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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 12668.6-2011

Replacing GB/T 3886.1-2001

**Adjustable speed electrical power drive systems -- Part 6:
Guide for determination of types of load duty and
corresponding current ratings**

调速电气传动系统 第6部分：确定负载工作制类型和相应电流额定值的导则
(English Translation)

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Foreword

GB/T 12688 "Speed Control Electric Drive System" is divided into the following parts.

---Part 1. The specification of the rated value of the low-voltage DC-regulated electric drive system;

--- Part 2. The specification of the rated value of the low-voltage AC variable frequency electric drive system;

--- Part 3. Electromagnetic compatibility requirements and their specific test methods;

---Part 4. The regulation of the rated value of AC speed control electric drive system with AC voltage above 1000V but not exceeding 35kV;

--- Part 5. Safety requirements;

--- Part 6. Guidelines for determining the type of load duty and the corresponding current rating;

--- Part 7. General specifications and specifications for the use of electric drive systems;

--- Part 8. Specification of electrical interface voltage.

This part is the sixth part of GB/T 12688.

This part is drafted in accordance with the rules given in GB/T 1.1-2009.

The main technical changes in this section compared with GB/T 3886.1-2001 are as follows.

- Added the terminology and definition of "intermittent load working system with no-load period" (see 2.1.6);
- Removed "semiconductor converter device", "classification of semiconductor converter", "non-inverter", "one-quadrant converter", "single change" Current device", "semiconductor converter group", "converter transformer", "common converter transformer", "rated DC current", "rated DC" Terms and definitions of "pressure" and "rated AC voltage" (2.1~2.2, 2.4~2.6, 2.8~2.10 of GB/T 3886.1-2001, 2.12~2.14);
- Removed the conditions of use (3.8 of GB/T 3886.1-2001);
- Removed the test of the thyristor device (Chapter 5 of GB/T 3886.1-2001);
- Removed Appendix A and Appendix B.

This part uses the translation method equivalent to IEC/T R61800-6.2003 "Speed Control Electric Drive System Part 6. Determining Load Work Guidelines for Types and Corresponding Current Ratings.

The documents of our country that have a consistent correspondence in the normatively cited international documents in this section are as follows.

- GB/T 3859.1-1993 Specification for basic requirements for semiconductor converters (equivIEC 60146-1-1.1991);
- GB/T 12668.1-2002 Speed control electric drive systems - Part 1. General requirements Regulation of the rating (IEC 61800-1:1997, IDT);
- GB/T 12668.2-2002 Speed control electric drive systems - Part 2. General requirements Regulation of the rating (IEC 61800-2:1998, IDT).

This section makes the following editorial changes.

- The decimal point symbol replaces "," with ".";
- Remove the preface to the international standard.

This part replaces GB/T 3886.1-2001 "General Requirements for Semiconductor Power Converters for Speed Control Electric Drive Systems Part 1. Provisions for the rating of DC motor drives.

This part was proposed by China Electrical Equipment Industry Association.

This part is under the jurisdiction of the National Power Electronics Standardization Technical Committee (SAC/TC60).

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1.1 Scope and purpose

This section provides an alternative to the rating of the variable speed electric drive system (PDS), especially its basic drive module (BDM).

Methods.

This section does not cover the speed control drive for traction.

General guidelines for specifying the rated value of low-voltage DC-regulated electric drive systems and the ratings of low-voltage AC variable-frequency electric drive systems the general guidelines have been given in IEC 61800-1 and IEC 61800-2, respectively.

1.2 Normative references

The following documents are indispensable for the application of this document. For dated references, only dated versions apply to this article.

Pieces. For undated references, the latest edition (including all amendments) applies to this document.

IEC 60146-1-1 General requirements for semiconductor converters and power transformers - Part 1-1. Specification

(Semiconductorconvertors-Generalrequirementsandlinecommutatedconvertors-Part 1-1.Specifi-Cationsofbasicrequirements) IEC 61800-1 speed control electric drive systems - Part 1. General requirements Adjustable speed electrical power drive systems-Part 1: General requirements-Ratings specifica-Tions for low voltage adjustable speed d.c. power drive systems) IEC 61800-2 speed control electric drive systems - Part 2. General requirements Adjustable speed electrical power drive systems-Part 2: General requirements-Ratings specifica-Tions for low voltage adjustable frequency a.c. power drive systems)

2.1 Terms and definitions

The following terms and definitions as defined by IEC 61800-1, IEC 61800-2 and IEC 60146-1-1 apply to this document.

2.1.1

Equilibrium temperature the steady state temperature reached by the converter components under specified load and cooling conditions.

Note: In general, the steady-state temperatures of different components vary, and the time required to establish a steady state is also different and proportional to its thermal time constant.

2.1.2

Load current-time graph **current-time load chart** Recording curve of load current versus time.

2.1.3

Balanced load working system **uniform load duty** this type of load working system is that the time interval between the variable current devices carrying a certain fixed current value is long enough for the components of the converter to reach the current value corresponds to an equilibrium temperature. Figure 1 is a graphical illustration of this type of load operation (see Table 1 for symbols).

Figure 1 Typical current-time graph of balanced load operation

2.1.4

Intermittent peak load working system **intermittent peak load duty** this type of load duty is to apply a high amplitude and short duration load immediately after the no-load period, and then successively apply the load.

A thermal balance is reached between. Figure 2 is a graphical illustration of this type of load operation. Intermittent loads do not need to be equally spaced, but manufacturers should the shortest no-load period t_0 required for the semiconductor to reach the no-load temperature before the next load is applied.

Figure 2 Typical current-time graph of intermittent peak load operation

2.1.5

Intermittent load duty this type of load operation is to superimpose intermittent loads on a constant base load between successive intermittent loads.

Achieve thermal balance. Figure 3 is a graphical illustration of such a load operation. Intermittent loads need not be equally spaced, but the manufacturer should specify the application the minimum t_b required for the semiconductor to reach a steady state temperature before an intermittent load.