



Introduction to the relevant IEC/EN standards for control panel design

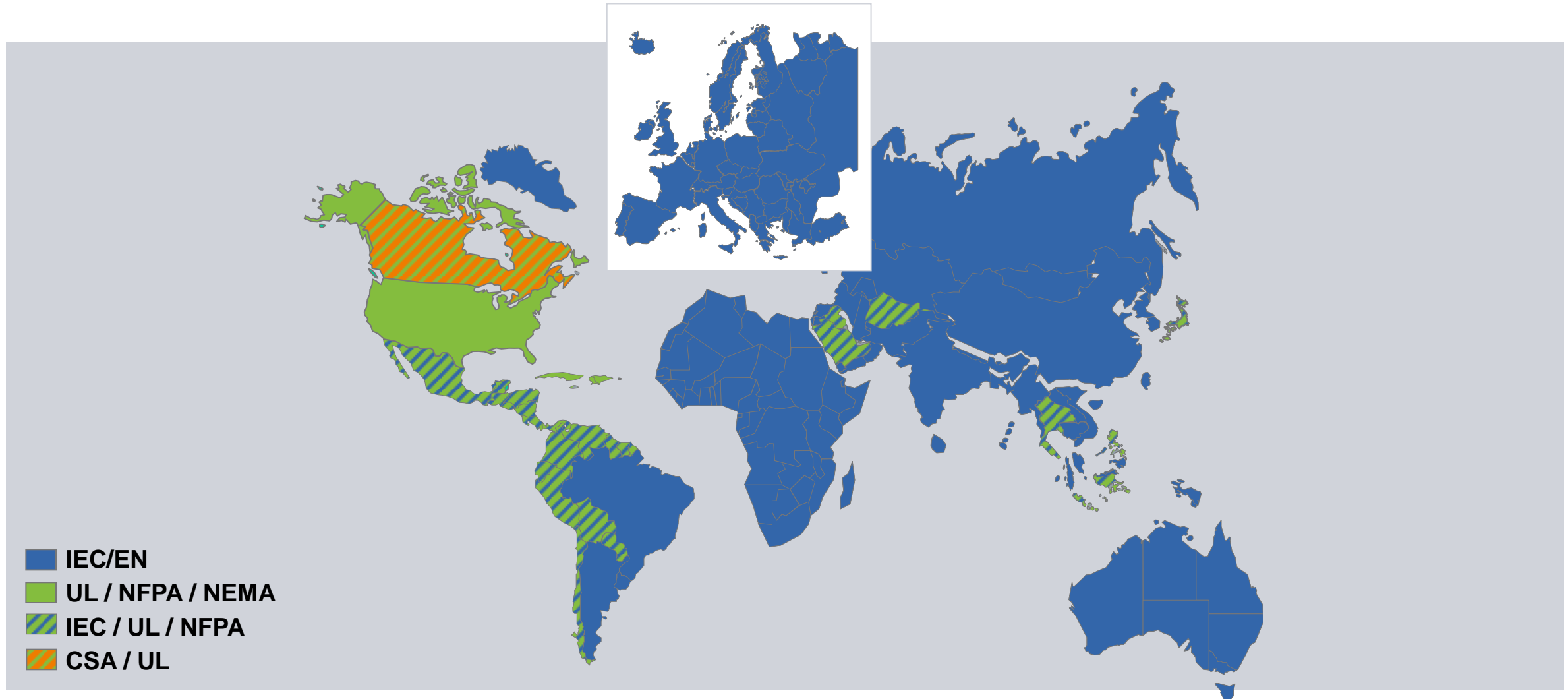
- Which standards are applicable and valid
- Scope of the new IEC 61439
“Low-voltage switchgear and control gear assemblies”
- Scope of the IEC 60204-1
“Electrical equipment of machines”



IEC and UL Markets at a Glance



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- IEC/EN
- UL / NFPA / NEMA
- IEC / UL / NFPA
- CSA / UL

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Adoption of IEC standards according to local requirements

