IEC 61800-2

Edition 2.0 2015-07

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Adjustable speed electrical power drive systems – Part 2: General requirements – Rating specifications for low voltage adjustable speed a.c. power drive systems

Entraînements électriques de puissance à vitesse variable – Partie 2: Exigences générales – Spécifications de dimensionnement pour systèmes d'entraînement de puissance à vitesse variable en courant alternatif et basse tension

IEC 61800-2:2015-07(en-fr)

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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ADJUSTABLE SPEED ELECTRICAL POWER DRIVE SYSTEMS –

Part 2: General requirements – Rating specifications for low voltage adjustable speed a.c. power drive systems

FOREWORD

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International Standard IEC 61800-2 has been prepared by subcommittee 22G: Adjustable speed electric drive systems incorporating semiconductor power converters, of IEC technical committee 22: Power electronic systems and equipment.

This second edition cancels and replaces the first edition published in 1998. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition.

a) Clause 1 (Scope) has been updated
b) Clause 2 (Normative references) has been updated

c) Clause 3 (Definitions) has been updated including fundamental definitions to be used across the IEC 61800 series of standards.

d) Clause 4 has been updated with respect to:

   1) description of the basic topology for *BDM/CDM/PDS* (4.2);

   2) ratings and performance (4.3 and 4.4);

   3) reference to applicable standards within the IEC 61800 series with respect to EMC (IEC 61800-3), Electrical safety (IEC 61800-5-1), Functional safety (IEC 61800-5-2), Load duty aspects (IEC TR 61800-6), Communication profiles (IEC 61800-7 series) and *Power interface* voltage (IEC TS 61800-8) to avoid conflicting requirements. (4.5, 4.6, 4.7, 4.10, 4.11, 4.12,);

   4) update of requirement for ECO design (4.8);

   5) update of requirement for environmental evaluation. (4.9);

   6) implementation of requirement for explosive atmosphere (4.13).

e) Clause 5 has been updated with test requirement in order to provide a clear link between design requirement and test requirement.

f) Clause 6 has been updated to harmonize the marking and documentation requirement within the IEC 61800 series.

g) Existing Annexes A to G have been deleted and replaced with new Annexes A to C.

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

FDIS	Report on voting
22G/303/FDIS	22G/305/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.

A list of all parts in the IEC 61800 series, published under the general title *Adjustable speed electrical power drive systems*, can be found on the IEC website.

In this standard, the terms in *italics* are defined in Clause 3.

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

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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INTRODUCTION

0.1 General

This document is part of the IEC 61800 series specifying requirements for adjustable speed electric drive systems (*PDS*). Since the publication of the first edition of IEC 61800-2 several documents of the IEC 61800 have been developed and maintained, which has resulted in outdated references and conflicting requirements across the IEC 61800 series.

This document contains general requirements for *PDS*s intended to feed a.c. *motors* and with rated *converter* input voltages (line-to-line voltage) up to 1 000 V a.c.

*PDS*s intended to feed a.c. *motors* with rated *converter input* voltages above 1 000 V a.c. are covered by IEC 61800-4.

*PDS*s intended to feed d.c. *motors* are covered by IEC 61800-1.

0.2 Consistency of requirement

This document specifies requirements for *PDS*s under its scope for the identified topics not covered by any other of the standards in the IEC 61800 series.

The following requirements are covered by other standards in the IEC 61800 series:

- EMC requirements are covered in IEC 61800-3;
- electrical safety requirements are covered in IEC 61800-5-1;
- functional safety requirements are covered in IEC 61800-5-2;
- type of load duty requirements are covered by IEC TR 61800-6;
- communication profiles aspects which are covered by IEC 61800-7 series;
- *power interface* voltage specification is specified in IEC TS 61800-8.

Generally this document provides a basic description of topics and refers to the relevant standard for specific requirement. This is done in order to ensure consistency and avoid conflicting requirement within the IEC 61800 series as well as minimize future maintenance of the documents.

As part of the work inside SC22G MT9 this edition of IEC61800-2 defines basic definition as used across the IEC 61800 series of standards.

For issues related to *active infeed converters,* IEC TS 62578 has been considered.

At the time of writing IEC SC 22G is developing a standard to provide requirement for energy *efficiency* for *BDM*/*CDM*/*PDS*. The next edition of IEC 61800-2 will reference this standard similar to the approach taken with the other IEC 61800 series standards.

As a result of the development of the IEC 61800 series of standards the need to reference documents outside the series has decreased and especially the need to reference the IEC 60146 series of standards has decreased dramatically.

0.3 Tool for agreement between *customer* and *manufacturer*

This document is intended to be used to create a comprehensive list of requirements to be used as a specification between *customer* and *manufacturer*. The requirement in this document is in itself not applicable for the *BDM/CDM/PDS*. Instead each topic should be specified by the *customer* as a compliance requirement.

The document may be useful as a specification tool, when *BDM/CDM/PDS*s are built into a final *installation* or application applied as a component. The following applications are considered relevant: lift and hoist, machinery, conveyor, switchgears, heating and ventilation, pump, wind, tidal and marine propulsion applications.

In every application, an identification of the environmental conditions under which the product is stored, transported and operated is essential for the proper specification of the *BDM/CDM/PDS*s. The environmental conditions considered should include electrical, mechanical, thermal, pollution and humidity environmental condition.

ADJUSTABLE SPEED ELECTRICAL POWER DRIVE SYSTEMS –

Part 2: General requirements – Rating specifications for low voltage adjustable speed a.c. power drive systems

1 Scope

This part of IEC 61800 applies to adjustable speed electric a.c. power drive systems, which include semiconductor power conversion and the means for their control, protection, monitoring, measurement and the a.c. *motor*s.

It applies to adjustable speed electric power drive systems intended to feed a.c. *motors* from a *BDM* connected to line-to-line voltages up to and including 1 kV a.c. 50 Hz or 60 Hz and/or voltages up to and including 1,5 kV d.c. input side.

NOTE 1 Adjustable speed electric a.c. power drive systems intended to feed a.c. motors, and with rated *converter* input voltages above 1 000 V a.c. are covered by IEC 61800-4.

NOTE 2 Adjustable speed electric d.c. power drive systems intended to feed d.c. *motors* are covered by IEC 61800-1.

NOTE 3 For adjustable speed electric a.c. power drive systems having series-connected electronic power *converter* sections, the line-to-line voltage is the sum of the series connected input voltages.

Traction applications and electric vehicles are excluded from the scope of this standard.

This part of IEC 61800 is intended to define the following aspects of an a.c. power drive system (*PDS*):

- principal parts of the *PDS*;
- ratings and performance;
- specifications for the environment in which the *PDS* is intended to be installed and operated;
- other specifications which might be applicable when specifying a complete *PDS*.

This standard provides minimum requirements, which may be used for the development of a specification between *customer* and *manufacturer*.

Compliance with this standard is possible only when each topic of this standard is individually specified by the *customer* developing specifications or by product standard committees developing product standards.

For some aspects which are covered by specific *PDS* product standards in the IEC 61800 series, this document provides a short introduction and reference to detailed requirements in these product standards.