25	50	28	63/65	20	95	38	2.5	240	255	130	135	67/–	A7E44202038	13a
3AE5 625-1...	800	275	160	■	3	31.5	50	35.4	80/82	20	95	38	2	130	240	160	143	85	A7E10907005	14b
3AE5 625-2...	1250	275	160	■	3	31.5	50	35.4	80/82	20	95	38	2	130	240	160	143	85	A7E10907005	14b
3AE5 654-4...	2000	310	275	■	3	25	50	30.6	63/65	20	95	38	1.8	130	240	261	138	105	A7E10907000	13b
3AE5 654-6...	2500	310	275	■	3	25	50	30.6	63/665	20	95	38	1.8	130	240	261	138	105	A7E10907000	13b
3AE5 655-2...	1250	310	275	■	3	31.5	50	38.6	80/82	20	95	38	2.0	130	240	275	143	96	A7E10907000	14b
3AE5 655-3...	1600	310	275	■	3	31.5	50	38.6	80/82	20	95	38	2.0	130	240	275	143	96	A7E10907000	14b
3AE5 655-4...	2000	310	275	■	3	31.5	50	38.6	80/82	20	95	38	1.8	130	240	261	138	105	A7E10907000	14a
3AE5 655-6...	2500	310	275	■	3	31.5	50	38.6	80/82	20	95	38	1.8	130	240	261	138	108	A7E10907000	14a
3AE5 664-2...	1250	275	210	■	3	25	50	28	63/65	20	95	38	2.5	240	255	130	135	70/–	A7E44202040	13a
3AE5 664-3...	1600	275	210	■	3	25	50	28	63/65	20	95	38	2.5	240	255	130	135	75/–	A7E44202040	13a
3AE5 665-2...	1250	275	210	■	3	31.5	50	35.4	80/82	20	95	38	2	130	240	196	143	91	A7E10907005	14b
3AE5 665-3...	1600	275	210	■	3	31.5	50	35.4	80/82	20	95	38	2	130	240	196	138	84	A7E10907005	14b
3AE5 665-6...	2500	275	210	■	3	31.5	50	38.5	80/82	20	95	38	1.8	130	240	196	138	110	A7E10907005	14a

■ Standard information on rating plate

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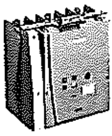
1) The mass of the fixed-mounted circuit breaker, fitted on the withdrawable part, increases by the values specified in the dimension drawing of the withdrawable part (page 83)

Technical data

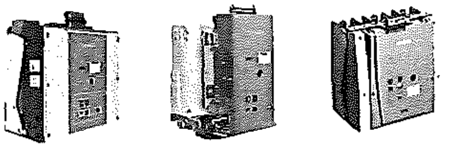
Electrical data, dimensions and masses for 3AE1



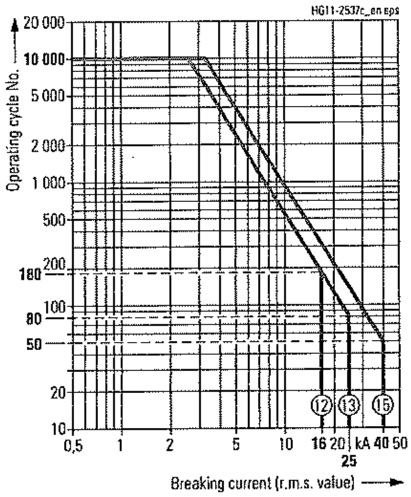
17.5 kV 50/60 Hz Article No.	I_r Rated normal current A	Width across flats mm	Pole-center distance mm	Rated switching sequence: O – 0.3 s – CO – 15 s – CO	t_k Rated short-circuit duration s	I_{sc} Rated short-circuit breaking current kA	DC component in % of the rated short-circuit breaking current %	Asymmetric breaking current kA	I_{ma} Rated short-circuit making current (at 50/60 Hz) kA	I_{bi} Rated back-to-back-capacitor-bank inrush making current kA, peak	U_p Rated lightning impulse voltage kV	U_d Rated short-duration power-frequency withstand voltage kV	Voltage drop ΔU between connections (acc. to IEC 62271-1 at 100 A DC) mV	Minimum creepage distance Interrupters mm	Minimum creepage distance Phase-to-earth mm	Minimum clearance Phase-to-phase mm	Minimum clearance Phase-to-earth mm	Mass [1] (fixed-mounted circuit breaker/withdrawable module) kg	Detailed dimension drawing (must be explicitly requested)	Operating cycle diagram no. (see page 75)
3AE1 286-2...	1250	310	210	■	3	40	36	44.9	100/104	10	95	38	1.7	145	249	169	140	120/160	A7E44202070	15
3AE1 286-4...	2000	310	210	■	3	40	36	44.9	100/104	10	95	38	1.0	145	249	149	140	160/210	A7E44202071	15
3AE1 286-6...	2500	310	210	■	3	40	36	44.9	100/104	10	95	38	1.0	145	249	149	140	160/210	A7E44202071	15
3AE1 286-7...	3150	310	210	■	3	40	36	44.9	100/104	10	95	38	1.0	145	249	149	140	160/210	A7E44202071	15
3AE1 666-2...	1250	275	210	■	3	40	36	44.9	100/104	10	95	38	1.7	145	249	169	140	120/–	–	15
3AE1 666-6...	2500	275	210	■	3	40	36	44.9	100/104	10	95	38	1.0	145	249	149	140	160/–	–	15
3AE1 666-7...	3150	275	210	■	3	40	36	44.9	100/104	10	95	38	1.0	145	249	149	140	160/–	–	15
3AE1 656-2...	1250	310	275	■	3	40	36	44.9	100/104	10	95	38	1.7	145	155	234	140	125/165	A7E44202068	15
3AE1 656-4...	2000	310	275	■	3	40	36	44.9	100/104	10	95	38	1.0	145	155	214	140	165/205	A7E44202069	15
3AE1 656-6...	2500	310	275	■	3	40	36	44.9	100/104	10	95	38	1.0	145	155	214	140	165/205	A7E44202069	15
3AE1 656-7...	3150	310	275	■	3	40	36	44.9	100/104	10	95	38	1.0	145	155	214	140	165/205	A7E44202069	15

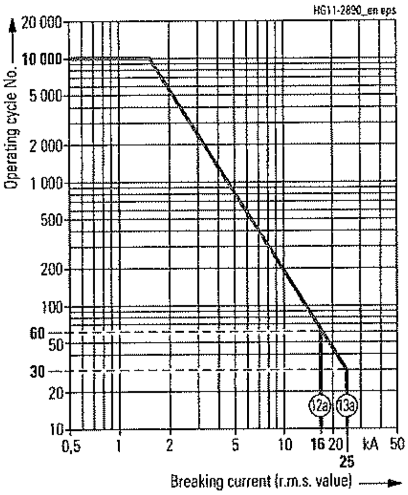
■ Standard information on rating plate

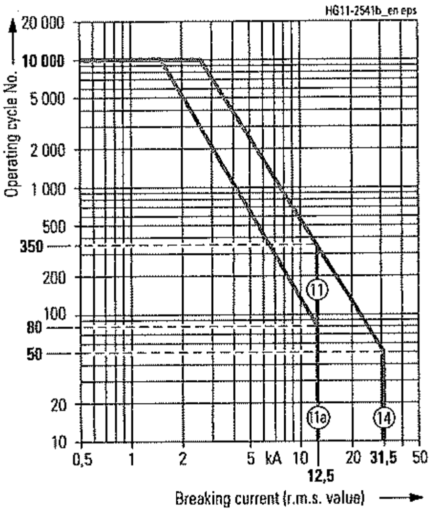
[1] The mass of the fixed-mounted circuit breaker, fitted on the withdrawable part, increases by the values specified in the dimension drawing of the withdrawable part (page 83)

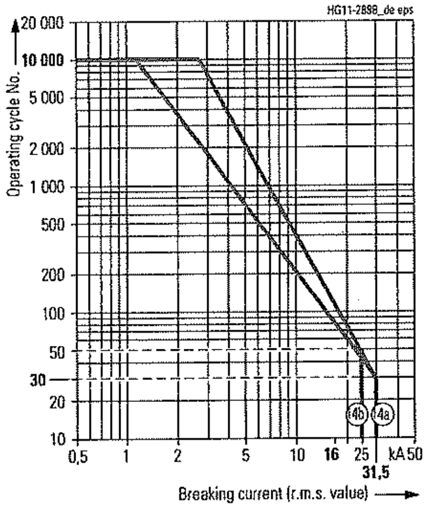


Operating cycle diagrams for 17.5 kV





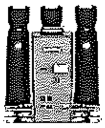




The permissible number of electrical operating cycles is shown as a function of the breaking current (r.m.s. value). All SION vacuum circuit breakers fulfill the endurance classes E2, M2 and C2 according to IEC 62271-100.
The curve shape beyond the parameters defined in IEC 62271-100 is based on average usage data. The number of operating cycles that can actually be reached can be different depending on the respective application.

Technical data

Electrical data, dimensions and masses for 3AE5

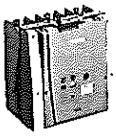


24 kV 50/60 Hz Article No.	Rated normal current I_r A	Width across flats mm	Pole-center distance mm	Rated switching sequence: O – 0.3 s – CO – 15 s – CO	Rated short-circuit duration t_k s	Rated short-circuit breaking current I_{sc} kA	DC component in % of the rated short-circuit breaking current %	Asymmetric breaking current kA	Rated short-circuit making current (at 50/60 Hz) I_{ma} kA	Rated back-to-back-capacitor-bank inrush making current I_{bi} kA, peak	Rated lightning impulse voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Voltage drop ΔU between connections (acc. to IEC 62271-1 at 100 A DC) mV	Minimum creepage distance Interrupters mm	Minimum creepage distance Phase-to-earth mm	Minimum clearance Phase-to-phase mm	Minimum clearance Phase-to-earth mm	Mass 1) (fixed-mounted circuit breaker/withdrawable module) kg	Detailed dimension drawing (must be explicitly requested)	Operating cycle diagram no. (see page 78)
3AE5 321-1...	800	310	210	■	3	12.5	50	14.9	31/33	▲	125	50	3	240	250	180	185	65/105	A7E10950000	16a
3AE5 321-2...	1250	310	210	■	3	12.5	50	14.9	31/33	▲	125	50	3	240	250	180	185	65/105	A7E10950000	16a
3AE5 322-1...	800	310	210	■	3	16	50	17.9	40/42	▲	125	50	3	240	250	180	185	65/105	A7E10950000	17a
3AE5 322-2...	1250	310	210	■	3	16	50	17.9	40/42	▲	125	50	3	240	250	180	185	65/105	A7E10950000	17a
3AE5 323-1...	800	310	210	■	3	20	50	22.4	50/52	▲	125	50	3	240	250	180	185	65/105	A7E10950000	18a
3AE5 323-2...	1250	310	210	■	3	20	50	22.4	50/52	▲	125	50	3	240	250	180	185	65/105	A7E10950000	18a
3AE5 324-1...	800	310	210	■	3	25	50	28	63/65	▲	125	50	3	240	250	180	185	65/105	A7E10950000	19a
3AE5 324-2...	1250	310	210	■	3	25	50	28	63/65	▲	125	50	3	240	250	180	185	65/105	A7E10950000	19a
3AE5 352-1...	800	310	275	■	3	16	50	17.9	40/42	▲	125	50	3	240	250	180	185	68/108	A7E10950000	17a
3AE5 352-2...	1250	310	275	■	3	16	50	17.9	40/42	▲	125	50	3	240	250	245	185	68/108	A7E10950000	17a
3AE5 353-1...	800	310	275	■	3	20	50	22.4	50/52	▲	125	50	3	240	250	245	185	68/108	A7E10950000	18a
3AE5 353-2...	1250	310	275	■	3	20	50	22.4	50/52	▲	125	50	3	240	250	245	185	68/108	A7E10950000	18a
3AE5 354-1...	800	310	275	■	3	25	50	28	63/65	▲	125	50	3	240	250	245	185	68/108	A7E10950000	19a
3AE5 354-2...	1250	310	275	■	3	25	50	28	63/65	▲	125	50	3	240	250	245	185	68/108	A7E10950000	19a
3AE5 714-1...	800	310	210	■	3	25	50	28	63/65	▲	125	50	3	240	250	180	185	65/105	A7E10950000	19a
3AE5 714-0...	1000	310	210	■	3	25	50	28	63/65	▲	125	50	3	240	250	180	185	65/105	A7E10950000	19a
3AE5 714-2...	1250	310	210	■	3	25	50	28	63/65	▲	125	50	3	240	250	180	185	65/105	A7E10950000	19a

▲ On request

■ Standard information on rating plate

1) The mass of the fixed-mounted circuit breaker, fitted on the withdrawable part, increases by the values specified in the dimension drawing of the withdrawable part (page 83)



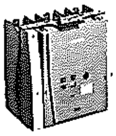
24 kV 50/60 Hz Article No.	Rated normal current I_r A	Width across flats mm	Pole-center distance mm	Rated switching sequence: O – 0.3 s – CO – 15 s – CO	Rated short-circuit duration t_k s	Rated short-circuit breaking current I_{sc} kA	DC component in % of the rated short-circuit breaking current %	Asymmetric breaking current kA	Rated short-circuit making current (at 50/60 Hz) I_{ma} kA	Rated back-to-back-capacitor-bank inrush making current I_{bi} kA, peak	Rated lightning impulse voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Voltage drop ΔU between connections (acc. to IEC 62271-1 at 100 A DC) mV	Minimum creepage distance Interrupters mm	Minimum creepage distance Phase-to-earth mm	Minimum clearance Phase-to-phase mm	Minimum clearance Phase-to-earth mm	Mass 1) (fixed-mounted circuit breaker/withdrawable module) kg	Detailed dimension drawing (must be explicitly requested)	Operating cycle diagram no. (see page 78)
3AE1 321-1...	800	310	210	■	3	12.5	36	14.9	31/33	10	125	50	2.6	200	350	200	210	120/160	A7E44202050	16
3AE1 321-2...	1250	310	210	■	3	12.5	36	14.9	31/33	10	125	50	2.6	200	350	200	210	120/160	A7E44202050	16
3AE1 322-1...	800	310	210	■	3	16	36	17.9	40/42	10	125	50	2.6	200	350	200	210	120/160	A7E44202050	17
3AE1 322-2...	1250	310	210	■	3	16	36	17.9	40/42	10	125	50	2.6	200	350	200	210	120/160	A7E44202050	17
3AE1 322-4...	2000	310	210	■	3	16	36	17.9	40/42	10	125	50	2.0	200	340	200	205	140/180	A7E44202051	17
3AE1 323-1...	800	310	210	■	3	20	36	22.4	50/52	10	125	50	2.6	200	350	200	210	120/160	A7E44202050	18
3AE1 323-2...	1250	310	210	■	3	20	36	22.4	50/52	10	125	50	2.6	200	350	200	210	120/160	A7E44202050	18
3AE1 323-4...	2000	310	210	■	3	20	36	22.4	50/52	10	125	50	2.0	200	340	200	205	140/180	A7E44202051	18
3AE1 323-6...	2500	310	210	■	3	20	36	22.4	50/52	10	125	50	2.0	200	340	200	205	140/180	A7E44202051	18
3AE1 324-1...	800	310	210	■	3	25	36	28	63/65	10	125	50	2.6	200	350	200	210	120/160	A7E44202050	19
3AE1 324-2...	1250	310	210	■	3	25	36	28	63/65	10	125	50	2.6	200	350	200	210	120/160	A7E44202050	19
3AE1 324-4...	2000	310	210	■	3	25	36	28	63/65	10	125	50	2.0	200	340	200	205	140/180	A7E44202051	19
3AE1 324-6...	2500	310	210	■	3	25	36	28	63/65	10	125	50	2.0	200	340	200	205	140/180	A7E44202051	19
3AE1 352-1...	800	310	275	■	3	16	36	17.9	40/42	10	125	50	2.6	200	350	265	210	130/180	A7E44202052	17
3AE1 352-2...	1250	310	275	■	3	16	36	17.9	40/42	10	125	50	2.6	200	350	265	210	130/180	A7E44202052	17
3AE1 352-4...	2000	310	275	■	3	16	36	17.9	40/42	10	125	50	2.0	200	340	265	205	150/200	A7E44202053	17
3AE1 353-1...	800	310	275	■	3	20	36	22.4	50/52	10	125	50	2.6	200	350	265	210	130/180	A7E44202052	18
3AE1 353-2...	1250	310	275	■	3	20	36	22.4	50/52	10	125	50	2.6	200	350	265	210	130/180	A7E44202052	18
3AE1 353-4...	2000	310	275	■	3	20	36	22.4	50/52	10	125	50	2.0	200	340	265	205	150/200	A7E44202053	18
3AE1 353-6...	2500	310	275	■	3	20	36	22.4	50/52	10	125	50	2.0	200	340	265	205	150/200	A7E44202053	18