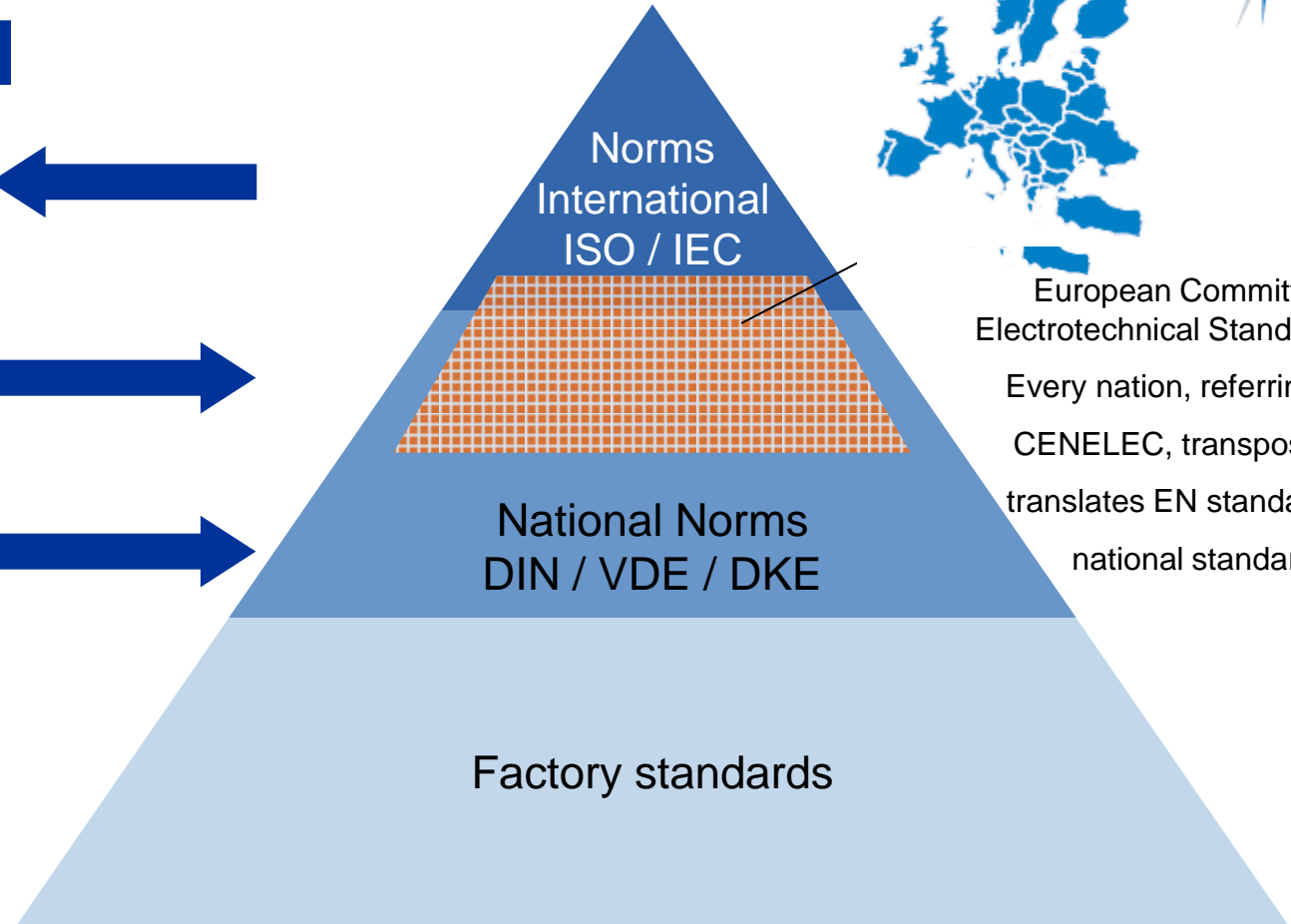
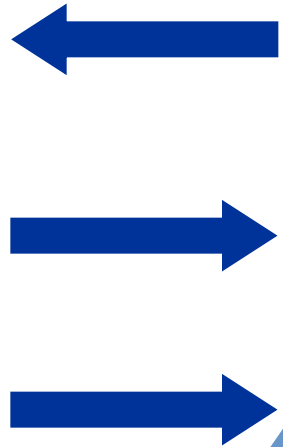
