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Railway applications – Rolling stock – Combined test method for traction systems

Applications ferroviaires – Matériel roulant – Méthode d'essais combinés pour systèmes de traction



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RAILWAY APPLICATIONS – ROLLING STOCK – COMBINED TEST METHOD FOR TRACTION SYSTEMS

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International Standard IEC 61377 has been prepared by IEC technical committee 9: Electrical equipment and systems for railways.

This edition cancels and replaces IEC 61377-1 (2006), IEC 61377-2 (2002) and IEC 61377-3 (2002). It constitutes a technical revision.

This edition includes the following main technical changes with regard to the previous editions: it includes updates as necessary in order to meet the current technical state of the art, to improve clarity and to create an edition that considers all types of motors part of a traction system.

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The text of this standard is based on the following documents:

FDIS	Report on voting
9/2078/FDIS	9/2113/RVD

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

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

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

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RAILWAY APPLICATIONS – ROLLING STOCK – COMBINED TEST METHOD FOR TRACTION SYSTEMS

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1 Scope

This International Standard applies to the traction system consisting (when it applies) of traction motor(s), converter(s), traction control equipment including software, transformer, input filters, brake resistors, main circuit-breaker, cooling equipment, transducers, contactors, etc.

Figure 1 is just an overview and is not representative of all traction system architectures.

Current collector, mechanical braking systems and gearbox are not in the scope of this standard.

Types of motors applicable in this standard are asynchronous, or synchronous including permanent magnet (PMM), or direct current (DC).

The auxiliary converter(s) is (are) part of the scope when the auxiliary converter is enclosed within the traction converter. Otherwise, when the traction system feeds an auxiliary system outside the traction converter, the auxiliary system can be replaced by an equivalent load.

NOTE 1 Energy storage system is not considered in this standard since there is no specific type test standard for energy storage system.

NOTE 2 Auxiliary loads validation is not part of this standard.

NOTE 3 The gearbox can be part of test set-up, but it is not a part of traction system.

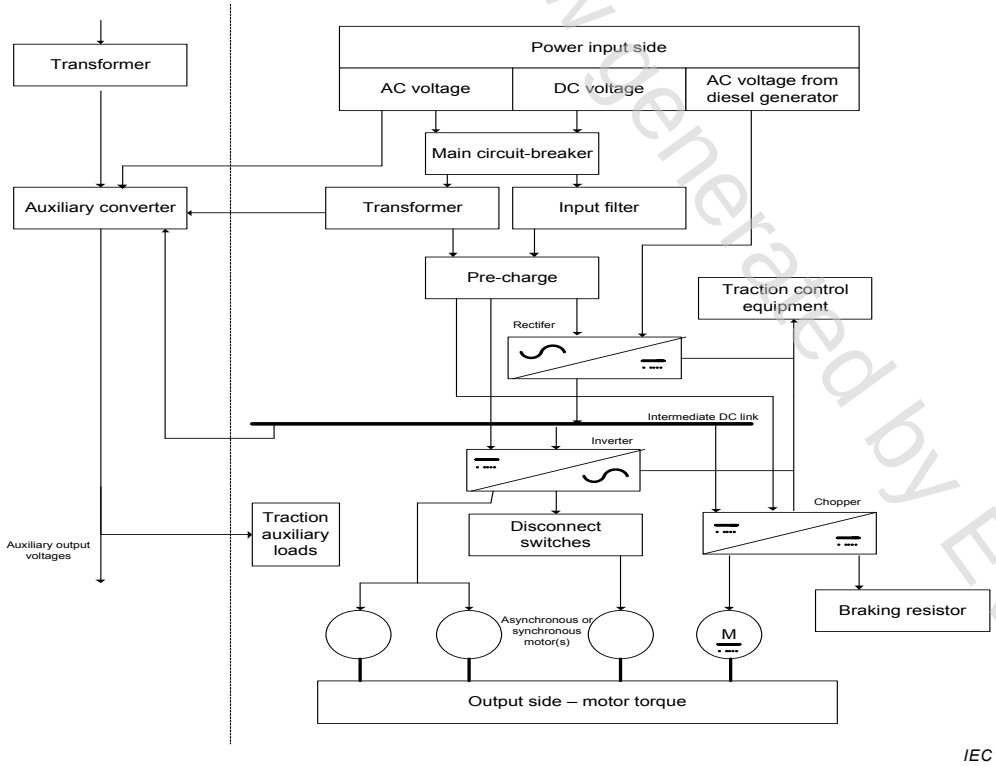


Figure 1 – Overview of traction system architecture

The objective of this standard is to specify the type test of a traction system, mainly comprising of:

– test of performance characteristics;
– test methods of verifying these performance characteristics.

This standard does not specify the type test of each individual component.

The traction system under test incorporates at least one complete traction conversion line (at least one traction converter and its related loads, one transformer in the case of AC supply or input filter in the case of DC supply). The representativeness of the traction system under test versus the actual traction system is agreed between the user and manufacturer.