■ Standard information on rating plate

1) The mass of the fixed-mounted circuit breaker, fitted on the withdrawable part, increases by the values specified in the dimension drawing of the withdrawable part (page 83)

Technical data

Electrical data, dimensions and masses for 3AE1

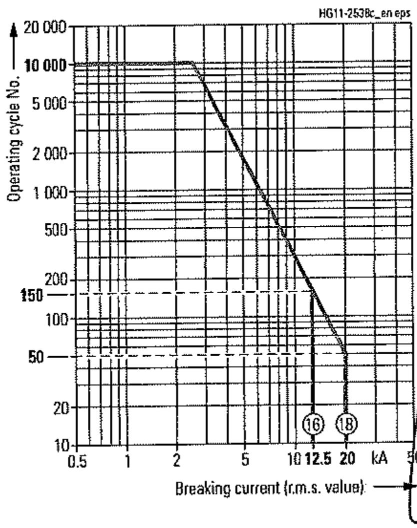


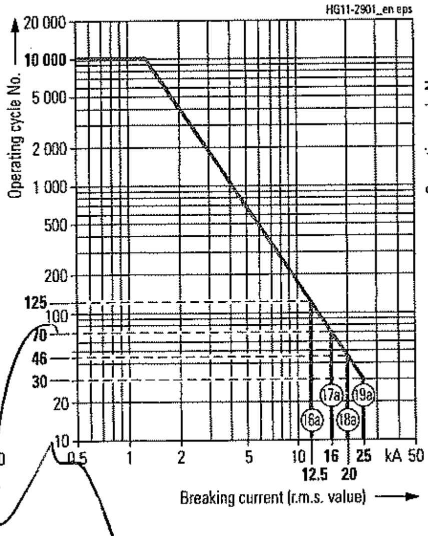
24 kV 50/60 Hz Article No.	Rated normal current I_r A	Width across flats mm	Pole-center distance mm	Rated switching sequence: O – 0.3 s – CO – 15 s – CO	Rated short-circuit duration t_k s	Rated short-circuit breaking current I_{sc} kA	DC component in % of the rated short-circuit breaking current %	Asymmetric breaking current kA	Rated short-circuit making current (at 50/60 Hz) I_{ma} kA	Rated back-to-back-capacitor-bank inrush making current I_{bi} kA, peak	Rated lightning impulse voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Voltage drop ΔU between connections (acc. to IEC 62271-1 at 100 A DC) mV	Minimum creepage distance Interrupters mm	Minimum creepage distance Phase-to-earth mm	Minimum clearance Phase-to-phase mm	Minimum clearance Phase-to-earth mm	Mass 1) (fixed-mounted circuit breaker/withdrawable module) kg	Detailed dimension drawing (must be explicitly requested)	Operating cycle diagram No. (see below)
3AE1 354-1...	800	310	275	■	3	25	36	28	63/65	10	125	50	2.6	200	350	265	210	130/180	A7E44202052	19
3AE1 354-2...	1250	310	275	■	3	25	36	28	63/65	10	125	50	2.6	200	350	265	210	130/180	A7E44202052	19
3AE1 354-4...	2000	310	275	■	3	25	36	28	63/65	10	125	50	2.0	200	340	265	205	150/200	A7E44202053	19
3AE1 354-6...	2500	310	275	■	3	25	36	28	63/65	10	125	50	2.0	200	340	265	205	150/200	A7E44202053	19
3AE1 714-2...	1250	320	210	■	3	25	36	28	63/65	10	125	50	2.6	200	350	200	210	120/–	–	19
3AE1 744-4...	2000	320	275	■	3	25	36	28	63/65	10	125	50	2.0	200	340	200	205	150/–	–	19
3AE1 744-6...	2500	320	275	■	3	25	36	44.9	63/65	10	125	50	2.0	200	340	200	205	150/–	–	19

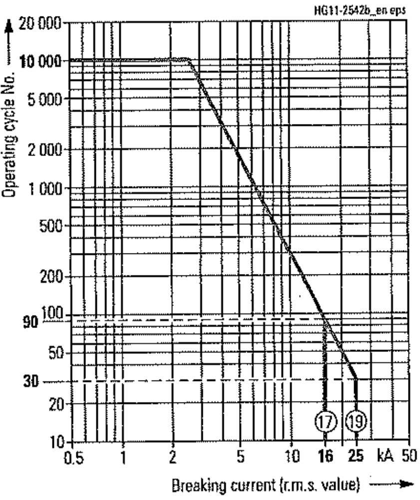
■ Standard information on rating plate

1) The mass of the fixed-mounted circuit breaker, fitted on the withdrawable part, increases by the values specified in the dimension drawing of the withdrawable part (page 83)

Operating cycle diagrams for 24 kV

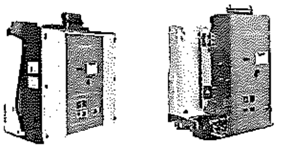






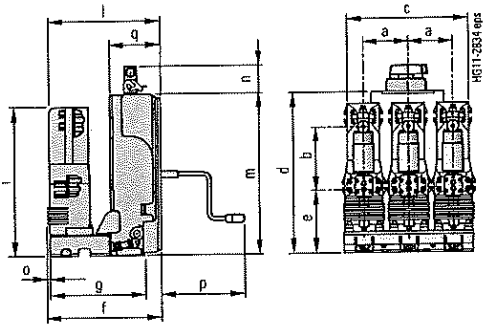
The permissible number of electrical operating cycles is shown as a function of the breaking current (r.m.s. value). All SION vacuum circuit-breakers fulfill the endurance classes E2, M2 and C2 according to IEC 62271-100.

The curve shape beyond the parameters defined in IEC 62271-100 is based on average usage data. The number of operating cycles that can actually be reached can be different depending on the respective application.



Dimension drawings for 7.2 to 24 kV

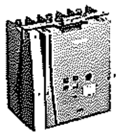
Vacuum circuit breaker without contact arm



Voltage level	Pole-center distance a mm	Width across flats b mm	c mm	d mm	e mm	f mm	g mm	i mm	l mm	m mm	n mm	o mm	p mm	q mm
7.2 kV	150	205	445	540	217.5	380	329	500.5 1)2)	371	540	105	8	305	169
	150	275	445	540	217.5	380	329	500.5 1)2)	371	540	105	8	305	169
	150	310	445	540	237.5	380	329	500.5 1)2)	371	540	105	8	305	169
	160	205	465	540	217.5	380	329	500.5 1)2)	371	540	105	8	305	169
	160	275	465	540	217.5	380	329	500.5 1)2)	371	540	105	8	305	169
	160	310	465	540	237.5	380	329	500.5 1)2)	371	540	105	8	305	169
	210	205	565	540	217.5	380	329	500.5 1)	371	540	105	8	305	169
	210	275	565	540	217.5	380	329	500.5 1)	371	540	105	8	305	169
	210	310	565	540	237.5	380	329	500.5 1)	371	540	105	8 3)	305	169
12 kV	150	205	445	540	217.5	380	329	500.5 1)2)	371	540	105	8	305	169
	150	275	445	540	217.5	380	329	500.5 1)2)	371	540	105	8	305	169
	150	310	445	540	237.5	380	329	500.5 1)2)	371	540	105	8	305	169
	160	205	465	540	217.5	380	329	500.5 1)2)	371	540	105	8	305	169
	160	275	465	540	217.5	380	329	500.5 1)2)	371	540	105	8	305	169
	160	310	465	540	237.5	380	329	500.5 1)2)	371	540	105	8	305	169
	210	205	565	540	217.5	380	329	500.5 1)	371	540	105	8	305	169
	210	275	565	540	217.5	380	329	500.5 1)	371	540	105	8	305	169
	210	310	565	540	237.5	380	329	500.5 1)	371	540	105	8	305	169
	275	310	565	540	237.5	380	329	500.5 1)	371	540	105	30	305	169
17.5 kV	150	205	445	540	217.5	380	329	540	371	540	105	8	305	169
	150	275	445	540	217.5	380	329	540	371	540	105	8	305	169
	150	310	445	540	237.5	380	329	540	371	540	105	8	305	169
	160	205	465	540	217.5	380	329	540	371	540	105	8	305	169
	160	275	465	540	217.5	380	329	540	371	540	105	8	305	169
	160	310	465	540	237.5	380	329	540	371	540	105	8	305	169
	210	205	565	540	217.5	380	329	540	371	540	105	8	305	169
	210	275	565	540	217.5	380	329	540	371	540	105	8	305	169
	210	310	565	540	237.5	380	329	540	371	540	105	8	305	169
	275	310	565	540	237.5	380	329	540	371	540	105	30	305	169
24 kV	210	310	570	540	283	459	399	667	421	540	105	7	305	169
	275	310	695	540	283	459	399	667	421	540	105	7	305	169

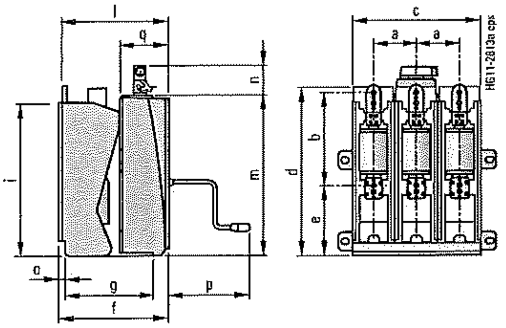
<u>Note:</u> Small deviations of the dimensions are permissible

1) At I_{sc} = 31.5 kA or at I_r = 1600 A --> 540 mm
2) At I_{sc} = 31.5 kA --> 552 mm
3) At I_r >1600 A --> 30 mm



Dimension drawings for 7.2 to 24 kV

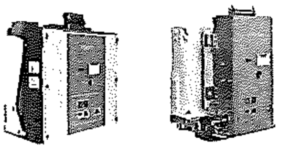
Vacuum circuit breaker without contact arm



Voltage level	Pole-center distance a mm	Width across flats b mm	c mm	d mm	e mm	f mm	g mm	i mm	l mm	m mm	n mm	o mm	p mm	q mm
7.2 kV	210	310	565	540 5)	237.5	380 1)	300 2) 6)	523 3) 7)	371 4)	540	105	30 8)	279	165
12 kV	210	275	565	540 5)	217.5	380	300 6)	523 7)	371	540	105	30	279	165
	210	310	565	540 5)	237.5	380 1)	300 2) 6)	523 3) 7)	371 4)	540	105	30 8)	279	165
17.5 kV	210	275	565	562	217.5	380	310	517.5	371	540	105	30	279	165
	210	310	565	562	237.5	380 1)	310 2)	517.5 3)	371 4)	540	105	30 8)	279	165
24 kV	210	310	570	739	283	469	360	739	421	540	105	58	279	165
	275	310	700	739	283	469	360	739	421	540	105	58	279	165

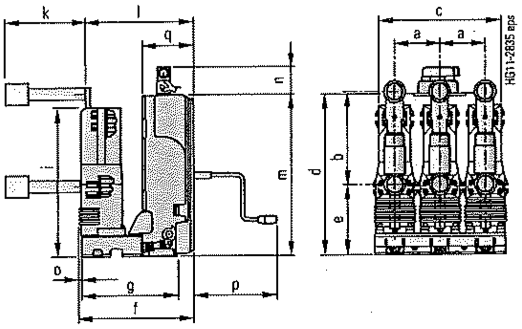
Note: Small deviations of the dimensions are permissible

1) At I_{sc} = 40 kA --> 450 mm
2) At I_{sc} = 40 kA --> 350 mm
3) At I_{sc} = 40 kA --> 610 mm
4) At I_{sc} = 40 kA --> 420 mm
5) At I_n >1250 A or at I_{sc} = 31.5 kA --> 562 mm
6) At I_n >1250 A or at I_{sc} = 31.5 kA --> 310 mm
7) At I_n >1250 A or at I_{sc} = 31.5 kA --> 518 mm
8) At I_{sc} = 40 kA --> 50 mm



Dimension drawings for 7.2 to 24 kV

Vacuum circuit breaker with contact arm



Voltage level	Pole-center distance a mm	Width across flats b mm	c mm	d mm	e mm	f mm	g mm	i mm	k mm	l mm	m mm	n mm	o mm	p mm	q mm
7.2 kV	150	205	445	540	217.5	380	329	500.5 1)2)	274	371	540	105	8	305	169
	150	275	445	540	217.5	380	329	500.5 1)2)	274	371	540	105	8	305	169
	150	310	445	540	237.5	380	329	500.5 1)2)	274	371	540	105	8	305	169
	160	205	465	540	217.5	380	329	500.5 1)2)	274	371	540	105	8	305	169
	160	275	465	540	217.5	380	329	500.5 1)2)	274	371	540	105	8	305	169
	160	310	465	540	237.5	380	329	500.5 1)2)	274	371	540	105	8	305	169
	210	205	565	540	217.5	380	329	500.5 1)	274	371	540	105	8	305	169
	210	275	565	540	217.5	380	329	500.5 1)	274	371	540	105	8	305	169
	210	310	565	540	237.5	380	329	500.5 1)	274	371	540	105	8 3)	305	169
12 kV	150	205	445	540	217.5	380	329	500.5 1)2)	274	371	540	105	8	305	169
	150	275	445	540	217.5	380	329	500.5 1)2)	274	371	540	105	8	305	169
	150	310	445	540	237.5	380	329	500.5 1)2)	274	371	540	105	8	305	169
	160	205	465	540	217.5	380	329	500.5 1)2)	274	371	540	105	8	305	169
	160	275	465	540	217.5	380	329	500.5 1)2)	274	371	540	105	8	305	169
	160	310	465	540	237.5	380	329	500.5 1)2)	274	371	540	105	8	305	169
	210	205	565	540	217.5	380	329	500.5 1)	274	371	540	105	8	305	169
	210	275	565	540	217.5	380	329	500.5 1)	274	371	540	105	8	305	169
	210	310	565	540	237.5	380	329	500.5 1)	274	371	540	105	8	305	169
	275	310	695	540	237.5	380	329	500.5 1)	274	371	540	105	30	305	169
17.5 kV	150	205	445	540	217.5	380	329	540	274	371	540	105	8	305	169
	150	275	445	540	217.5	380	329	540	274	371	540	105	8	305	169
	150	310	445	540	237.5	380	329	540	274	371	540	105	8	305	169
	160	205	465	540	217.5	380	329	540	274	371	540	105	8	305	169
	160	275	465	540	217.5	380	329	540	274	371	540	105	8	305	169
	160	310	465	540	237.5	380	329	540	274	371	540	105	8	305	169
	210	205	565	540	217.5	380	329	540	274	371	540	105	8	305	169
	210	275	565	540	217.5	380	329	540	274	371	540	105	8	305	169
	210	310	565	540	237.5	380	329	540	274	371	540	105	8	305	169
	275	310	695	540	237.5	380	329	540	274	371	540	105	30	305	169
24 kV	210	310	570	540	283	459	399	667	325	421	540	105	7	305	169
	275	310	695	540	283	459	399	667	325	421	540	105	7	305	169