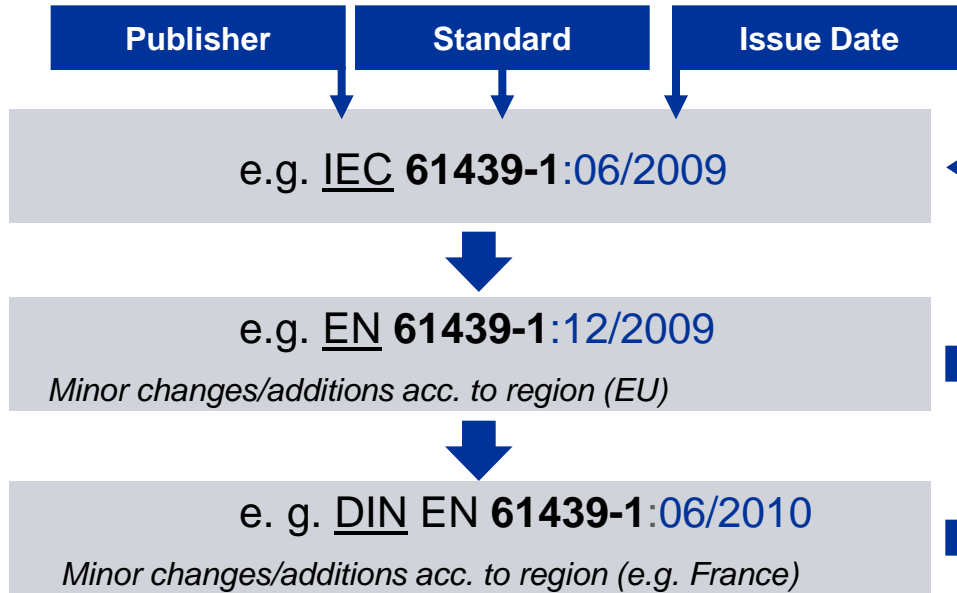
Explanation regarding use of prefixes



