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Draft Indian Standard

**High-voltage switchgear and controlgear – Part 202: AC prefabricated substations
for rated voltages above 1 kV and up to and including 52 kV
(First Revision)**

ICS 29.130.10

High Voltage Switchgear and Controlgear
Sectional Committee, ETD 08

Last date of receipt of comments:
26 October 2024

NATIONAL FOREWORD

This draft Indian Standard (First Revision) which is identical with IEC 62271-202:2022 “High-voltage switchgear and controlgear – Part 202: AC prefabricated substations for rated voltages above 1 kV and up to and including 52 kV” issued by the International Electrotechnical Commission (IEC) will be adopted by the Bureau of Indian Standards on the recommendation of the High Voltage Switchgear and Controlgear Sectional Committee and approval of the Electrotechnical Division Council.

This standard was first published in 2016 and was identical with IEC 62271-202: 2014. This revision has now been undertaken to align this standard with the latest international practices. This edition includes the following significant technical changes with respect to the previous edition:

- modification of the title and scope to include high-voltage switchgear prefabricated substations;
- in 7.2.101, the possible influence of surrounding elements on the dielectric performance of high-voltage components as high-voltage switchgear and controlgear and high-voltage interconnections non-metal-enclosed or without earthed screen are now considered;
- new informative Annex G with testing procedure to evaluate the impact of solar radiation in temperatures inside the enclosure and how to apply it;
- new informative Annex H for appropriate consideration of installation conditions of electronic equipment;
- the rated power of a prefabricated substation is now defined as a three-parameter rated value. See 5.101.1;
- minimum dimensions for access doors to the prefabricated substation in 6.104.4 and for free height of operation aisle in 6.105.3 have been introduced;
- continuous current (temperature rise) test methods have been revised/clarified where necessary; Figure D.1, which shows the mineral-oil-immersed power transformer load factor inside the enclosure, has been corrected.

The text of IEC Standard has been approved as suitable for publication as an Indian Standard without deviations. Certain terminologies and conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

- a) Wherever the words ‘International Standard’ appear referring to this standard, they should be read as ‘Indian Standard’.
- b) Comma (,) has been used as a decimal marker, while in Indian Standards the current practice is to use a point (.) as the decimal marker.

In this adopted standard, reference appears to International Standards for which Indian Standards also exists. The corresponding Indian Standards, which are to be substituted, are listed below along with their degree of equivalence for the editions indicated:

<i>International Standard</i>	<i>Corresponding Indian Standard</i>	<i>Degree of Equivalence</i>
IEC 60050-441, International Electrotechnical Vocabulary (IEV) – Part 441: Switchgear, controlgear and fuses (available at www.electropedia.org)	IS 1885 (Part 17): 1979/ IEC 60050-441: 1984 Electrotechnical vocabulary: Part 17 switchgear and control gear (<i>Second Revision</i>)	Identical with IEC 60050-441: 1984
IEC 60050-461:2008, International Electrotechnical Vocabulary (IEV) – Part 461: Electric Cables	IS 1885 (Part 32): 2019/ IEC 60050-461: 2008 Electrotechnical Vocabulary Part 32 Electric Cables (<i>Second Revision</i>)	Identical With IEC 60050-461:2008
IEC 60068-2-5:2018, Environmental testing – Part 2-5: Tests – Tests: Simulated solar radiation at ground level and guidance for solar radiation testing and weathering	IS/IEC 60068-2-5: 2018 Environmental Testing Part 2 Tests Section 5 Test S: Simulated solar radiation at ground level and guidance for solar radiation testing and weathering	Identical with IEC 60068-2-5:2018
IEC 60071-1:2019, Insulation co-ordination – Part 1: Definitions, principles and rules	IS/IEC 60071-1: 2019 Insulation co - Ordination: Part 1 definitions, principles and rules (<i>First Revision</i>)	Identical with IEC 60071-1:2019
IEC 60076-1:2011, Power transformers – Part 1: General	IS 2026 (Part 1): 2011 Power transformers: Part 1 general (<i>Second Revision</i>)	Technically Equivalent
IEC 60076-2:2011, Power transformers – Part 2: Temperature rise for liquid-immersed Transformers	IS 2026 (Part 2): 2010 Power transformers: Part 2 temperature - Rise (<i>First Revision</i>)	Technically Equivalent
IEC 60076-5:2006, Power transformers – Part 5: Ability to withstand short circuit	IS 2026 (Part 5): 2011 Power transformers: Part 5 ability to with stand short circuit (<i>First Revision</i>)	Technically Equivalent
IEC 60076-7:2018, Power transformers – Part 7: Loading guide for mineral-oil-immersed power Transformers	IS 2026 (Part 7): 2009/ IEC 60076-7: 2018 Power transformers: Part 7 loading guide for oil - Immersed power transformers	Identical with IEC 60076-7:2018