<u>Note:</u> Small deviations of the dimensions are permissible

1) At I_{sc} = 31.5 kA or at I_r = 1600 A –> 540 mm
2) At I_{sc} = 31.5 kA –> 552 mm
3) At I_r >1600 A –> 30 mm

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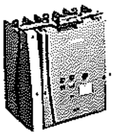
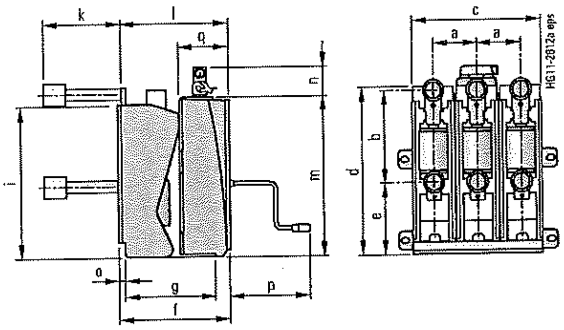
Technical data

Dimension drawings for voltage levels 7.2 kV to 24 kV for 3AE1



Dimension drawings for 7.2 to 24 kV

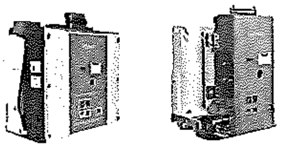
Vacuum circuit breaker with contact arm



Voltage level	Pole-center distance a mm	Width across flats b mm	c mm	d mm	e mm	f mm	g mm	i mm	k mm	l mm	m mm	n mm	o mm	p mm	q mm
7.2 kV	210	310	565	540 5)	237.5	380 1)	300 2) 6)	523 3) 7)	274	371 4)	540	105	30 8)	279	165
12 kV	210	275	565	540 5)	217.5	380	300 6)	523 7)	274	371	540	105	30	279	165
	210	310	565	540 5)	237.5	380 1)	300 2) 6)	523 3) 7)	274	371 4)	540	105	30 8)	279	165
17.5 kV	210	275	565	562	217.5	380	310	517.5	274	371	540	105	30	279	165
	210	310	565	562	237.5	380 1)	310 2)	517.5 3)	274	371 4)	540	105	30 8)	279	165
24 kV	210	310	570	739	283	469	360	739	324	421	540	105	58	279	165
	275	310	700	739	283	469	360	739	324	421	540	105	58	279	165

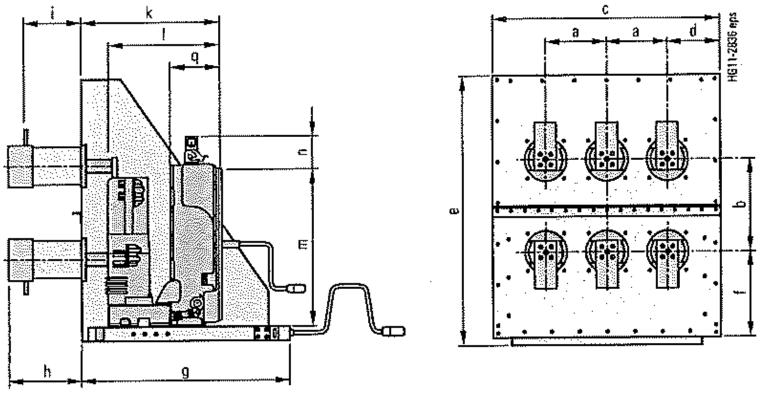
<u>Note:</u> Small deviations of the dimensions are permissible

1) At I_{sc} = 40 kA --> 450 mm
2) At I_{sc} = 40 kA --> 350 mm
3) At I_{sc} = 40 kA --> 610 mm
4) At I_{sc} = 40 kA --> 420 mm
5) At I_n >1250 A or at I_{sc} = 31.5 kA --> 562 mm
6) At I_n >1250 A or at I_{sc} = 31.5 kA --> 310 mm
7) At I_n >1250 A or at I_{sc} = 31.5 kA --> 518 mm
8) At I_{sc} = 40 kA --> 50 mm



Dimension drawings for 7.2 to 24 kV

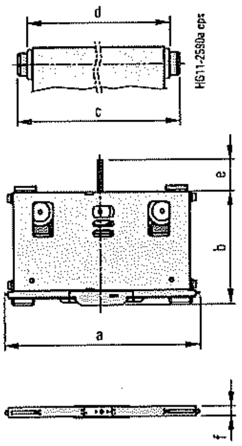
Cartridge without earthing switch



Voltage level	Pole-center distance a mm	Width across flats b mm	c mm	d mm	e mm	f mm	g mm	h mm	i mm	k mm	l mm	m mm	n mm	q mm
7.2 kV	150	275	594	147	850	266.5	710	263	224	476	371	540	105	169
	150	310	594	147	905	286.5	710	263	224	476	371	540	105	169
	210	275	794	187	850	266.5	710	263	224	476	371	540	105	169
	210	310	794	187	905	286.5	710	263	224	476	371	540	105	169
12 kV	150	275	594	147	850	266.5	710	263	224	476	371	540	105	169
	150	310	594	147	905	286.5	710	263	224	476	371	540	105	169
	210	275	794	187	850	266.5	710	263	224	476	371	540	105	169
	210	310	794	187	905	286.5	710	263	224	476	371	540	105	169
	275	310	994	222	905	286.5	710	263	224	476	371	540	105	169
17.5 kV	150	205	594	147	850	266.5	710	263	224	476	371	540	105	169
	150	275	594	147	905	286.5	710	263	224	476	371	540	105	169
	210	205	794	187	850	266.5	710	263	224	476	371	540	105	169
	210	275	794	187	905	286.5	710	263	224	476	371	540	105	169
	275	310	994	222	905	286.5	710	263	224	476	371	540	105	169
24 kV	210	310	794	187	1040.5	332	810	323	274	537	421	540	105	169
	275	310	994	222	1040.5	332	810	323	274	537	421	540	105	169

Note: Small deviations of the dimensions are permissible

Withdrawable part



Voltage level	Pole-center distance mm	a mm	b mm	c mm	d mm	e mm	f mm	Mass
7.2 kV	150	529	424	500	470	107	42	approx. 15 kg
	160	529	424	500	470	107	42	approx. 15 kg
	210	679	424	650	620	107	42	approx. 20 kg
12 kV	150	529	424	500	470	107	42	approx. 15 kg
	160	529	424	500	470	107	42	approx. 15 kg
	210	679	424	650	620	107	42	approx. 20 kg
17.5 kV	150	529	424	500	470	107	42	approx. 15 kg
	160	529	424	500	470	107	42	approx. 15 kg
	210	679	424	650	620	107	42	approx. 20 kg
24 kV	210	679	424	650	620	107	42	approx. 20 kg
	275	879	424	850	820	107	42	approx. 25 kg

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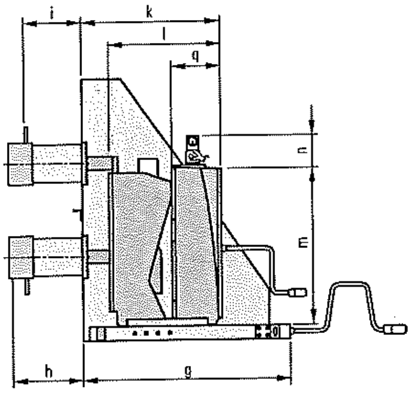
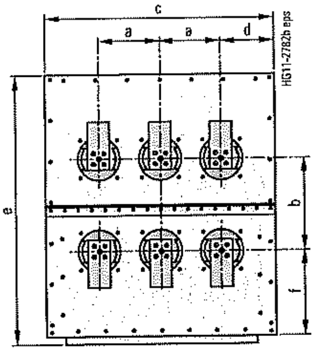
Technical data

Dimension drawings for voltage levels 7.2 kV to 24 kV for 3AE1

Dimension drawings for 7.2 to 24 kV

Cartridge without earthing switch





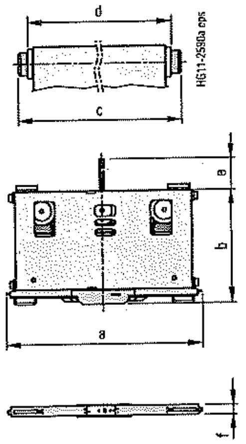
Voltage level	Pole-center distance a mm	Width across flats b mm	c mm	d mm	e mm	f mm	g mm	h mm	h' mm	i mm	i' mm	k mm	l mm	m mm	n mm	q mm
7.2 kV	210	310	794	187	905	286.5	710 1)	263	323	224	274	476 2)	371 3)	540	105	165
12 kV	210	275	794	187	850	286.5	710	263	–	224	–	476	371	540	105	165
	210	310	794	187	905	286.5	710 1)	263	323	224	274	476 2)	371 3)	540	105	165
17.5 kV	210	275	794	187	850	286.5	710	263	–	224	–	476	371	540	105	165
	210	310	794	187	905	286.5	710 1)	263	323	224	274	476 2)	371 3)	540	105	165
24 kV	210	310	794	187	1040.5	332	810	323	323	274	323	537	421	540	105	165
	275	310	994	222	1040.5	332	810	323	323	274	323	537	421	540	105	165

h/i = up to I_r = 1250 A
h'/i' = at I_r = 2000 A, 2500 A and 3150 A

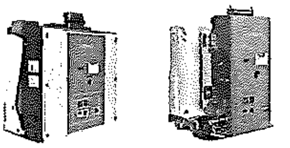
Note: Small deviations of the dimensions are permissible

1) At I_{sc} = 40 kA –> 760 mm
2) At I_{sc} = 40 kA –> 526 mm
3) At I_{sc} = 40 kA –> 420 mm

Withdrawable part

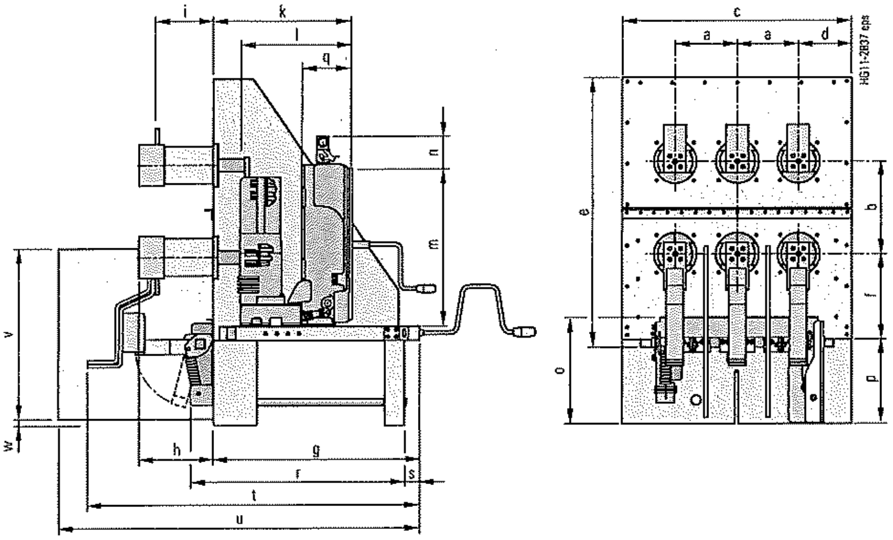


Voltage level	Pole-center distance mm	a mm	b mm	c mm	d mm	e mm	f mm	Mass
7.2 kV	210	679	424	650	620	107	42	approx. 20 kg
12 kV	210	679	424	650	620	107	42	approx. 20 kg
17.5 kV	210	679	424	650	620	107	42	approx. 20 kg
24 kV	210	679	424	650	620	107	42	approx. 20 kg
	275	879	424	850	820	107	42	approx. 25 kg



Dimension drawings for 7.2 to 24 kV

Cartridge with earthing switch



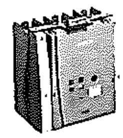
Voltage level	Pole-center distance a mm	Width across flats b mm	c mm	d mm	e mm	f mm	g mm	h mm	i mm	k mm	l mm	m mm	n mm
7.2 kV	150	275	594	147	850	266.5	710	263	224	476	371	540	105
	150	310	594	147	905	286.5	710	263	224	476	371	540	105
	210	275	794	187	850	266.5	710	263	224	476	371	540	105
	210	310	794	187	905	286.5	710	263	224	476	371	540	105
12 kV	150	275	594	147	850	266.5	710	263	224	476	371	540	105
	150	310	594	147	905	286.5	710	263	224	476	371	540	105
	210	275	794	187	850	266.5	710	263	224	476	371	540	105
	210	310	794	187	905	286.5	710	263	224	476	371	540	105
	275	310	994	222	905	286.5	710	263	224	476	371	540	105
17.5 kV	150	275	594	147	850	266.5	710	263	224	476	371	540	105
	150	310	594	147	905	286.5	710	263	224	476	371	540	105
	210	275	794	187	850	266.5	710	263	224	476	371	540	105
	210	310	794	187	905	286.5	710	263	224	476	371	540	105
	275	310	994	222	905	286.5	710	263	224	476	371	540	105
24 kV	210	310	794	187	1040.5	332	810	323	274	537	421	540	105
	275	310	994	222	1040.5	332	810	323	274	537	421	540	105

Voltage level	o mm	p mm	q mm	r mm	s mm	t mm	u mm	v mm	w mm
7.2 kV	359	287	169	803	64	1142	1233	575	25
	363	287	169	803	64	1142	1233	575	25
	359	287	169	803	65	1143	1234	-	-
	359	287	169	803	65	1142	1234	-	-
12 kV	359	287	169	803	64	1142	1233	575	25
	363	287	169	803	64	1142	1233	575	25
	359	287	169	803	65	1143	1234	-	-
	359	287	169	803	65	1143	1234	-	-
	-	-	-	803	-	-	-	-	-
17.5 kV	359	287	169	803	64	1142	1233	575	25
	363	287	169	803	64	1142	1233	575	25
	359	287	169	803	65	1143	1234	-	-
	359	287	169	803	65	1143	1234	-	-
	-	-	-	803	-	-	-	-	-
24 kV	359	287	169	902	64	1243	1433	575	10
	359	287	169	902	65	1243	1433	-	-

Note: Small deviations of the dimensions are permissible

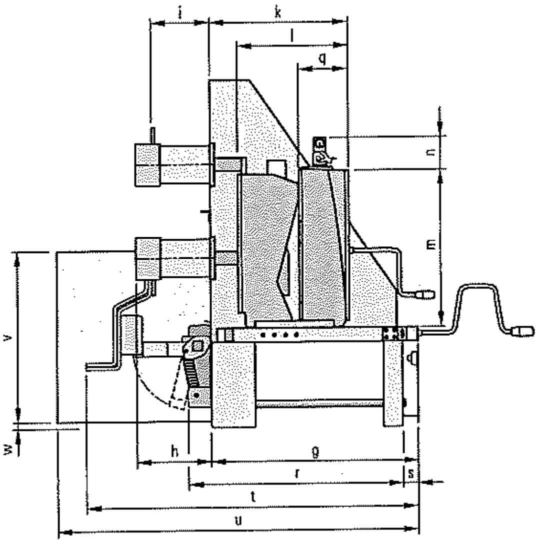
Technical data

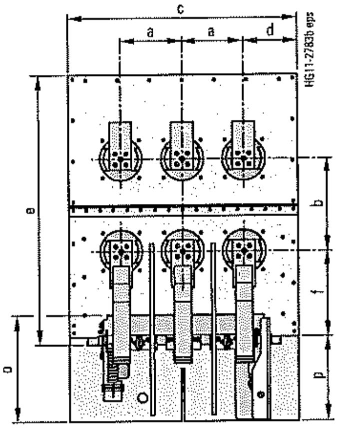
Dimension drawings for voltage levels 7.2 kV to 24 kV for 3AE1