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Differences Between Europe & North America



Europe

- Responsibility of the manufacturer
- Responsibility of the operator
- Protection targets are defined by directives
- Presumption of conformity with the application of harmonized standards (ISO9000 et seqq., self-certification, self-responsibility)



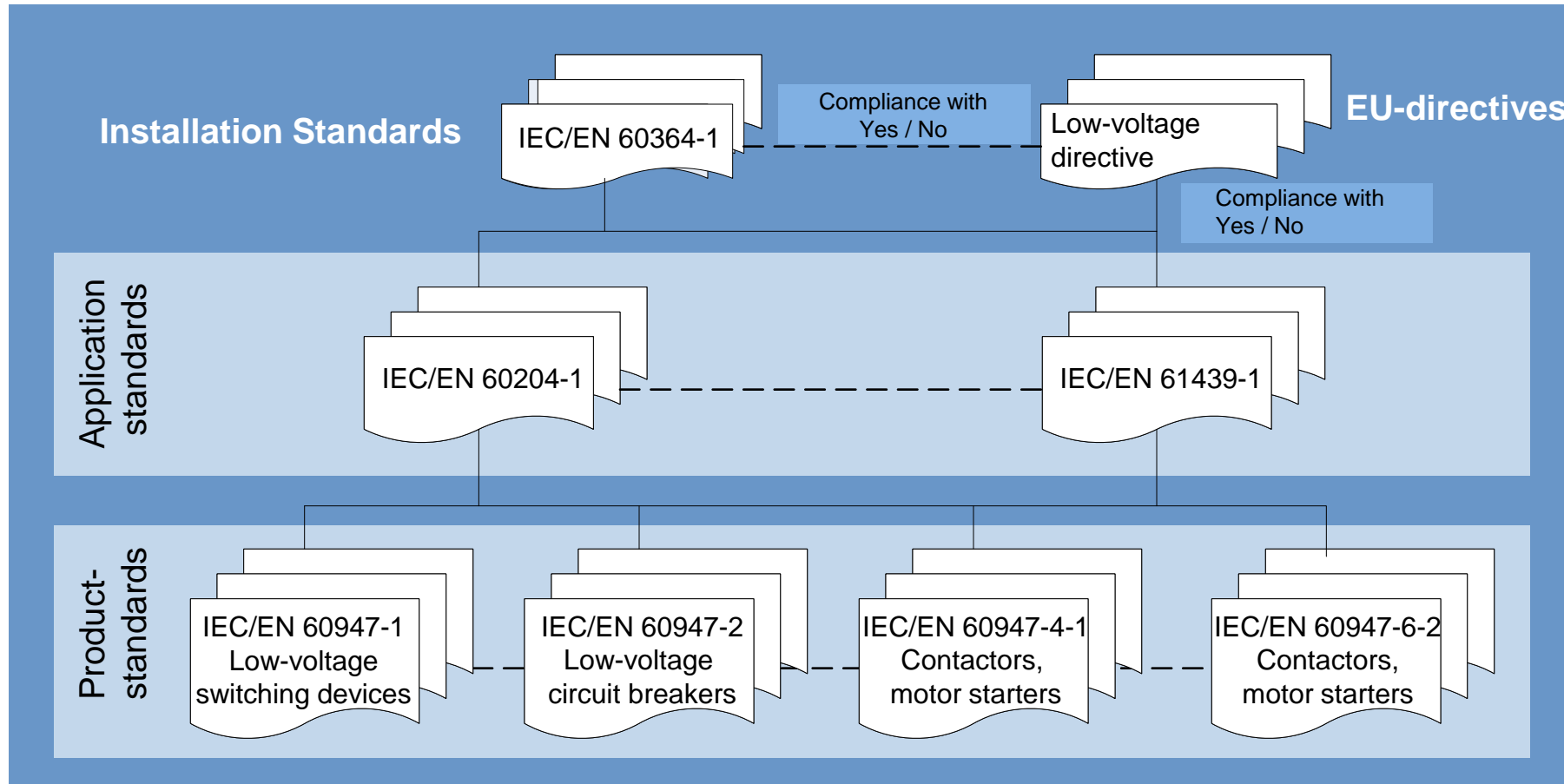
USA / North America

- Responsibility of the operator
- Protection targets and requirements are defined by laws
- Certification / listing of products
- Verification by independent NRTL/AHJ (third-party certification)



+ successful inspection by the Authority having Jurisdiction (AHJ)

Search Path within the Sets of Standards Example done with IEC/EN standards





Commission communication in the framework of the implementation of Directive 2006/95/EC of the European Parliament and of the Council of 12 December 2006 on the harmonisation of the laws of Member States relating to electrical equipment designed for use within certain voltage limits

(Text with EEA relevance)

(Publication of titles and references of harmonised standards under the directive)

(2012/C 245/01)

ESO ⁽¹⁾	Reference and title of the harmonised standard (and reference document)	Reference of superseded standard	Date of cessation of presumption of conformity of superseded standard Note 1
(1)	(2)	(3)	(4)
Cenelec	EN 60204-1:2006 Safety of machinery - Electrical equipment of machines - Part 1: General requirements IEC 60204-1:2005 (Modified)	EN 60204-1:1997 Note 2.1	Date expired (1.6.2009)
Cenelec	EN 61439-1:2009 Low-voltage switchgear and controlgear assemblies - Part 1: General rules IEC 61439-1:2009 (Modified)	EN 60439-1:1999 and its amendment Note 2.1	1.11.2014

IEC 60204-1 – Scope (Excerpt)

Standard for electrical equipment of machines



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- **Application** of electrical, electronic and programmable electronic equipment and systems **to machines not portable by hand while working**, including a group of machines working together in a co-ordinated manner.
- **Equipment** covered by this part of IEC 60204 **commences at the point of connection of the supply to the electrical equipment of the machine** (see 5.1).
- Note: The **requirements** for the electrical supply **installation in buildings** are given in **the IEC 60364** series.
- **Applicable** to equipment that operate with nominal supply voltages not exceeding **1000 V AC** and **1500 V DC** and with nominal supply frequencies **not exceeding 200 Hz**.
- Note: For higher voltages, see IEC 60204-11.