Figure 2 gives one example of the relationship between the traction system under test and the whole traction system.

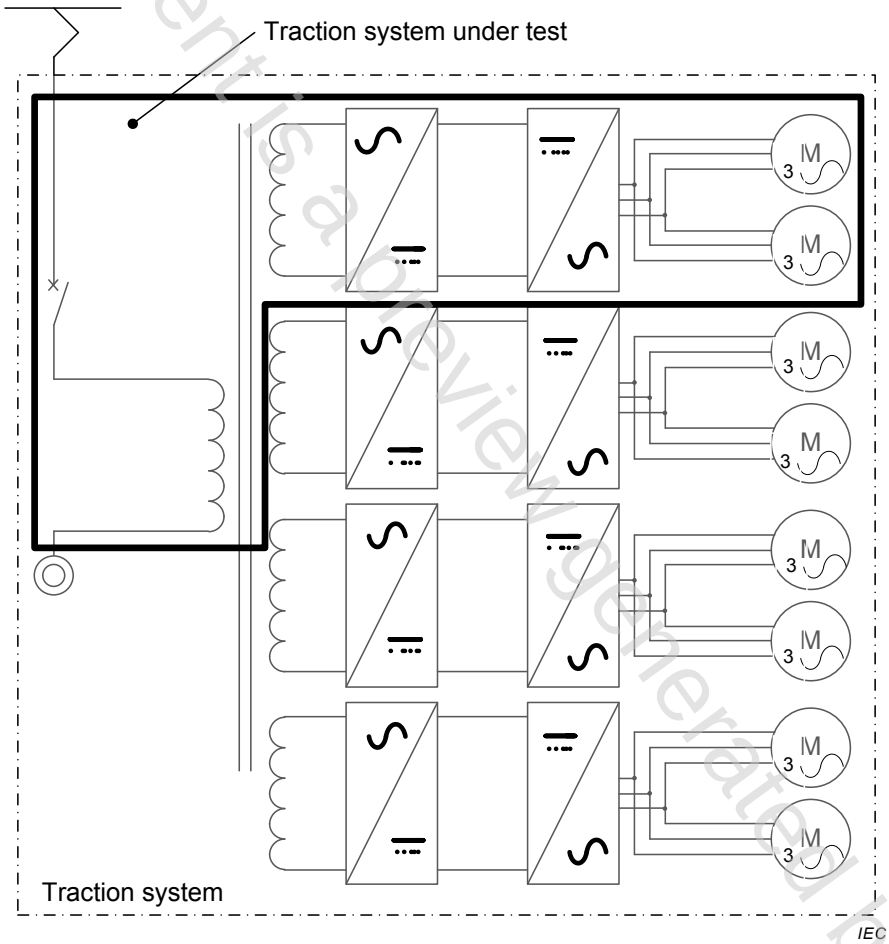


Figure 2 – Example of relationship between the “traction system under test” and the “traction system”

The traction system under test is equipped with components that are representative of the production series.

Deviations may be permitted by agreement between user and manufacturer, and are justified from an impact stand point in advance of the test. Using equivalent components or parts is permitted if no significant influence on the test result is expected.

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2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60050 (all parts): *International Electrotechnical Vocabulary* (available at http://www.electropedia.org)

IEC 60349-1, *Electric traction – Rotating electrical machines for rail and road vehicles – Part 1: Machines other than electronic converter-fed alternating current motors*

IEC 60349-2, *Electric traction – Rotating electrical machines for rail and road vehicles – Part 2: Electronic converter-fed alternating current motors*

IEC TS 60349-3, *Electric traction – Rotating electrical machines for rail and road vehicles – Part 3: Determination of the total losses of converter-fed alternating current motors by summation of the component losses*

IEC 60349-4, *Electric traction – Rotating electrical machines for rail and road vehicles – Part 4: Permanent magnet synchronous electrical machines connected to an electronic converter*

IEC 60850, *Railway applications – Supply voltages of traction systems*

IEC 61133, *Railway applications – Rolling stock – Testing of rolling stock on completion of construction and before entry into service*

IEC 61287-1, *Railway applications – Power converters installed on board rolling stock – Part 1: Characteristics and test methods*

IEC 62313, *Railway applications – Power supply and rolling stock – Technical criteria for the coordination between power supply (substation) and rolling stock*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-411, IEC 60050-551, IEC 60050-811, and the following apply:

3.1
traction system
system which provides traction torque, converting the input supply energy into mechanical energy in motoring and the mechanical energy into electrical or thermal energy in braking (if applicable), comprising of the entire conversion equipment located between the current collector (excluded) and the motor shaft(s) and including all associated auxiliary equipment needed to operate the system

3.2
traction system under test
representative traction system for combined test, according to Clause 1

3.3
component
constituent of traction system

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