Dimension drawings for 7.2 to 24 kV

Cartridge with earthing switch





Voltage level	Pole-center distance a mm	Width across flats b mm	c mm	d mm	e mm	f mm	g mm	h mm	h' mm	i mm	i' mm	k mm	l mm	m mm	n mm
7.2 kV	210	310	794	187	905	286.5	710 1)	263	323	224	274	476 2)	371 3)	540	105
12 kV	210	275	794	187	850	266.5	710	263	–	224	–	476	371	540	105
	210	310	794	187	905	286.5	710 1)	263	323	224	274	476 2)	371 3)	540	105
17.5 kV	210	275	794	187	850	266.5	710	263	–	224	–	476	371	540	105
	210	310	794	187	905	286.5	710 1)	263	323	224	274	476 2)	371 3)	540	105
24 kV	210	310	794	187	1040.5	332	810	323	323	274	323	537	421	540	105
	275	310	994	222	1040.5	332	810	323	323	274	323	537	421	540	105

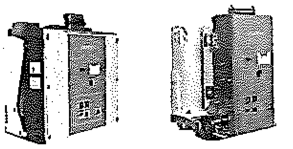
Voltage level	o mm	p mm	q mm	r mm	s mm	t mm	u mm	v mm	w mm
7.2 kV	359	287	165	803	65	1142	1234	–	–
12 kV	359	287	165	803	65	1143	1234	–	–
	359	287	165	803	65	1143	1234	–	–
17.5 kV	359	287	165	803	65	1143	1234	–	–
	359	287	165	803	65	1143	1234	–	–
24 kV	359	287	165	902	64	1243	1433	575	10
	359	287	165	902	65	1243	1433	–	–

h/i = up to I_r = 1250 A
h'/i' = at I_r = 2000 A, 2500 A and 3150 A

<u>Note:</u> Small deviations of the dimensions are permissible

1) At I_{sc} = 40 kA --> 760 mm
2) At I_{sc} = 40 kA --> 526 mm
3) At I_{sc} = 40 kA --> 420 mm

Operating times and internal times, short-circuit protection of motors, consumption data of the releases



Operating times and internal times for 3AE5

Operating times at rated voltage of the secondary circuit	Equipment of circuit breaker	Circuit breaker operating time
Closing time	–	≤ 60 ms
Opening time	1st shunt release	≤ 30 ms
	2nd and 3rd release	≤ 45 ms
Arcing time	–	< 15 ms
Break time	1st shunt release	≤ 45 ms
	2nd and 3rd release	≤ 60 ms
CLOSE / OPEN contact time	1st shunt release	≤ 60 ms
	2nd and 3rd release	≤ 75 ms
Minimum command duration	Closing solenoid	45 ms
	1st shunt release	40 ms
	2nd and 3rd release	20 ms
Pulse time for circuit breaker tripping signal	1st shunt release	> 10 ms
	2nd and 3rd release	> 6 ms
Charging time for electrical operation		< 15 s
Synchronism error between the poles		≤ 2 ms

Motor short-circuit protection (fuse protection of drive motors) for 3AE5

Rated voltage of the motor	Operating voltage		Power consumption of the motor	Smallest possible rated current [1] of the miniature circuit breaker with C-characteristic
V	max. V	min. V	W/VA	A
24 DC	26	20	140	6
48 DC	53	41	140	3
60 DC	66	51	150	3
110 DC	121	93	280	3
220 DC	242	187	260	1.2
110 AC	121	93	280	3
230 AC	244	187	260	1.2

1) The inrush current in the drive motor can be neglected due to its very short presence.

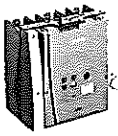
Consumption data of releases for 3AE5

Release	Power consumption		Tripping ranges	
	Operation at		Tripping voltage	Tripping voltage or tripping current
	DC approx. W	AC 50/60 Hz approx. VA	at DC	at AC 50/60 Hz
Closing solenoid 3AY14 10	300 – 370	300 – 370	85 to 110 % U	85 to 110 % U
1st shunt release (without stored-energy mechanism) 3AY14 10	300	300	70 to 110 % U	85 to 110 % U
2nd and 3rd shunt release (with stored-energy mechanism) 3AX11 01	70	50	70 to 110 % U	85 to 110 % U
Undervoltage release 3AX11 03	20	20	35 to 0 % U	35 to 0 % U
Current-transformer-operated release 3AX (rated normal current 0.5 A, 1 A or 5 A)	–	10 [2]	–	90 to 110 % I_a
Current-transformer-operated release 3AX11 04 (tripping pulse ≥ 0.1 Ws)	–	–	–	–

2) Consumption at pickup current (90 % of the rated normal current) and open armature.

Technical data

Operating times and internal times, short-circuit protection of motors, consumption data of the releases



Operating times and internal times for 3AE1

Operating times at rated voltage of the secondary circuit	Equipment of circuit breaker	Circuit breaker operating time
Closing time	–	< 60 ms
Opening time	1st shunt release	< 60 ms
	2nd release	< 45 ms
Arcing time	–	< 15 ms
Break time	1st shunt release	< 75 ms
	2nd release	< 60 ms
CLOSE/OPEN contact time	1st shunt release	< 75 ms
	2nd release	< 60 ms
Minimum command duration	Closing solenoid	45 ms
	1st shunt release	40 ms
	2nd release	20 ms
Pulse time for circuit breaker tripping signal	1st shunt release	> 15 ms
	2nd release	> 10 ms
Charging time for electrical operation		< 15 s
Synchronism error between the poles		≤ 2 ms

Motor short-circuit protection (fuse protection of drive motors) for 3AE1

Rated voltage of the motor	Operating voltage		Power consumption of the motor	Smallest possible rated current [1] of the miniature circuit breaker with C-characteristic
V	max. V	min. V	W/VA	A
24 DC [2]	26	20	520 – 590	8
48 DC	53	41	470 – 600	6
60 DC	66	51	520 – 610	4
110 DC	121	93	650 – 740	4
220 DC	242	187	610 – 900	1.6
110 AC	121	93	670 – 740 VA	2
230 AC	244	187	620 – 960 VA	1.6

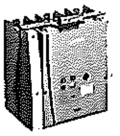
1) The inrush current in the drive motor can be neglected due to its very short presence.

2) Does not apply to a rated short-circuit breaking current of 40 kA

Consumption data of releases for 3AE1

Release	Power consumption		Tripping ranges	
	Operation at		Tripping voltage	Tripping voltage or tripping current
	DC approx. W	AC 50/60 Hz approx. VA	at DC	at AC 50/60 Hz
Closing solenoid 3AY15 10	140 – 210	140 – 210	85 to 110 % U	85 to 110 % U
1st shunt release (without stored-energy mechanism) 3AY15 10	140	140	70 to 110 % U	85 to 110 % U
2nd shunt release (with stored-energy mechanism) 3AX11 01	70	50	70 to 110 % U	85 to 110 % U
Undervoltage release 3AX11 03	20	20	35 to 0 % U	35 to 0 % U
Current-transformer-operated release 3AX (rated normal current 0.5 A, 1 A or 5 A)	–	10 [2]	–	90 to 110 % I_a
Current-transformer-operated release 3AX11 04 (tripping pulse ≥ 0.1 Ws)	–	–	–	–

2) Consumption at pickup current (90 % of the rated normal current) and open armature.

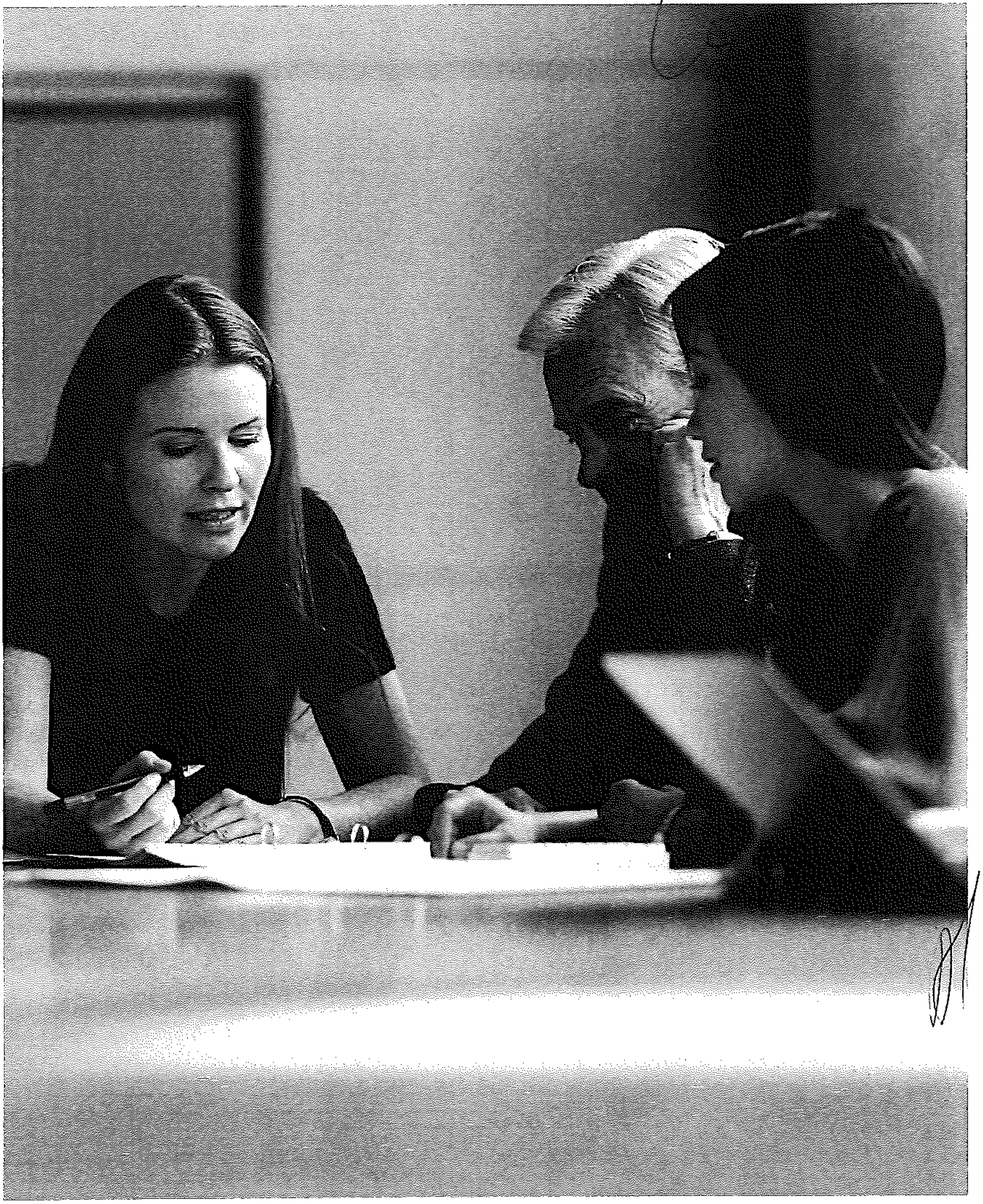


Circuit diagrams for 3AE5 and 3AE1 can be found at the Siemens Industry Online Support (SIOS):

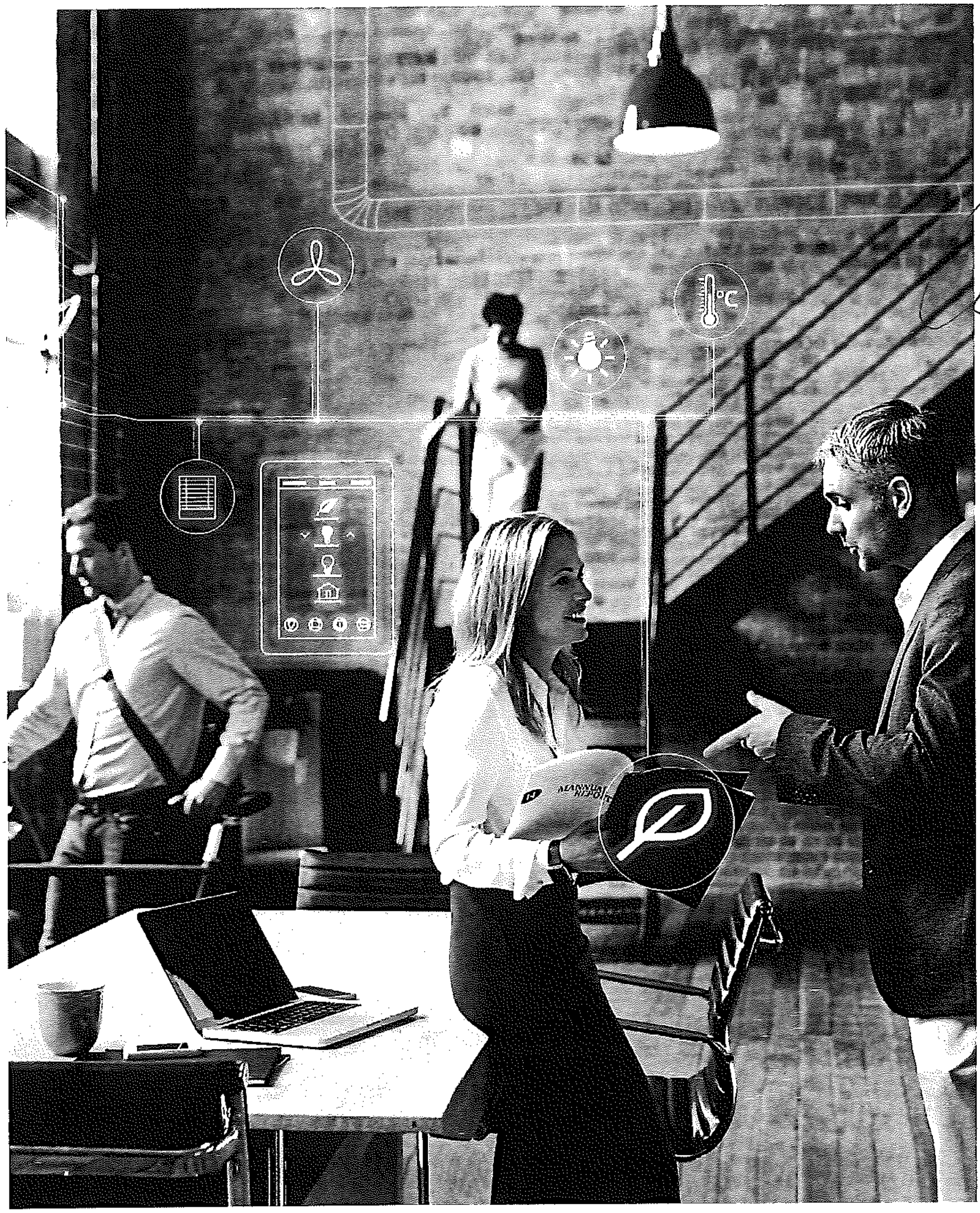
http://support.industry.siemens.com/

Circuit manual 3AE5 (64-pole): SA7E449 99009 021
Circuit manual 3AE5 (24-pole): SA7E449 99009 022
Circuit manual 3AE5 (20-pole): SA7E449 99009 013

Circuit manual 3AE1 (64-pole): SA7E449 99007 001
Circuit manual 3AE1 (24-pole): SA7E449 99007 002
Circuit manual 3AE1 (27-pole): SA7E449 99007 003



584



CBK

R-HG11-181.tif

R-HG11-180.eps

Switchgear Factory in Berlin, Germany

Contents Page

Annex 79

587

Appendix
Inquiry form

Please copy, fill in and
return to your Siemens partner.