Note: The standard is aligned and more and more harmonized with the U.S. standard “NFPA79 Standard for Industrial Machinery”



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Industry Sector / I IA CE S V

Examples of Machines Covered by IEC/EN 60204-1 (Annex C)



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- Metalworking machinery
- Food machinery
- Plastics and rubber machinery
- Printing, paper and board machinery
- Folding machines
- Wood machinery
- Inspecting and testing machinery
- Assembly machines, compressors
- Conveyor technology, material handling
- Packaging machinery
- Shrink-wrapping machines
- Textile machines, laundry machines
- Refrigeration and air-conditioning machines
- Heating and ventilating machines
- Leather/imitation leather goods and footwear machinery
- Trimming and brushing machines
- Construction and building materials machinery
- Hoisting machinery (see IEC 60204-32)
- Transportable machinery
- Machinery for transportation of persons
- Mobile machinery
- Power-operated doors/gates
- Machines for hot metal processing
- Leisure machinery
- Tanning machinery
- Pumps, mining and quarrying machines
- Agriculture and forestry machines

IEC 61439 – Scope for Low-voltage switchgear and controlgear assemblies



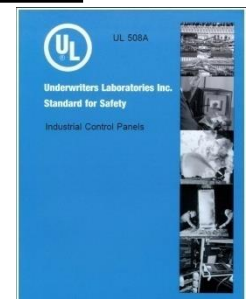
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Parts 1 & 2 apply to switchgear and controlgear assemblies:

- With a rated voltage of up to 1,000 V AC or 1,500 V DC
- Both fixed and movable, with or without enclosure
- For generating, transmitting, distributing, and converting electrical energy and controlling electrical switching devices and components
- To be used under special operating conditions (e.g. on ships, railcars) associated with additional requirements
- For **equipping machines** with the additional requirements [under IEC 60204](#)
- That are **individual units** or series-produced

The control panel may also be assembled by a different manufacturer to the original one

- The standard is intended to lay down definitions and set out the operating conditions, construction requirements, technical properties, and **verification requirements!**
- **partially** comparable with the U.S. standard “**UL508A standard for industrial control panels**”



Terminology

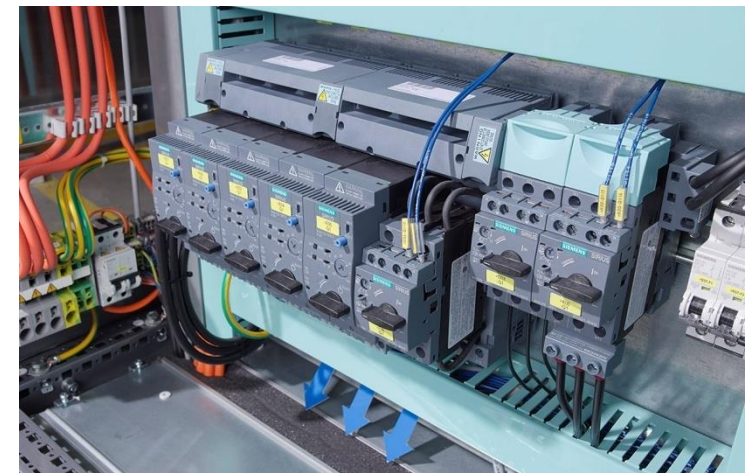
Low-voltage switchgear and controlgear assembly



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Low-voltage switchgear and controlgear assembly [e.g. industrial control panel]

- Assembly of **one or several low-voltage switchgears and controlgears** with related equipment for control, measurement, reporting, protection, and regulation, with all the internal electrical and mechanical connections and structural components



Any questions?