IEC 60076-10:2016, Power transformers – Part 10: Determination of sound levels	IS 2026 (Part 10): 2009 IEC 60076 -10: 2001 Power transformers: Part 10 determination of sound levels	Identical with IEC 60076-10:2001
IEC 60076-11:2018, Power transformers – Part 11: Dry-type transformers	IS 2026 (Part 11): 2021/ IEC 60076-11: 2018 Power Transformers Part 11 Dry-Type Transformers	Identical with IEC 60076-11:2018
IEC 60076-12:2008, Power transformers – Part 12: Loading guide for dry-type power Transformers	IS 2026 (Part 12): 2018/ IEC 60076-12: 2008 Power transformers: Part 12 loading guide for dry - Type power transformers	Identical with IEC 60076-12:2008
IEC 60529:1989, Degrees of protection provided by enclosures (IP Code) IEC 60529:1989/AMD1:1999 IEC 60529:1989/AMD2:2013	IS/IEC 60529: 2001 Degrees of protection provided by enclosures (IP Code)	Identical with IEC 60529:1989
IEC 60664-1:2020, Insulation coordination for equipment within low-voltage systems – Part 1: Principles, requirements and tests	IS 15382 (Part 1) : 2022/ IEC 60664-1:2020 Insulation Coordination for Equipment Within Low-Voltage Systems Part 1 Principles Requirements and Tests	Identical with IEC 60664-1:2020
IEC 60721-1:1990, Classification of environmental conditions – Part 1: Environmental parameters and their severities IEC 60721-1:1990/AMD1:1992 IEC 60721-1:1990/AMD2:1995	IS 13736 (Part 1) : 2018/ IEC 60721-1: 2002 Classification of environmental conditions: Part 1 environmental parameters and their severities (<i>First Revision</i>)	Identical with IEC 60721-1: 2002
IEC 60721-2-2:2012, Classification of environmental conditions – Part 2-2: Environmental conditions appearing in nature – Precipitation and wind	IS 13736 (Part 2/Sec 2) : 2018/ IEC 60721-2-2: 2012 Classification of environmental conditions: Part 2 environmental conditions appearing in nature: Sec 2 precipitation and wind (<i>First Revision</i>)	Identical with IEC 60721-2-2:2012
IEC 60721-2-4:2018, Classification of environmental conditions – Part 2-4: Environmental conditions appearing in nature – Solar radiation and temperature	IS/IEC 60721-2-4 : 2018/ IEC 60721-2-4:2018 Classification of Environmental Conditions Part 2 Environmental Conditions appearing in nature Section 4 Solar Radiation and Temperature	Identical with IEC 60721-2-4:2018
IEC 60721-3-4, Classification of environmental conditions – Part 3-4: Classification of groups of environmental parameters and their severities – Stationary use at non-weather protected locations	IS/IEC 60721-3-4 : 2019/ IEC 60721-3-4: 2019 Classification of Environmental Conditions Part 3 Classification of groups of environmental parameters and their severities Section 4 Stationary use at non- weather protected locations	Identical with IEC 60721-3-4: 2019
IEC TS 60815-1:2008, Selection and dimensioning of high-voltage insulators intended for	IS 16683 (Part 1) : 2018 IEC TS 60815-1 : 2008 Selection and dimensioning of high - Voltage	Identical with IEC TS 60815-1:2008