Inquiry concerning

SION vacuum circuit breaker from 7.2 kV to 24 kV

Please

☐ Submit an offer
☐ Call us
☐ Visit us

Your address

Company
Department
Name
Street
Postal code/ city
Country
Phone
Fax
Email

Siemens AG

Department
Name
Street
Postal code/ city
Country
Fax

Technical data

				Other values
Rated voltage	☐ 7.2 kV ☐ 24 kV	☐ 12 kV	☐ 17.5 kV	☐ ___ kV
Rated lightning impulse withstand voltage	☐ 60 kV ☐ 125 kV	☐ 75 kV	☐ 95 kV	☐ ___ kV
Rated short-duration power-frequency withstand voltage	☐ 20 kV ☐ 42 kV	☐ 28 kV ☐ 50 kV	☐ 38 kV ☐ 55 kV	☐ ___ kV
Rated short-circuit breaking current	☐ 12.5 kA ☐ 25 kA	☐ 16 kA ☐ 31.5 kA	☐ 20 kA ☐ 40 kA	☐ ___ kA
Rated normal current	☐ 800 A ☐ 2500 A	☐ 1250 A ☐ 3150 A	☐ 2000 A	☐ ___ A
Pole-center distance	☐ 150 mm	☐ 160 mm	☐ 210 mm	☐ 275 mm
Width across flats	☐ 205 mm	☐ 275 mm	☐ 310 mm	

Secondary equipment
For possible combinations, see pages 35 to 40

Circuit breaker installation equipment	☐ Fixed mounting	☐ Withdrawable part, contact arms ☐ Withdrawable part, contact arms, bushings ☐ Withdrawable module with earthing switch ☐ Withdrawable module without earthing switch ☐ Retrofit	
Drive motor	☐ DC ___ V	☐ AC ___ V, ___ Hz	
Closing solenoid	☐ DC ___ V	☐ AC ___ V, ___ Hz	
1st shunt release	☐ DC ___ V	☐ AC ___ V, ___ Hz	
2nd shunt release	☐ DC ___ V	☐ AC ___ V, ___ Hz	
C.t.-operated release	☐		
Undervoltage release	☐ DC ___ V	☐ AC ___ V, ___ Hz	
Auxiliary switch	☐ 6 NO + 6 NC	☐ 12 NO + 12 NC	
Low-voltage connection	☐ 20-pole plug connector or 27-pole terminal strip	☐ 24-pole plug	☐ 64-pole plug
☐ Mechanical interlocking			
☐ Circuit breaker tripping signal			
☐ Electrical closing lock-out			
Operating instructions	☐ German	☐ English	☐ French ☐ Spanish

Application and other requirements

☐ Please check off ___ Please fill in

CRR

You prefer to configure your SION vacuum circuit breaker on your own?

Please follow the steps for configuration and enter the article number in the configuration aid.

Instruction for configuration of the SION vacuum circuit breaker

1st step: Definition of the circuit breaker and equipment package (see pages 18 to 34)

Please specify the following ratings:	Possible options:
Rated voltage (U_r)	U_r: 7.2 kV to 24 kV
Rated lightning impulse voltage (U_p)	U_p: 60 kV to 125 kV
Rated short-duration power-frequency withstand voltage (U_d)	U_d: 20 kV, 28 kV, 32 kV, 42 kV, 55 kV, 65 kV
Rated short-circuit breaking current (I_{sc})	I_{sc}: 16 kA to 40 kA
Rated normal current (I_r)	I_r: 800 A to 3150 A
Pole-center distance	150 mm to 275 mm
Width across flats	205 mm to 310 mm

These ratings define the positions 5 to 8 of the article number.

2nd step: Definition of the secondary equipment (see pages 35 to 40)

Please specify the following equipment features:	Possible options:
Release combination (position 9)	Shunt release, current-transformer-operated release and undervoltage release
Closing solenoid (position 10)	Operating voltages from 24 V DC to 240 V AC
Operating voltage of the releases (positions 11/12)	Operating voltages from 24 V DC to 240 V AC
Installation accessories (position 13)	Fixed mounting, with withdrawable part, with contact, fixed contact, bushing, cartridge, with/without earthing switch
Drive motor (position 14)	Operating voltages from 24 V DC to 240 V AC
Number of auxiliary contacts (position 15)	6 NO + 6 NC, 12 NO + 12 NC
Design of the secondary connection (position 15)	20-pole plug connector or 27-pole terminal strip, 24-pole plug, 64-pole plug
Mechanical interlocking, circuit breaker tripping signal (position 15)	With or without
Language of the documentation (position 16)	English, German, French, Spanish, Russian, further languages on request
Frequency of the operating voltage of the secondary equipment at AC (position 16)	DC or AC 50 Hz; 60 Hz

These equipment features define the positions 9 to 16 of the article number.

3rd step: Do you have any further requirements concerning the equipment? (Please refer to page 41)

Your Siemens sales partner will be pleased to support you.

For configuration of your
SION vacuum circuit breaker

1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16		
3	A	E	■	■	■	■	–	■	■	■	■	■	–	■	■	■	■	–	Z
					See page 18	to	See page 34		See page 35	See page 35	See page 36	See page 36		See pages 37+38	See page 38	See page 39	See page 40		See page 41
3	A	E					–						–						
				+				+				+				+			
				+				+				+				+			
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				+				+				+				+			

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Get more information

www.siemens.com/lowvoltage

Siemens AG
Energy Management
Low Voltage & Products
Postfach 10 09 53
93009 Regensburg
Germany

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KG 0418 .5 WÜ 82 En / Dispo 18301
Printed in Germany

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Siemens provides products and solutions with industrial security functions that support the secure operation of plants, systems, machines and networks.

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens' products and solutions constitute one element of such a concept.

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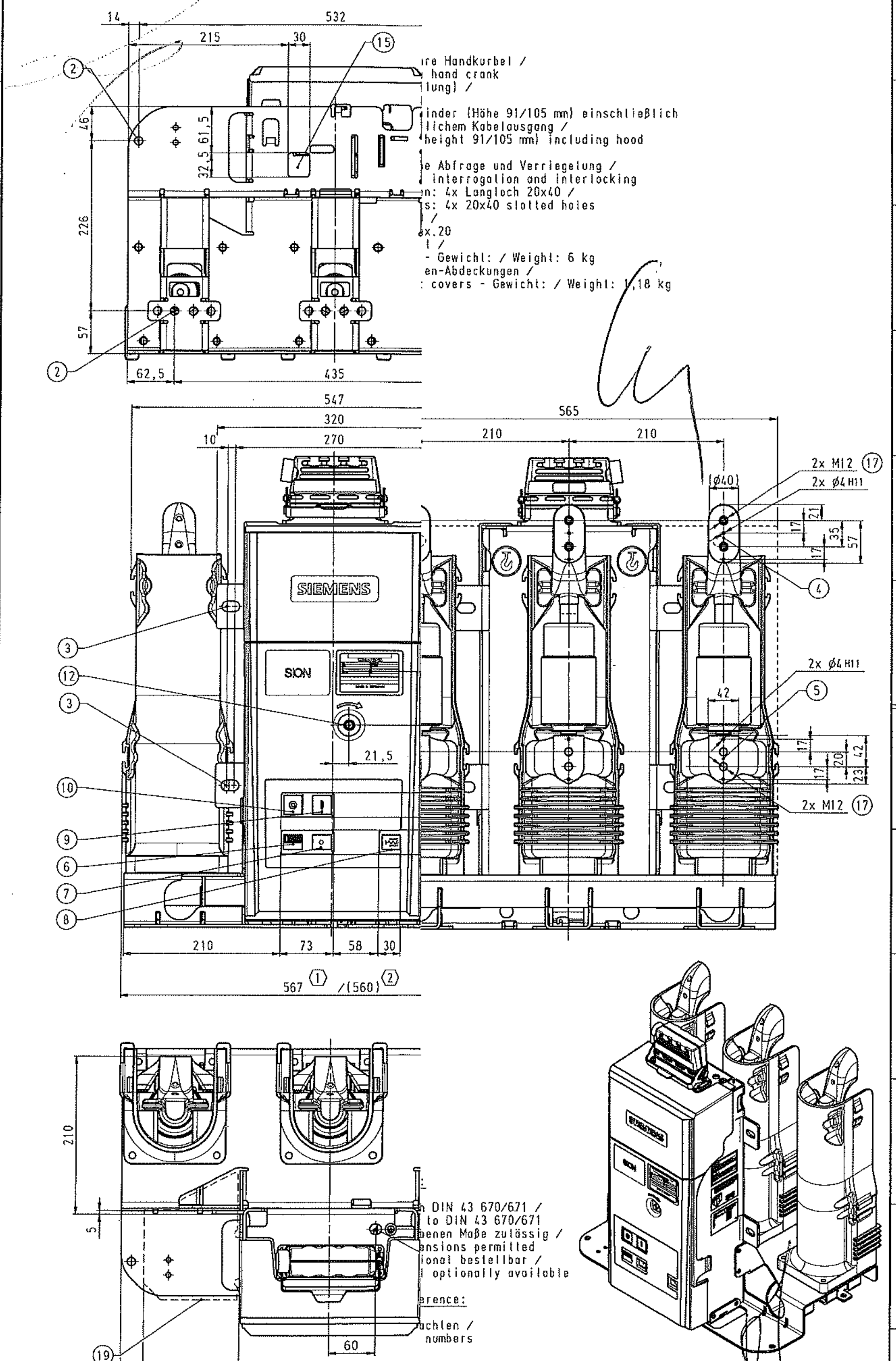

ıre Handkurbel /
: hand crank
ılung) /

ınder (Höhe 91/105 mm) einschließlich
llichem Kabelausgang /
height 91/105 mm) including hood

e Abfrage und Verriegelung /
interrogation and interlocking
n: 4x Langloch 20x40 /
s: 4x 20x40 slotted holes
) /
x.20
t /
- Gewicht: / Weight: 6 kg
en-Abdeckungen /
: covers - Gewicht: / Weight: 1,18 kg

n DIN 43 670/671 /
l to DIN 43 670/671
benen Maße zulässig /
ensions permitted
ional bestellbar /
l optionally available

erence:

achlen /
numbers

Finishing
Oberflaeche
-
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13-06-2014	BERNHARD	Date Datum	15-02-2013	Designation Benennung	ISO-Projection
Date Datum	Name Name	Name Name	Steinfurt	V-Leistungsschalter 3AE SION-M V-Circuit-Breaker 3AE SION M	
		Department Abteilung	R&D OC 2		
293226	0J	Location Standort	IC LMV HS / BLN		Page Blatt
Mod./Rel-No. Aend.-Vorg.-Nr.	Revision Revision	SIEMENS		Itemnumber Sachnummer 1M S_A7E_442_02024_001	1+

Prüffeld der Schaltwerke
Berlin

DAkkS
Deutsche
Akkreditierungsstelle
D-PL-11055-10-01

Test Document

Report No.: 12-087-MH **Copy No.:** 0 **Contents:** 16 **Sheets**

Test object: Three-pole vacuum circuit-breaker

Designation: 3AE5174-2 with vacuum interrupters VSA12-0-25
Rated voltage: 12 kV Rated normal current: 1250 A Rated frequency: 50/60 Hz
Rated short-circuit breaking current: 25 kA

Manufacturer: Siemens AG, IC LMV MS O-AIS SD BLN MF, Berlin

Client: Siemens AG, IC LMV MS R&D OC, Berlin

Testing station: Prüffeld der Schaltwerke, Berlin

Date of test: November 05, 2012

Applied test specifications:

IEC 62271-1, Edition 1.1, 2011-08
IEC 62271-100, Edition 2.1, 2012-09
DIN EN 62271-1/A1 (VDE 0671-1/A1), 2012-04
DIN EN 62271-100 (VDE 0671-100), 2009-12

Tests performed:

Dielectric tests, including:	
Short-duration power-frequency withstand voltage:	28 kV
Lightning impulse withstand voltage:	75 kV

ВЯРНО С
ОРИГИНАЛА

Test results:

The test object has passed the above indicated tests without any objection. The proved performance and the results obtained comply with the requirements mentioned above.

[redacted]

На основание чл.36а ал.3 от ЗОП

Head of Hi[redacted]ment

Berlin, April 30, 2013

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Addresses

Testing Station: Prüffeld der Schaltwerke, Berlin
Siemens AG
IC LMV MS R&D OC TD
Nonnendammallee 104
13629 Berlin
Germany

Manufacturer: Siemens AG
IC LMV MS O-AIS SD BLN MF
Nonnendammallee 104
13629 Berlin
Germany

Client: Siemens AG
IC LMV MS R&D OC
Nonnendammallee 104
13629 Berlin
Germany

Technical Data of Test Object

Circuit-Breaker

Test object:	Three-pole vacuum circuit-breaker
Designation:	3AE5174-2 with vacuum interrupters VSA12-0-25
Manufacturer:	Siemens AG, IC LMV MS O-AIS SD BLN MF, Berlin
Serial No.:	S 3AE5/00000002
Year of manufacture:	2012
Drawing No.:	Drawings and parts lists - see sheet 6

Ratings assigned by the manufacturer:

Rated voltage	12	kV	
Rated normal current	1250	A	
Rated frequency	50/60	Hz	
Rated lightning impulse withstand voltage	75	kV	
Rated switching impulse withstand voltage	-	kV	
Rated power-frequency withstand voltage	28	kV	
Rated peak withstand current	65	kA	
Rated short-time withstand current	25	kA	
Rated duration of short-circuit	3	s	
Rated short-circuit breaking current	25	kA	
DC component of the rated short-circuit breaking current (Valid at a minimum opening time of 21 ms, a relay-time of 10 ms and a time constant of 45 ms)	50	%	
Rated short-circuit making current	65	kA	
Rated transient recovery voltage	20.6	kV	
Rate of rise of transient recovery voltage	0.34	kV/µs	
First-pole-to-clear factor	1.5		
Rated operating sequence	O - 0.3 s - CO - 3 min - CO		
Arc extinguishing medium	Vacuum		
Rated filling pressure for interruption	-	MPa	abs. at 20 °C
Minimum functional pressure for interruption	-	MPa	abs. at 20 °C
Insulating medium	Air		
Rated filling pressure for insulation	-	MPa	abs. at 20 °C
Minimum functional pressure for insulation	-	MPa	abs. at 20 °C
Driving mechanism (type)	Spring, charged by motor		
Number of poles	3		
Number of units per pole	1		
Rated opening time	< 65	ms	
Rated closing time	< 75	ms	
Rated supply voltage of opening device	110	V	d.c.
Rated supply voltage of closing device	110	V	d.c.
Rated supply voltage of auxiliary circuits	110	V	d.c.
Rated frequency of supply voltage	-	Hz	
Rated line /cable-charging breaking current	10 / 25	A	
Rated single capacitor bank breaking current	400	A	
Classification of circuit-breaker	Class M2, E2, C2, S1		

Further data:

Serial number of vacuum interrupter in pole L1	S146117
Serial number of vacuum interrupter in pole L2	S146118
Serial number of vacuum interrupter in pole L3	S146119

ВЯРНО С ОРИГИНАЛА

Essential characteristics:

-

Prüffeld der Schaltwerke
Berlin

DAkkS
Deutsche
Akkreditierungsstelle
D-PL-11055-10-01

Test Report

Report No.: 12-092-MH **Copy No.:** 0 **Contents:** 16 **Sheets**

Test object:	Three-pole vacuum circuit-breaker
Designation:	3AE5124-2 with vacuum interrupters VSA12-0-25 Rated voltage: 12 kV Rated normal current: 1250 A Rated frequency: 50/60 Hz Rated short-circuit breaking current: 25 kA
Manufacturer:	Siemens AG, IC LMV MS O-AIS SD BLN MF, Berlin
Client:	Siemens AG, IC LMV MS R&D OC 2, Berlin
Testing station:	Prüffeld der Schaltwerke, Berlin
Date of test:	November 08, 2012

Applied test specifications:

IEC 62271-1, Edition 1.1, 2011-08	DIN EN 62271-1 (VDE 0671-1), 2009-08
IEC 62271-100, Edition 2.0, 2008-04	DIN EN 62271-100 (VDE 0671-100), 2009-12

Tests performed:

Dielectric tests, including:

Short-duration power-frequency withstand voltage:	42 kV
Lightning impulse withstand voltage:	75 kV

ВЯРНО С
ОРИГИНАЛА

Test results:

The test object has passed the above indicated tests without any objection. The proved performance and the results obtained comply with the requirements mentioned above.

