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IEEE Standard for Electrical and Electronic Control Apparatus on Rail Vehicles

IEEE Vehicular Technology Society

Developed by the
Rail Transportation Standards Committee

IEEE Std 16™-2020
(Revision of IEEE Std 16-2004)

IEEE

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Rail Transportation Standards Committee
of the
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IEEE SA Standards Board

Abstract: A set of uniform design, application, and test requirements for electrical and electronic control apparatus on rail vehicles is provided in this standard.

Keywords: apparatus, control, design, electrical, electro-hydraulic, electronic, electropneumatic, IEEE 16™, rail, routine test, test, transit, transportation, type test

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At the time this IEEE standard was completed, the Passenger Rail Vehicle Working Group had the following membership:

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Introduction

This introduction is not part of IEEE Std 16-2020, IEEE Standard for Electrical and Electronic Control Apparatus on Rail Vehicles.

This standard is intended to apply to rail vehicles that are electrically powered. These vehicles include locomotives, railway electric multiple unit (EMU) cars, heavy rail vehicles, and light rail vehicles, including units that combine powered and unpowered trucks or axles. Fully-automated, driverless implementations of the above vehicle types are sometimes included in the mode of transit referred to as Automated Guideway Transit, also referred to as Automated People Mover, and, to the extent that the vehicle does not have other unique requirements, this standard can be applied. It is not intended that this standard be universally required for all such systems.

The classes of railway vehicles (such as those termed "Diesel Multiple Unit" [DMU]) that use a non-electric propulsion system have features of the electrical systems used in these vehicles that are similar to those used in "conventional" electrically-powered vehicles. To the extent that these systems are similar to those used in electrically powered vehicles, this standard can be applied.

NOTE—Self-propelled railway vehicles operating on trackage of the general railroad system are subject to regulations issued by governmental bodies (e.g., federal, state, and local bodies). In selected jurisdictions, this is also true for rail transit vehicles. The user of this standard should recognize that such regulations always take precedence over a consensus standard.[1]

Certain heavy-duty rubber tired vehicles, notably dual-mode, hybrid, and electric trolley buses and large off-highway haulage trucks, utilize electric propulsion systems. Again, to the extent that these systems are similar to those used in rail vehicles, this standard can be applied.

It should be noted that this standard makes extensive use of the phrase, "as agreed to between the supplier and the authority having jurisdiction", as well as requiring that the "authority having jurisdiction" provide certain significant parameters and/or make important determinations relevant to a specific project and not necessarily able to be anticipated in advance. Annex B lists all such citations within the standard and categorizes them as guidance for users of this standard.

[1]Notes in text, tables, and figures of a standard are given for information only and do not contain requirements needed to implement this standard.

Contents

IEEE Standard for Electrical and Electronic Control Apparatus on Rail Vehicles

1. Overview

1.1 Scope

This standard prescribes design, application, and test requirements for electrical and electronic control apparatus on rail vehicles.

NOTE—This standard covers neither rotating equipment nor the functional aspects of converters.

1.2 Purpose

This standard is intended to provide a set of uniform design, application, and test requirements for electrical and electronic control apparatus on rail vehicles. These requirements are the minimum necessary for suitability for use in a rail vehicle environment. Use of this standard should lead to enhanced levels of safety and reliability, and lower acquisition and maintenance costs.

1.3 Application

This standard is intended to be applied to the equipment designed for and installed on a rail vehicle. Application of this standard to the completed rail vehicle is beyond the scope and purpose of this standard.

NOTE—The selective application of this standard to the complete rail vehicle, as deemed technically correct and contractually agreed between the authority having jurisdiction and the car supplier, is recognized as appropriate in certain areas and cases.

1.4 Word usage

The word *shall* indicates mandatory requirements strictly to be followed in order to conform to the standard and from which no deviation is permitted (shall equals is required to).[2,3]

[2]The use of the word *must* is deprecated and cannot be used when stating mandatory requirements, *must* is used only to describe unavoidable situations.

[3]The use of *will* is deprecated and cannot be used when stating mandatory requirements, *will* is only used in statements of fact.