use in polluted conditions – Part 1: Definitions, information and general principles	insulators intended for use in polluted conditions: Part 1 definitions, information and general principles	
IEC 60947-1, Low-voltage switchgear and controlgear – Part 1: General rules	IS/IEC 60947-1 : 2020 Low-Voltage switchgear and controlgear Part 1 general rules	Identical with IEC 60947-1: 2020
IEC 61439 (all parts), Low-voltage switchgear and controlgear assemblies	IS/IEC 61439 (all parts), Low-voltage switchgear and controlgear assemblies	Identical
IEC 61439-1:2020, Low-voltage switchgear and controlgear assemblies – Part 1: General rules	IS/IEC 61439-1 : 2020 Low-voltage switchgear and controlgear assemblies Part 1: General rules (<i>First Revision</i>)	Identical with IEC 61439-1:2020
IEC 62262:2002, Degrees of protection provided by enclosures for electrical equipment against external mechanical impacts (IK code)	IS 17050 : 2023/ IEC 62262 : 2002 Degrees of protection provided by enclosures for electrical equipment against external mechanical impacts IK Code	Identical with IEC 62262:2002
IEC 62271-1:2017, High-voltage switchgear and controlgear – Part 1: Common specifications for alternating current switchgear and controlgear	IS/IEC 62271-1: 2017 High-Voltage switchgear and controlgear Part 1 common specifications for alternating current switchgear and controlgear	Identical with IEC 62271-1:2017
IEC 62271-200:2021, High-voltage switchgear and controlgear – Part 200: AC metal-enclosed switchgear and controlgear for rated voltages above 1 kV and up to and including 52 kV	IS/IEC 62271-200: 2021 High-voltage switchgear and Controlgear Part 200 AC metal-enclosed switchgear and Controlgear for rated voltages above 1 kV and up to and Including 52 kV	Identical with IEC 62271-200:2021
IEC 62271-201:2014, High-voltage switchgear and controlgear – Part 201: AC solid-insulation enclosed switchgear and controlgear for rated voltages above 1 kV and up to and including 52 kV	IS/IEC 62271-201 : 2014 High-Voltage Switchgear and Controlgear Part 201 ac Solid-Insulation Enclosed Switchgear and Controlgear for Rated Voltages Above 1 kV up to and Including 52 kV (<i>First Revision</i>)	Identical with IEC 62271-201:2014
ISO 1182:2010, Reaction to fire tests for products – Non-combustibility tests	IS 3808 : 1979 Method of test for non-combustibility of building materials (<i>First Revision</i>)	Technically Equivalent
ISO 1716:2018, Reaction to fire tests for products – Determination of the gross heat of combustion (calorific value)	IS/ISO 1716 : 2018 Reaction to Fire Tests for Products - Determination of The Gross Heat of Combustion Calorific Value	Identical with ISO 1716:2018
ISO 6508-1:2016, Metallic materials – Rockwell hardness test – Part 1: Test method	IS 1586 (Part 1) : 2018 Metallic materials - Rockwell hardness test: Part 1 test method (<i>Fifth Revision</i>)	Identical with ISO 6508-1:2016

The technical committee has reviewed the provisions of the following international standards referred in this adopted standard and decided that they are acceptable for use in conjunction with this standard.

<i>International Standard</i>	<i>Title</i>
IEC 62271-212:2016	High-voltage switchgear and controlgear – Part 212: Compact Equipment Assembly for Distribution Substation (CEADS)
IEC 61180-1:1992	High-voltage test techniques for low voltage equipment – Part 1: Definitions, test and procedure requirements
EN 10025-2:2019	Hot rolled products of structural steels – Part 2: Technical delivery conditions for non-alloy structural steels

Only the English language text has been retained while adopting it in this Indian Standard, and as such, the page numbers given here are not the same as in the IEC Publication.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated expressing the result of a test or analysis shall be rounded off in accordance with IS 2: 2022 ‘Rules for rounding of numerical values (*Second Revision*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Note: The technical content of the document is not available on website. For details, please refer the corresponding IEC 62271-202:2022 or kindly contact:

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