На основание чл.36а ал.3 от ЗОП

Head of H [redacted]

Berlin, May 08, 2013

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A Test Confirmation

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Addresses

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Prüffeld der Schaltwerke, Berlin
Siemens AG
IC LMV MS R&D OC TD
Nonnendammallee 104
13629 Berlin
Germany

Manufacturer:
Siemens AG
IC LMV MS O-AIS SD BLN MF
Nonnendammallee 104
13629 Berlin
Germany

Client:
Siemens AG
IC LMV MS R&D OC 2
Nonnendammallee 104
13629 Berlin
Germany

Technical Data of Test Object
Circuit-Breaker

Test object: Three-pole vacuum circuit-breaker
Designation: 3AE5124-2 with vacuum interrupters VSA12-0-25
Manufacturer: Siemens AG, IC LMV MS O-AIS SD BLN MF, Berlin
Serial No.: 3AE5/00000001
Year of manufacture: 2012
Drawing No.: Drawings and parts lists - see sheet 6

Ratings assigned by the manufacturer:

Rated voltage	12	kV	
Rated normal current	1250	A	
Rated frequency	50/60	Hz	
Rated lightning impulse withstand voltage	75	kV	
Rated switching impulse withstand voltage	-	kV	
Rated power-frequency withstand voltage	42	kV	
Rated peak withstand current	63	kA	
Rated short-time withstand current	25	kA	
Rated duration of short-circuit	3	s	
Rated short-circuit breaking current	25	kA	
DC component of the rated short-circuit breaking current (Valid at a minimum opening time of 21 ms, a relay-time of 10 ms and a time constant of 45 ms)	50	%	
Rated short-circuit making current	65	kA	
Rated transient recovery voltage	20.6	kV	
Rate of rise of transient recovery voltage	0.34	kV/µs	
First-pole-to-clear factor	1.5		
Rated operating sequence	O - 0.3 s - CO - 3 min - CO		
Arc extinguishing medium	Vacuum		
Rated filling pressure for interruption	-	MPa	abs. at 20 °C
Minimum functional pressure for interruption	-	MPa	abs. at 20 °C
Insulating medium	Air		
Rated filling pressure for insulation	-	MPa	abs. at 20 °C
Minimum functional pressure for insulation	-	MPa	abs. at 20 °C
Driving mechanism (type)	Spring, charged by motor		
Number of poles	3		
Number of units per pole	1		
Rated opening time	< 65	ms	
Rated closing time	< 75	ms	
Rated supply voltage of opening device	110	V	d.c.
Rated supply voltage of closing device	110	V	d.c.
Rated supply voltage of auxiliary circuits	110	V	d.c.
Rated frequency of supply voltage	-	Hz	
Rated line /cable-charging breaking current	-/25	A	
Rated single capacitor bank breaking current	400	A	
Classification of circuit-breaker	Class M2, E2, C2, S1		

Further data:

Serial number of vacuum interrupter in pole L1	S 146116
Serial number of vacuum interrupter in pole L2	S 146115
Serial number of vacuum interrupter in pole L3	S 146114

Essential characteristics:

-

Prüffeld der Schaltwerke
Berlin

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D-PL-11055-10-01

Test Document

Report No.: 13-003-ME **Copy No.:** 0 **Contents:** 16 **Sheets**

Test object: Three-pole vacuum circuit-breaker

Designation: 3AE5124-2 with vacuum interrupters VSA12-0-25
Rated voltage: 12 kV Rated normal current: 1250 A Rated frequency: 50/60 Hz
Rated short-circuit breaking current: 25 kA

Manufacturer: Siemens AG, IC LMV MS O-AIS SD BLN MF, Berlin

Client: Siemens AG, IC LMV MS R&D OC, Berlin

Testing station: Prüffeld der Schaltwerke, Berlin

Date of test: December 10 - 12, 2012

Applied test specifications:

IEC 62271-1, Edition 1.1, 2011-08
IEC 62271-100, Edition 2.1, 2012-09

DIN EN 62271-1/A1 (VDE 0671-1/A1), 2012-04
DIN EN 62271-100 (VDE 0671-100), 2009-12

Tests performed:

Temperature-rise test at 50 Hz with rated normal current
Measurement of the resistance of the main circuit.

ВЯРНО С
ОРИГИНАЛА

Test results:

The test object has passed the above indicated tests without any objection. The proved performance and the results obtained comply with the requirements mentioned above.

He [redacted]

На основание чл.36а ал.3 от ЗОП

Berlin, January 29, 2013

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A Test Report

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A Test Confirmation

is issued immediately after the tests. It confirms that the tests have been conducted and is valid only until publishing the detailed results in an entire document.

Addresses

Testing Station:
Prüffeld der Schaltwerke, Berlin
Siemens AG
IC LMV MS R&D OC TD
Nonnendammallee 104
13629 Berlin
Germany

Manufacturer:
Siemens AG
IC LMV MS O-AIS SD BLN MF
Nonnendammallee 104
13629 Berlin
Germany

Client:
Siemens AG
IC LMV MS R&D OC 2
Nonnendammallee 104
13629 Berlin
Germany

ВЕРНО С
ОРИГИНАЛОМ

Technical Data of Test Object
Circuit-Breaker

Test object:	Three-pole vacuum circuit-breaker
Designation:	3AE5124-2 with vacuum interrupters VSA12-0-25
Manufacturer:	Siemens AG, IC LMV MS O-AIS SD BLN MF, Berlin
Serial No.:	S 3AE5/00000001
Year of manufacture:	2012
Drawing No.:	Drawings and parts lists - see sheet 6

Ratings assigned by the manufacturer:

Rated voltage	12	kV	
Rated normal current	1250	A	
Rated frequency	50/60	Hz	
Rated lightning impulse withstand voltage	75	kV	
Rated switching impulse withstand voltage	-	kV	
Rated power-frequency withstand voltage	28	kV	
Rated peak withstand current	65	kA	
Rated short-time withstand current	25	kA	
Rated duration of short-circuit	3	s	
Rated short-circuit breaking current	25	kA	
DC component of the rated short-circuit breaking current	50	% *	
Rated short-circuit making current	65	kA	
Rated transient recovery voltage	20.6	kV	
Rate of rise of transient recovery voltage	0.34	kV/µs	
First-pole-to-clear factor	1.5		
Rated operating sequence	O - 0.3 s - CO - 3 min - CO		
Arc extinguishing medium	Vacuum		
Rated filling pressure for interruption	-	MPa	abs. at 20 °C
Minimum functional pressure for interruption	-	MPa	abs. at 20 °C
Insulating medium	Air		
Rated filling pressure for insulation	-	MPa	abs. at 20 °C
Minimum functional pressure for insulation	-	MPa	abs. at 20 °C
Driving mechanism (type)	Spring, charged by motor		
Number of poles	3		
Number of units per pole	1		
Rated opening time	≤ 65	ms	
Rated closing time	≤ 75	ms	
Rated supply voltage of opening device	110	V	d.c.
Rated supply voltage of closing device	110	V	d.c.
Rated supply voltage of auxiliary circuits	110	V	d.c.
Rated frequency of supply voltage	-	Hz	
Rated line /cable-charging breaking current	-/25	A	
Rated single capacitor bank breaking current	400	A	
Classification of circuit-breaker	Class M2, E2, C2, S1		

Further data:

Serial number of vacuum interrupter in pole L1	146111
Serial number of vacuum interrupter in pole L2	146112
Serial number of vacuum interrupter in pole L3	146113

Essential characteristics:

* valid at a minimum opening time of 35 ms and a time constant of 45 ms

Prüffeld der Schaltwerke
Berlin

DAkkS
Deutsche
Akkreditierungsstelle
D-PL-11055-10-01

Test Document

Report No.: 13-035-MM **Copy No.:** 0 **Contents:** 22 **Sheets**

Test object: Three-pole vacuum circuit-breaker

Designation: 3AE5104-2 with vacuum interrupter VSA 12-0-25
Rated voltage: 12 kV Rated normal current: 1250 A Rated frequency: 50/60 Hz
Rated short-circuit breaking current: 25 kA

Manufacturer: Siemens AG, IC LMV MS O-AIS SD BLN MF, Berlin

Client: Siemens AG, IC LMV MS R&D OC, Berlin

Testing station: Prüffeld der Schaltwerke, Berlin

Date of test: March 20 – April 25, 2013

Applied test specifications:

IEC 62271-1, Edition 1.1, 2011-08
IEC 62271-100, Edition 2.1, 2012-09
DIN EN 62271-1/A1 (VDE 0671-1/A1), 2012-04
DIN EN 62271-100 (VDE 0671-100), 2009-12

Tests performed:

Extended mechanical endurance test on class M2 circuit-breaker - 10 000 operation sequences

Test results:

The test object has passed the above indicated tests without any objection. The proved performance and the results obtained comply with the requirements mentioned above.

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На основание чл.36а ал.3 от ЗОП

ВЯРНО С ОРИГИНАЛА

Berlin, May 08, 2013

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PSW-Documents

A Certificate

is issued for type tests which have successfully been carried out in full compliance with the relevant specifications or standards valid at the time of the test. For these tests the equipment under test must be clearly identified by technical description, drawings and additional specifications.

A Test Document

is issued for parts of type tests which have successfully been carried out in full compliance with the relevant specifications or standards valid at the time of test. For these tests the equipment under test must be clearly identified by technical description, drawings and additional specifications.

A Test Report

is issued for all other tests which have been carried out according to specifications, standards and/or clients instructions. Similarly, this test report contains all test results, details of the conditions under which the tests were carried out, also details relating to the behaviour of the equipment during test, and its condition after the tests.

A Test Confirmation

is issued immediately after the tests. It confirms that the tests have been conducted and is valid only until publishing the detailed results in an entire document.

Addresses

Testing Station:	Prüffeld der Schaltwerke, Berlin Siemens AG IC LMV MS R&D OC TD Nonnendammallee 104 13629 Berlin Germany
Manufacturer:	Siemens AG IC LMV MS O-AIS SD BLN MF Nonnendammallee 104 13629 Berlin Germany
Client:	Siemens AG IC LMV MS R&D OC Nonnendammallee 104 13629 Berlin Germany

Technical Data of Test Object
Circuit-Breaker

Test object:	Three-pole vacuum circuit-breaker
Designation:	3AE5104-2 with vacuum interrupter VSA 12-0-25
Manufacturer:	Siemens AG, IC LMV MS O-AIS SD BLN MF, Berlin
Serial No.:	3AE5/00000004
Year of manufacture:	2013
Drawing No.:	Drawings and parts lists - see sheet 6

Ratings assigned by the manufacturer:

Rated voltage	12	kV	
Rated normal current	1250	A	
Rated frequency	50/60	Hz	
Rated lightning impulse withstand voltage	75	kV	
Rated switching impulse withstand voltage	-	kV	
Rated power-frequency withstand voltage	28	kV	
Rated peak withstand current	65	kA	
Rated short-time withstand current	25	kA	
Rated duration of short-circuit	3	s	
Rated short-circuit breaking current	25	kA	
DC component of the rated short-circuit breaking current (Valid at a minimum opening time of 21 ms, a relay-time of 10 ms and a time constant of 45 ms)	50	%	
Rated short-circuit making current	65	kA	
Rated transient recovery voltage	20.6	kV	
Rate of rise of transient recovery voltage	0.34	kV/µs	
First-pole-to-clear factor	1.5		
Rated operating sequence	O - 0.3 s - CO - 3 min - CO		
Arc extinguishing medium	Vacuum		
Rated filling pressure for interruption	-	MPa	abs. at 20 °C
Minimum functional pressure for interruption	-	MPa	abs. at 20 °C
Insulating medium	Air		
Rated filling pressure for insulation	-	MPa	abs. at 20 °C
Minimum functional pressure for insulation	-	MPa	abs. at 20 °C
Driving mechanism (type)	Spring, charged by motor		
Number of poles	3		
Number of units per pole	1		
Rated opening time	< 65	ms	
Rated closing time	< 75	ms	
Rated supply voltage of opening device	110	V	d.c.
Rated supply voltage of closing device	110	V	d.c.
Rated supply voltage of auxiliary circuits	110	V	d.c.
Rated frequency of supply voltage	-	Hz	
Rated line /cable-charging breaking current	-/25	A	
Rated single capacitor bank breaking current	400	A	
Classification of circuit-breaker	Class M2, E2, C2, S1		

Further data:

Serial number of vacuum interrupter in pole L1	S 000131
Serial number of vacuum interrupter in pole L2	S 000134
Serial number of vacuum interrupter in pole L3	S 000114

ВЯРНО С
ОРИГИНАЛА

Essential characteristics:

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Prüffeld der Schaltwerke
Berlin

DAkkS
Deutsche
Akkreditierungsstelle
D-PL-11055-10-01

Test Document

Report No.: 13-036-MM **Copy No.:** 0 **Contents:** 18 **Sheets**

Test object: Three-pole vacuum circuit-breaker

Designation: 3AE5184-2 with vacuum interrupters VSA12-0-25
Rated voltage: 12 kV Rated normal current: 1250 A Rated frequency: 50/60 Hz
Rated short-circuit breaking current: 25 kA

Manufacturer: Siemens AG, IC LMV MS O-AIS SD BLN MF, Berlin

Client: Siemens AG, IC LMV MS R&D OC, Berlin

Testing station: Prüffeld der Schaltwerke, Berlin

Date of test: April 15 - 25, 2013

Applied test specifications:

IEC 62271-1, Edition 1.1, 2011-08
IEC 62271-100, Edition 2.1, 2012-09
DIN EN 62271-1/A1 (VDE 0671-1/A1), 2012-04
DIN EN 62271-100 (VDE 0671-100), 2009-12

Tests performed:

Low and high temperature Test (-25°C/+40°C).

Test results:

The test object has passed the above indicated tests without any objection. The proved performance and the results obtained comply with the requirements mentioned above.

Berlin, June 19, 2013

На основание чл.36а ал.3 от ЗОП

[redacted]

ВЯРНО С
ОРИГИНАЛА

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A Test Confirmation

is issued immediately after the tests. It confirms that the tests have been conducted and is valid only until publishing the detailed results in an entire document.

