

TECHNICAL SPECIFICATION



**UHV AC transmission systems –
Part 201: UHV AC substation design**



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**UHV AC transmission systems –
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IEC TS 63042-201, which is a technical specification, has been prepared by IEC technical committee 122: UHV AC transmission systems.

The text of this Technical Specification is based on the following documents:

Enquiry draft	Report on voting
122/64/DTS	122/71A/RVDTS

Full information on the voting for the approval of this technical specification can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 63042 series, published under the general title *UHV AC transmission systems*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document will be

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UHV AC TRANSMISSION SYSTEMS –

Part 201: UHV AC substation design

1 Scope

This part of 63042, which is a Technical Specification, provides common rules for the design of substations with the highest voltages of AC transmission systems exceeding 800 kV, so as to provide safety and proper functioning for the intended use.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60038:2009, *IEC standard voltages*

IEC 60044 (all parts), *Instrument transformers*

IEC 60059:1999, *IEC standard current ratings*
IEC 60059:1999/AMD1:2009

IEC 60071-1:2006, *Insulation co-ordination – Part 1: Definitions, principles and rules*
IEC 60071-1:2006/AMD1:2010

IEC 60071-2, *Insulation co-ordination – Part 2: Application guide*

IEC 60076 (all parts), *Power transformers*

IEC 60068-3-3, *Environmental testing – Part 3: Guidance – Seismic test methods for equipments*

IEC 60137, *Insulated bushings for alternating voltages above 1000 V*

IEC 60168, *Tests on indoor and outdoor post insulators of ceramic material or glass for systems with nominal voltages greater than 1000 V*

IEC 60196:2009, *IEC standard frequencies*

IEC 60255-26, *Measuring relays and protection equipment – Part 26: Electromagnetic compatibility requirements*

IEC TS 60479-1, *Effects of current on human beings and livestock – Part 1: General aspects*

IEC 60721-2-4, *Classification of environmental conditions – Part 2-4: Environmental conditions appearing in nature – Solar radiation and temperature*

IEC TS 60815 (all parts), *Selection and dimensioning of high-voltage insulators intended for use in polluted conditions*

IEC 60865 (all parts), *Short-circuit currents*

IEC 60871 (all parts), *Shunt capacitors for a.c. power systems having a rated voltage above 1 000 V*

IEC 60909 (all parts), *Short-circuit currents in three-phase a.c. systems*

IEC TS 61463, *Bushings – Seismic qualification*

IEC 61850 (all parts), *Communication networks and systems for power utility automation*

IEC 61936-1:2010, *Power installations exceeding 1 kV a.c. – Part 1: Common rules*
IEC 61936-1:2010/AMD1:2014

IEC 62231, *Composite station post insulators for substations with AC voltages greater than 1 000 V up to 245 kV – Definitions, test methods and acceptance criteria*

IEC 62271-100, *High-voltage switchgear and controlgear – Part 100: Alternating current circuit-breakers*

IEC 62271-102, *High-voltage switchgear and controlgear – Part 102: Alternating current disconnectors and earthing switches*

IEC 62271-207, *High-voltage switchgear and controlgear – Part 207: Seismic qualification for gas-insulated switchgear assemblies for rated voltages above 52 kV*

IEC TR 62271-300, *High-voltage switchgear and controlgear – Part 300: Seismic qualification of alternating current circuit-breakers*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1

UHV AC

highest voltage of AC transmission system exceeding 800 kV

Note 1 to entry: UHV stands for "ultra high voltage".

3.2

high-voltage side of transformer

highest voltage among two or three voltages on each side of the main transformer

3.3

intermedium voltage side of transformer

second highest voltage among three voltages on each side of the main transformer

3.4

low-voltage side of transformer

lowest voltage among two or three voltages in the apparatus or installation

Note 1 to entry: In this document, the definition is modified as the lowest voltage among two or more voltages on each side of main transformer.