Addresses

Testing Station: Prüffeld der Schaltwerke, Berlin
Siemens AG
IC LMV MS R&D OC TD
Nonnendammallee 104
13629 Berlin
Germany

Manufacturer: Siemens AG
IC LMV MS O-AIS SD BLN MF
Nonnendammallee 104
13629 Berlin
Germany

Client: Siemens AG
IC LMV MS R&D OC
Nonnendammallee 104
13629 Berlin
Germany

Technical Data of Test Object
Circuit-Breaker

Test object:	Three-pole vacuum circuit-breaker
Designation:	3AE5184-2 with vacuum interrupters VSA12-0-25
Manufacturer:	Siemens AG, IC LMV MS O-AIS SD BLN MF, Berlin
Serial No.:	S3AE5/00000009
Year of manufacture:	2013
Drawing No.:	Drawings and parts lists - see sheet 6

Ratings assigned by the manufacturer:

Rated voltage	12	kV	
Rated normal current	1250	A	
Rated frequency	50/60	Hz	
Rated lightning impulse withstand voltage	75	kV	
Rated switching impulse withstand voltage	-	kV	
Rated power-frequency withstand voltage	42	kV	
Rated peak withstand current	65	kA	
Rated short-time withstand current	25	kA	
Rated duration of short-circuit	3	s	
Rated short-circuit breaking current	25	kA	
DC component of the rated short-circuit breaking current (Valid at a minimum opening time of 21 ms, a relay-time of 10 ms and a time constant of 45 ms)	50	%	
Rated short-circuit making current	65	kA	
Rated transient recovery voltage	20.6	kV	
Rate of rise of transient recovery voltage	0.34	kV/µs	
First-pole-to-clear factor	1.5		
Rated operating sequence	O - 0.3 s - CO - 3 min - CO		
Arc extinguishing medium	Vacuum		
Rated filling pressure for interruption	-	MPa	abs. at 20 °C
Minimum functional pressure for interruption	-	MPa	abs. at 20 °C
Insulating medium	Air		
Rated filling pressure for insulation	-	MPa	abs. at 20 °C
Minimum functional pressure for insulation	-	MPa	abs. at 20 °C
Driving mechanism (type)	Spring, charged by motor		
Number of poles	3		
Number of units per pole	1		
Rated opening time	< 60	ms	
Rated closing time	< 60	ms	
Rated supply voltage of opening device	110	V	d.c.
Rated supply voltage of closing device	110	V	d.c.
Rated supply voltage of auxiliary circuits	110	V	d.c.
Rated frequency of supply voltage	-	Hz	
Rated line /cable-charging breaking current	- / 25	A	
Rated single capacitor bank breaking current	400	A	
Classification of circuit-breaker	Class M2, E2, C2, S1		

Further data:

Serial number of vacuum interrupter in pole L1	S000157
Serial number of vacuum interrupter in pole L2	S000159
Serial number of vacuum interrupter in pole L3	S000158

Essential characteristics:

-

Prüffeld der Schaltwerke
Berlin

DAkkS
Deutsche
Akkreditierungsstelle
D-PL-11055-10-01

Test Document

Report No.: 13-038-MH **Copy No.:** 0 **Contents:** 20 **Sheets**

Test object: Three-pole vacuum circuit-breaker
Designation: 3AE5174-2 with vacuum interrupters VSA12-0-25
Rated voltage: 12 kV Rated normal current: 1250 A Rated frequency: 50/60 Hz
Rated short-circuit breaking current: 25 kA
Manufacturer: Siemens AG, IC LMV MS O-AIS SD BLN ME, Berlin
Client: Siemens AG, IC LMV MS R&D OC 2, Berlin
Testing station: Prüffeld der Schaltwerke, Berlin
Date of test: April 26, 2013

Applied test specifications:

IEC 62271-1, Edition 1.1, 2011-08
IEC 62271-100, Edition 2.0, 2008-04
DIN EN 62271-1 (VDE 0671-1), 2009-08
DIN EN 62271-100 (VDE 0671-100), 2009-12

Tests performed:

Short-duration power-frequency withstand voltage test on auxiliary and control circuits (2 kV)

Test results:

The test object has passed the above indicated tests without any objection. The proved performance and the results obtained comply with the requirements mentioned above.

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На основание чл.36а ал.3 от ЗОП

ВЯРНО С
ОРИГИНАЛА

Berlin, July 04, 2013

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is issued immediately after the tests. It confirms that the tests have been conducted and is valid only until publishing the detailed results in an entire document.

Addresses

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Siemens AG
IC LMV MS R&D OC TD
Nonnendammallee 104
13629 Berlin
Germany

Manufacturer: Siemens AG
IC LMV MS O-AIS SD BLN ME
Nonnendammallee 104
13629 Berlin
Germany

Client: Siemens AG
IC LMV MS R&D OC 2
Nonnendammallee 104
13629 Berlin
Germany

Technical Data of Test Object
Circuit-Breaker

Test object: Three-pole vacuum circuit-breaker
Designation: 3AE5174-2 with vacuum interrupters VSA12-0-25
Manufacturer: Siemens AG, IC LMV MS O-AIS SD BLN ME, Berlin
Serial No.: 3AE5/00000008
Year of manufacture: 2013
Drawing No.: Drawings and parts lists - see sheet 6

Ratings assigned by the manufacturer:

Rated voltage	12	kV	
Rated normal current	1250	A	
Rated frequency	50/60	Hz	
Rated lightning impulse withstand voltage	75	kV	
Rated switching impulse withstand voltage	-	kV	
Rated power-frequency withstand voltage	28	kV	
Rated peak withstand current	65	kA	
Rated short-time withstand current	25	kA	
Rated duration of short-circuit	3	s	
Rated short-circuit breaking current	25	kA	
DC component of the rated short-circuit breaking current (Valid at a minimum opening time of 21 ms, a relay-time of 10 ms and a time constant of 45 ms)	50	%	
Rated short-circuit making current	65	kA	
Rated transient recovery voltage	20.6	kV	
Rate of rise of transient recovery voltage	0.34	kV/µs	
First-pole-to-clear factor	1.5		
Rated operating sequence	O - 0.3 s - CO - 3 min - CO		
Arc extinguishing medium	Vacuum		
Rated filling pressure for interruption	-	MPa	abs. at 20 °C
Minimum functional pressure for interruption	-	MPa	abs. at 20 °C
Insulating medium	Air		
Rated filling pressure for insulation	-	MPa	abs. at 20 °C
Minimum functional pressure for insulation	-	MPa	abs. at 20 °C
Driving mechanism (type)	Spring, charged by motor		
Number of poles	3		
Number of units per pole	1		
Rated opening time	< 65	ms	
Rated closing time	< 75	ms	
Rated supply voltage of opening device	110	V	d.c.
Rated supply voltage of closing device	110	V	d.c.
Rated supply voltage of auxiliary circuits	110	V	d.c.
Rated frequency of supply voltage	-	Hz	
Rated line /cable-charging breaking current	-/25	A	
Rated single capacitor bank breaking current	400	A	
Classification of circuit-breaker	Class M2, E2, C2, S1		

Further data:

Serial number of vacuum interrupter in pole L1	S 000136
Serial number of vacuum interrupter in pole L2	S 000148
Serial number of vacuum interrupter in pole L3	S 000149

ВЯРНО С ОРИГИНАЛА

Essential characteristics:

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SIEMENS

Infrastructure & Cities

TVM **11225a**

Test Documents
for Vacuum Circuit-Breaker
3AE5183-1
(12 kV, 20 kA, 800 A)

The vacuum circuit-breakers of type 3AE were type tested in accordance with

IEC Publication 62271-1, Edition 1.1, 2011-08,
IEC Publication 62271-100, Edition 2.1, 2012-09 and the relevant harmonisation documents.

For vacuum circuit-breaker 3AE5183-1 the following test documents are valid:

Type Tests	Rated Values	Test Documents
Dielectric tests	U_P = 75 kV U_d = 28 kV	12-087-MH
Temperature-rise tests	I_r = 800 A	13-003-ME
Mechanical operation test at ambient temperature, Low and high temperature tests	10.000 op. Cycles -5 / +55 °C	13-035-MM
Short-time withstand current and peak withstand current tests	I_{sc} = 20 kA/3s I_{ma} = 50 kA	12-090-MS
Short-circuit making and breaking tests	I_{sc} = 20 kA I_{ma} = 50 kA	12-089-MS

На основание чл.36а ал.3 от ЗОП

[redacted]

SIEMENS AG

ВЯРНО С ОРИГИНАЛА

Berlin, June 28, 2013

Siemens AG
Infrastructure & Cities Sector; Leitung: Roland Busch
Low and Medium Voltage Division; Leitung: Ralf Christian
Medium Voltage & Systems; Leitung: Stephan May

Nonnendammallee 104
13629 Berlin
Deutschland

Tel.: +49 (30) 386 0

Test Documents
for Vacuum Circuit-Breaker
3AE5183-1
(12 kV, 20 kA, 800 A)

If a test is carried out with a vacuum circuit-breaker with different order number, the validity of the test document is given by the following statements:

The listed test documents for the mentioned vacuum circuit-breaker are valid in respect to familiar design of the vacuum circuit-breakers, as the construction of the main current path and mechanical driving mechanism is nearly identical.

ВЯРНО С
ОРИГИНАЛА

На основание чл.36а ал.3 от ЗОП

Berlin, June 28, 2013

Siemens AG
Infrastructure & Cities Sector; Leitung: Roland Busch
Low and Medium Voltage Division; Leitung: Ralf Christian
Medium Voltage & Systems; Leitung: Stephan May

Nonnendammallee 104
13629 Berlin
Deutschland

Tel.: +49 (30) 386 0

Siemens Aktiengesellschaft: Vorsitzender des Aufsichtsrats: Gerhard Cromme; Vorstand: Peter Löscher, Vorsitzender; Roland Busch, Brigitte Ederer, Klaus Helmrich, Joe Kaeser, Barbara Kux, Hermann Requardt, Siegfried Russwurm, Peter Y. Solmssen, Michael Süß
Sitz der Gesellschaft: Berlin und München, Deutschland; Registergericht: Berlin Charlottenburg, HRB 12300, München, HRB 6684
WEEE-Reg.-Nr. DE 23691322

Test Documents
for Vacuum Circuit-Breaker
3AE5183-1
(12 kV, 20 kA, 800 A)

In addition to the type tests in accordance with IEC 62271-1 and IEC 62271-100 the following tests were carried out:

Type Tests	**Test Documents**
Single-phase and double earth fault tests	12-089-MS
Capacitive current switching tests: -cable-charging current breaking tests	11K0182-S

ВЯРНО С
ОРИГИНАЛА

На основание чл.36а ал.3 от ЗОП

Berlin, June 28, 2013

SIEMENS

Инфраструктура & Градове

TVM 11231a

Тестов документ
за вакуумен мощностен прекъсвач
3AE5183-1
(12kV, 20kA, 800A)

вакуумен мощностен прекъсвач 3AE е типово тестван в съответствие с

IEC 62271-1 версия 1.1,2011-08
IEC 62271-100, версия 2.1, 2012-09 и съответните хармонизиращи документи

за вакуумен мощностен прекъсвач 3AE5183-1 долупосочените тестове са валидни

Изпитания	Стойност	Документ
Диелектрични изпитание на изолацията	U_p = 75kV U_d = 28kV	12-087-MH
Изпитание за температурна устойчивост	I_r= 800 A	13-003-ME
Изпитания за механична устойчивост при температура на околната среда, ниска и висока температура	10.000 Цикъла -5/ +55 °C	13-035-MM
Изпитания за устойчивост на върхов и ток на късо съединение	I_{sc} =20kA/3s I_{ma} =50kA	12-090-MS
Изпитания за термична и динамична устойчивост	I_{sc} =20kA I_{ma} =50kA	12-089-MS

Др. Фройндт */подпис, не се чете/*

IC LMV MS R&D OC

Берлин, 28 Юни 2013 */печат на Siemens AG, не се чете/*

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Siemens AG
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Направление LMV; Мениджър: Ралф Кристиан
Средно напрежение & Системи; Мениджър: Стефан Мей

Нонендамеле 104
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Тел. +49 (30) 386 0

Siemens Aktiengesellschaft: Председател на борда: Герхард Хром; Борд: Питър Льошер, Председател; Роланд Буш, Бригит Едерер, Клаус Хелмрих, Джо Кезер, Барбара Кух, Херман Регардт, Сигфрид Русвурм, Питър Солмсен, Михаел Зус
Седалище: Берлин и Мюнхен, Германия; Регистрация: Берлин Шарлотенбург, HRB 12300, Мюнхен, HRB 6684
WEEE-Рег.-№. DE 23691322

SIEMENS

Инфраструктура & Градове
TVM 11231a

Тестов документ
за вакуумен мощностен прекъсвач 3AE5183-1
(12kV, 20kA, 800A)

Ако се провежда изпитване с вакуумен прекъсвач с различен поръчков номер, валидността на документа за изпитване се дава чрез следните изявления:

Изброените тестови документи за посочения вакуумен прекъсвач са валидни поради сходен дизайн на вакуумните прекъсвачи и предвид, че конструкцията на пътя на основния ток и механичният задвижващ механизъм са почти еднакви.

Др. Фройндт */подпис, не се чете/*

IC LMV MS R&D OC

Берлин, 28 Юни 2013 */печат на Siemens AG, не се чете/*

ВЯРНО С
ОРИГИНАЛА

Siemens AG
Сектор IC LMV: Мениджър Роланд Буш
Направление LMV; Мениджър: Ралф Кристиан
Средно напрежение & Системи; Мениджър: Стефан Мей

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Siemens Aktiengesellschaft: Председател на борда: Герхард Хром; Борд: Питър Льошер, Председател;
Роланд Буш, Бригит Едерер, Клаус Хелмрих, Джо Кезер, Барбара Кух, Херман Регардт, Сигфрид Русвурм, Питър Солмсен, Михаел Зус
Седалище: Берлин и Мюнхен, Германия; Регистрация: Берлин Шарлотенбург, HRB 12300, Мюнхен, HRB 6684
WEEE-Рег.-№. DE 23691322

SIEMENS

Инфраструктура & Градове
TVM 11231a

Тестов документ
за вакуумен мощностен прекъсвач
3AE5183-1
(12kV, 20kA, 800A)

В допълнение към типовите изпитания в съответствие с IEC 62271-1 и IEC 62271-100 са извършени следните тестове:

Изпитания	Документ
Изпитания за еднофазно и двуфазно земно късо съединение	12-089-MS
Изпитания с капацитивен ток	11K0182-S

Др. Фройндт */подпис, не се чете/*

IC LMV MS R&D OC

Берлин, 28 Юни 2013 */печат на Siemens AG, не се чете/*

ВЯРНО С ОРИГИНАЛА

Siemens AG
Сектор IC LMV: Мениджър Роланд Буш
Направление LMV; Мениджър: Ралф Кристиан
Средно напрежение & Системи; Мениджър: Стефан Мей

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Седалище: Берлин и Мюнхен, Германия; Регистрация: Берлин Шарлотенбург, HRB 12300, Мюнхен, HRB 6684
WEEE-Рег.-№. DE 23691322

SIEMENS

Infrastructure & Cities

TVM **11231a**

Test Documents
for Vacuum Circuit-Breaker
3AE5183-2
(12 kV, 20 kA, 1250 A)

The vacuum circuit-breakers of type 3AE were type tested in accordance with

IEC Publication 62271-1, Edition 1.1, 2011-08,
IEC Publication 62271-100, Edition 2.1, 2012-09 and the relevant harmonisation documents.

For vacuum circuit-breaker 3AE5183-2 the following test documents are valid:

Type Tests	**Rated Values**	**Test Documents**
Dielectric tests	U_P = 75 kV U_d = 28 kV	12-087-MH
Temperature-rise tests	I_r = 1250 A	13-003-ME
Mechanical operation test at ambient temperature, Low and high temperature tests	10.000 op. Cycles -5 / +55 °C	13-035-MM
Short-time withstand current and peak withstand current tests	I_{sc} = 20 kA/3s I_{ma} = 50 kA	12-090-MS
Short-circuit making and breaking tests	I_{sc} = 20 kA I_{ma} = 50 kA	12-089-MS

На основание чл.36а ал.3 от ЗОП

[redacted]

SIEMENS AG

Berlin, June 28, 2013

ВЯРНО С ОРИГИНАЛА

Siemens AG
Infrastructure & Cities Sector; Leitung: Roland Busch
Low and Medium Voltage Division; Leitung: Ralf Christian
Medium Voltage & Systems; Leitung: Stephan May

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Deutschland

Tel.: +49 (30) 386 0

SIEMENS

Infrastructure & Cities

TVM **11231a**

Test Documents
for Vacuum Circuit-Breaker
3AE5183-2
(12 kV, 20 kA, 1250 A)

If a test is carried out with a vacuum circuit-breaker with different order number, the validity of the test document is given by the following statements:

The listed test documents for the mentioned vacuum circuit-breaker are valid in respect to familiar design of the vacuum circuit-breakers, as the construction of the main current path and mechanical driving mechanism is nearly identical.

ВЯРНО С
ОРИГИНАЛА

На основание чл.36а ал.3 от ЗОП

Berlin, June 28, 2013

Test Documents
for Vacuum Circuit-Breaker
3AE5183-2
(12 kV, 20 kA, 1250 A)

In addition to the type tests in accordance with IEC 62271-1 and IEC 62271-100 the following tests were carried out:

Type Tests	**Test Documents**
Single-phase and double earth fault tests	12-089-MS
Capacitive current switching tests: -cable-charging current breaking tests	11K0182-S

ВЯРНО С
ОРИГИНАЛА

На основание чл.36а ал.3 от ЗОП

Berlin, June 28, 2013

SIEMENS

Инфраструктура & Градове

TVM 11231a

Тестов документ
за вакуумен мощностен прекъсвач
3AE5183-2
(12kV, 20kA, 1250A)

вакуумен мощностен прекъсвач 3AE е типово тестван в съответствие с

IEC 62271-1 версия 1.1,2011-08
IEC 62271-100, версия 2.1, 2012-09 и съответните хармонизиращи документи

за вакуумен мощностен прекъсвач 3AE5183-2 долупосочените тестове са валидни

Изпитания	Стойност	Документ
Диелектрични изпитание на изолацията	U_p = 75kV U_d = 28kV	12-087-MH
Изпитание за температурна устойчивост	I_r= 1250 A	13-003-ME
Изпитания за механична устойчивост при температура на околната среда, ниска и висока температура	10.000 Цикъла -5/ +55 °C	13-035-MM
Изпитания за устойчивост на върхов и ток на късо съединение	I_{sc} =20kA/3s I_{ma} =50kA	12-090-MS
Изпитания за термична и динамична устойчивост	I_{sc} =20kA I_{ma} =50kA	12-089-MS

Др. Фройндт */подпис, не се чете/*

IC LMV MS R&D OC

ВЯРНО С ОРИГИНАЛА

Siemens AG
Сектор IC LMV: Мениджър Роланд Буш
Направление LMV; Мениджър: Ралф Кристиан
Средно напрежение & Системи; Мениджър: Стефан Мей

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WEEE-Рег.-№. DE 23691322

SIEMENS

Инфраструктура & Градове
TVM 11231a

Берлин, 28 Юни 2013

Тестов документ
за вакуумен мощностен прекъсвач 3AE5183-2
(12kV, 20kA, 1250A)

Ако се провежда изпитване с вакуумен прекъсвач с различен поръчков номер, валидността на документа за изпитване се дава чрез следните изявления:

Изброените тестови документи за посочения вакуумен прекъсвач са валидни поради сходен дизайн на вакуумните прекъсвачи и предвид, че конструкцията на пътя на основния ток и механичният задвижващ механизъм са почти еднакви.

Др. Фройндт */подпис, не се чете/*

Siemens AG
Сектор IC LMV: Мениджър Роланд Буш
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IC LMV MS R&D OC

Инфраструктура & Градове

TVM 11231a

Берлин, 28 Юни 2013

Тестов документ
за вакуумен мощностен прекъсвач
3AE5183-2
(12kV, 20kA, 1250A)

В допълнение към типовите изпитания в съответствие с IEC 62271-1 и IEC 62271-100 са извършени следните тестове:

Изпитания	Документ
Изпитания за еднофазно и двуфазно земно късо съединение	12-089-MS
Изпитания с капацитивен ток	11K0182-S

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IC LMV MS R&D OC

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Тел. +49 (30) 386 0

Берлин, 28 Юни 2013

ВЯРНО С ОРИГИНАЛА

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Сектор IC LMV: Мениджър Роланд Буш
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WEEE-Рег.-№. DE 23691322

SIEMENS

Siemens AG, EM LP PRM MV, Nonnendammallee 104, 13629 Berlin

To whom it may confirm

Name	Bernhard Boës
Department	EM LP PRM MV
Mobile	+49 (173) 3825152
E-mail	Bernhard.Boes@siemens.com
Our reference	S0958E
Date	December 10, 2018

Confirmation of validity of design of 3AE51

We herewith confirm that three-pole Siemens vacuum circuit breaker type SION 3AE51 for
Ratings up to 12 kV – 20 kA – 800 and 1250 A equipped with Siemens vacuum interrupters type VSA12-0-25
is able to interrupt 1 200 operations at short-circuit breaking current up to 5 kA or alternative
10 000 operations at load current.
The tests were carried out based on the class E2 procedure.

Siemens Aktiengesellschaft

На основание чл.36а ал.3 от ЗОП

На основание чл.36а ал.3 от ЗОП

ВЯРНО С ОРИГИНАЛА

Siemens AG
Energy Management Division; Management: Ralf Christian
Low Voltage & Products; Management: Andreas Matthe

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13629 Berlin
Germany

Tel.: +49 (30) 386 0

SIEMENS

Siemens AG, EM LP PRM MV, Nonnendammallee 104, 13629 Berlin

To whom it may confirm

Name Bernhard Boës
Department EM LP PRM MV

Mobile +49 (173) 3825152
E-mail Bernhard.Boes@siemens.com

Our reference S0959E
Date December 10, 2018

Confirmation of validity of design of 3AE53

We herewith confirm that three-pole Siemens vacuum circuit breaker type SION 3AE53 for Ratings up to 24 kV – 20 kA – 800 and 1250 A equipped with Siemens vacuum interrupters type VSS12-1-31-A5 is able to interrupt 1 200 operations at short-circuit breaking current up to 5 kA or alternative 10 000 operations at load current.
The tests were carried out based on the class E2 procedure.

Siemens Aktiengesellschaft

На основание чл.36а ал.3 от ЗОП

SIEMENS AG

На основание чл.36а ал.3 от ЗОП

ВЯРНО С
ОРИГИНАЛА

Siemens AG
Energy Management Division; Management: Ralf Christian
Low Voltage & Products; Management: Andreas Matthe

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Germany

Tel.: +49 (30) 386 0

Siemens Aktiengesellschaft: Chairman of the Supervisory Board: Gerhard Cromme;
Managing Board: Joe Kaeser, Chairman, President and Chief Executive Officer; Roland Busch, Lisa Davis, Klaus Helmrich, Janina Kugel, Siegfried Russwurm, Ralf P. Thomas
Registered offices: Berlin and Munich, Germany; Commercial registries: Berlin Charlottenburg, HRB 12300, Munich, HRB 6684
WEEE-Reg.-No. DE 23691322

SCF 02/2015 V13.06

Page 1 of 1

Deutsche Akkreditierungsstelle GmbH
(Германски акредитационен орган ГмбХ)

Упълномощен в съответствие с Подраздел 1 на Раздел 8 на AkkStelleG във връзка с Подраздел 1 на Раздел 1 на AkkStelleG
Подписал Многостранните споразумения на ЕА, ILAF и IAF за взаимно признаване

Акредитация

Deutsche Akkreditierungsstelle GmbH (Германски акредитационен орган ГмбХ) удостоверява, че изпитвателната лаборатория

PEHLA – Gesellschaft für Elektrische Hochleistrungsprüfungen GbR
Hallenweg 40, 68219 Mannheim
(ПЕХЛА – Гезелшафт фюр Електрише Хохлайщрунгспрюфунген ГбР
Халенвег 40, 68219 Манхайм)

Метсоположение:
PEHLA – Gesellschaft für Elektrische Hochleistrungsprüfungen GbR (ПЕХЛА – Гезелшафт фюр Електрише Хохлайщрунгспрюфунген ГбР)
PEHLA-Prüffeld Berlin-Siemensstadt (ПЕХЛА-Прюфелд Берлин-Сименсщат)
Нонендамалее 104, 13629 Берлин

е компетентна по условията на DIN EN ISO/IEC 17025:2005 да извършва изпитания в следните области:

Комутационна апаратура и управляваща апаратура за високо напрежение
Енергетично оборудване

Акредитационният сертификат важи във връзка с известието за акредитация от 26.02.2016 г. с акредитационен номер D-PL-12072-04 и е валиден до 25.02.2021 г. Той се състои от заглавния лист, обратната страна на заглавния лист и следващия анекс с общо 12 страници.

Регистрационен номер на сертификата: **D-PL-12072-04-00**

Франкфурт на Майн, 26.02.2016 г.

/подпис – не се чете/
инж. Ралф Егнер
Ръководител отделение

ВЯРНО С ОРИГИНАЛА

Този документ е превод. Определящата версия е оригиналният германски акредитационен сертификат.

Вж. забележките на обратната страна на листа.

Deutsche Akkreditierungsstelle GmbH
(Германски акредитационен орган ГмбХ)

Офис Берлин
Шпителмаркт 10
10117 Берлин

Офис Франкфурт на Майн
Еуропа алее 52
60327 Франкфурт на Майн

Офис Брауншвайг
Бундесалее 100
38116 Брауншвайг

Публикуването на извадки от акредитационния сертификат подлежи на предварително писмено одобрение от Deutsche Akkreditierungsstelle GmbH (DAkkS). Изключение е непромененаната форма на отделни разпространения на заглавния лист от споменатия на обратната страна на листа орган за оценка на съответствието.

Не трябва да се създава впечатление, че акредикацията е разширена до области извън обхвата на акредитация , удостоверен от DAkkS.

Акредитацията е дадена съгласно Закона за акредитационния орган (AkkStelleG) от 31 юли 2009 г. (Вестник за федерални закони I стр. 2625) и РЕГЛАМЕНТ (ЕО) № 765/2008 на Европейския парламент и на Съвета от 9 юли 2008 г. за определяне на изискванията за акредитация и надзор на пазара във връзка с предлагането на пазара на продукти (Официален вестник на Европейския съюз L 218 от 9 юли 2008 г., стр. 30). DAkkS е подписал Многостранното споразумение за взаимно признаване на европейското сътрудничество за акредитация (EA), Международния акредитационен форум (IAF) и Международното сътрудничество за акредитиране на лаборатории (ILAC). Подписалите тези споразумения признават взаимно своите акредитации.

Текущото състояние на членството може да бъде намерено на следните уебсайтове:
EA: www.european-accreditation.org
ILAC: www. ilac.org
IAF: www.iaf.nu

ВЯРНО С
ОРИГИНАЛА

DAkkS
Deutsche
Akkreditierungsstelle

Deutsche Akkreditierungsstelle GmbH

Entrusted according to Section 8 subsection 1 AkkStelleG in connection with Section 1 subsection 1 AkkStelleGBV
Signatory to the Multilateral Agreements of
EA, ILAC and IAF for Mutual Recognition

Accreditation

The Deutsche Akkreditierungsstelle GmbH attests that the testing laboratory

PEHLA - Gesellschaft für elektrische Hochleistungsprüfungen
Hallenweg 40, 68219 Mannheim

Standort:
PEHLA - Gesellschaft für Elektrische Hochleistungsprüfungen
PEHLA-Prüffeld Berlin-Siemensstadt
Nonnendammallee 104, 13629 Berlin

is competent under the terms of DIN EN ISO/IEC 17025:2005 to carry out tests in the following fields:

High-Voltage Switchgear and Controlgear
Power Engineering Equipment

The accreditation certificate shall only apply in connection with the notice of accreditation of 2016-02-26 with the accreditation number D-PL-12072-04 and is valid until 2021-02-25. It comprises the cover sheet, the reverse side of the cover sheet and the following annex with a total of 12 pages.

Registration number of the certificate: **D-PL-12072-04-00**

На основание чл.36а ал.3 от ЗОП

[redacted]

Frankfurt am Main, 2016-02-26	Ralf Egner Head of Division	Translation issued: 2016-03-04

This document is a translation. The definitive version is the original German accreditation certificate.

See notes overleaf.

Deutsche Akkreditierungsstelle GmbH

Office Berlin
Spittelmarkt 10
10117 Berlin

Office Frankfurt am Main
Europa-Allee 52
60327 Frankfurt am Main

Office Braunschweig
Bundesallee 100
38116 Braunschweig

The publication of extracts of the accreditation certificate is subject to the prior written approval by Deutsche Akkreditierungsstelle GmbH (DAkkS). Exempted is the unchanged form of separate disseminations of the cover sheet by the conformity assessment body mentioned overleaf.

No impression shall be made that the accreditation also extends to fields beyond the scope of accreditation attested by DAkkS.

The accreditation was granted pursuant to the Act on the Accreditation Body (AkkStelleG) of 31 July 2009 (Federal Law Gazette I p. 2625) and the Regulation (EC) No 765/2008 of the European Parliament and of the Council of 9 July 2008 setting out the requirements for accreditation and market surveillance relating to the marketing of products (Official Journal of the European Union L 218 of 9 July 2008, p. 30). DAkkS is a signatory to the Multilateral Agreements for Mutual Recognition of the European co-operation for Accreditation (EA), International Accreditation Forum (IAF) and International Laboratory Accreditation Cooperation (ILAC). The signatories to these agreements recognise each other's accreditations.

The up-to-date state of membership can be retrieved from the following websites:
EA: www.european-accreditation.org
ILAC: www.ilac.org
IAF: www.iaf.nu

ВЯРНО С
ОРИГИНАЛА

Приложение 4.4

ДЕКЛАРАЦИЯ

че предложеното оборудване в процедурата отговаря на минималните технически изисквания на Възложителя

Аз, долуподписаният Стоил Колев Стоилов, в качеството ми на представляващ „Старт-Инженеринг“ АД, участник в открита процедура за възлагане на обществена поръчка с реф. № PPD18-103 и предмет: “Модернизация (ретрофит) на възлови разпределителни станции 20 (10) kV и изграждане на вериги на телемеханика“,

ДЕКЛАРИРАМ ЧЕ:

1. Предложеното от нас оборудване в процедурата за позиция „Триполюсен вакуумен прекъсвач, 12 kV/630 A/20 kA, за монтиране на закрито, фиксиран“ отговаря на минималните технически изисквания на Възложителя, посочени в таблица 4.

2. Доставяните от нас материали, апаратура, оборудване и съоръжения отговарят на посочените от възложителя в документацията за участие стандарти за изпълнение на поръчката.

3. Предложените от нас материали, апаратура, оборудване и съоръжения са с технически характеристики и показатели, които съответстват на техническите характеристики и показатели, посочени от възложителя за изпълнение на поръчката в документацията за участие.

Информиран съм, че Възложителят (включително чрез неговия помощен орган, а именно назначената за провеждане на поръчката оценителна комисия) ще обработва и съхранява личните ми данни, посочени в настоящата декларация, за целите на провеждане на обществената поръчка, като за целта ще предприеме всички необходими според действащата нормативна уредба мерки за защита на личните ми данни.

Дата 17.12.2018 г.

ПОДПИС и ПЕЧАТ:

На основание чл.36а ал.3 от ЗОП

Председател на Съвета на директорите
на „Старт-Инженеринг“ АД