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

GB/T 13539.5-2020

Replacing GB/T 13539.5-2013

**Low-voltage fuses - Part 5: Guidance for the application of
low-voltage fuses**

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Foreword

GB/T 13539 "Low Voltage Fuse" consists of the following parts:

---Part 1: Basic requirements;

---Part 2: Supplementary requirements for fuses used by full-time personnel (mainly used in industrial fuses) standardized fuse system

Examples A to K;

---Part 3: Supplementary requirements for fuses used by unskilled personnel (mainly used

for household and similar purposes) standardization

Examples of fuse systems A to F;

---Part 4: Supplementary requirements for fuse-links for the protection of semiconductor equipment;

---Part 5: Application guide for low-voltage fuses;

---Part 6: Supplementary requirements for fuse-links for the protection of solar photovoltaic systems:

This part is Part 5 of GB/T 13539:

This section was drafted in accordance with the rules given in GB/T 1:1-2009:

This part replaces GB/T 13539:5-2013 "Low-Voltage Fuses Part 5: Application Guide for Low-Voltage Fuses", and

Compared with GB/T 13539:5-2013, the main technical changes are as follows:

---Added new definitions "single breakpoint" and "double breakpoint", as well as the symbols of combination appliances with these two forms (see 3:4:1,

3:5:1, Chapter 6);

---Added the two advantages of "high level of energy efficiency" and "excellent personnel and equipment protection to prevent arc flash" (see Chapter 4);

---Added 5:3:4 "Fuse link pre-arc time-current characteristics" (see 5:3:4);

---Added 5:3:5 "fuse action at altitudes higher than:2000m" (see 5:3:5);

---The maximum working voltage value of the AC fuse link at the rated voltage of 1000V has been increased (see Table 4);

--- Added Table 5 "Typical Working Voltage Ratings of DC Fuse Links" (see Chapter 7);

---Added the use categories gU, gK and gPV and the corresponding wire protection selection method, and introduced in the gG fuse selection method

Enter the formula " $I_t \leq 1.45 I_Z$ " and Figure 6 "Current used for fuse link selection" (see Chapter 8);

---Added the power factor compensation with a rated voltage of 1kV in Table 6 "Selection of Fuse for Power Factor Compensation Capacitor Protection"

Capacitor selection parameters for 1500V fuse (see Chapter 11);

---Increase the limit requirement for the intersection current I_{co} in the selection method of the fuse link for motor circuit protection, that is, lower than the contactor and overload

The electric withstand current of the relay contacts (see 13:4);

---Added supplementary information for part of the range of fuse-links and full range of fuse-links used to protect semiconductor equipment, including the protection of rectifiers

The introduction of protective aR fuse, the action requirements of gR and gS fuse, and the addition of fuse for DC circuit semiconductor equipment

The selection method (Chapter 15);

---Added an overview of DC power supplies in DC applications (see 17:1);

--- Added Chapter 19 "Photovoltaic (PV) System Protection" (see Chapter 19);

--- Added Chapter 20 "Wind Power System Protection" (see Chapter 20):

The translation method used in this part is equivalent to the IEC /T R60269-5:2014

``Low-Voltage Fuse Part 5: Application Guidelines for Low-Voltage Fuse

south":

The Chinese documents that have a consistent correspondence with the international documents cited in this section are as follows:

---GB/T 2900 (all parts) Electrical terminology [IEC 60050 (all parts)]

---GB/T 13539:1-2015 Low-voltage fuses Part 1: Basic requirements (IEC 60269-1:2009, IDT)

---GB/T 13539:2-2015 Low-voltage fuses Part 2: Supplementary requirements for fuses used by full-time personnel (mainly used

Industrial fuse) Examples of standardized fuse systems A to K (IEC 60269-2:2013, IDT);

---GB/T 13539:3-2017 Low-voltage fuses Part 3: Supplementary requirements for fuses used by unskilled personnel (mainly

(Fuses for household and similar purposes) Examples of standardized fuse systems A to F (IEC 60269-3:2013, IDT);

---GB/T 13539:4-2016 Low-voltage fuses Part 4: Supplementary requirements for fuse-links for the protection of semiconductor equipment (IEC

60269-4:2012, IDT);

---GB/T 13539:6-2013 Low-voltage fuses Part 6: Supplementary requirements for fuse-links for solar photovoltaic system protection

(IEC 60269-6:2010, IDT);

---GB/T 14048:3-2017 Low-voltage switchgear and control equipment Part 3: Switches, isolators, disconnectors and fuses

Combination appliance (IEC 60947-3:2015, IDT);

---GB/T 14048:4-2010 Low-voltage switchgear and control equipment Part 4-1: Contactors and motor starters

Electric contactors and motor starters (including motor protectors) (IEC 60947-4-1:2009, MOD);

---GB/T 16895:6-2014 Low-voltage electrical installations Part 5-52: Selection of electrical equipment and installation of wiring systems

(IEC 60364-5-52:2009, IDT);

---GB/T 17950-2000 Semiconductor converter Part 6: Use a fuse to protect the semiconductor converter from overcurrent

Application Guidelines (IEC /T R60146-6:1992, IDT):

This section has made the following editorial changes:

---Add a note in 5:3:4 to facilitate the understanding of the standard;

---Change I_2 in 8:2 and Figure 6 to I_t , and "1:15IZ" at the right arrow in Figure 6 "Current for fuse link selection" to

"1:45IZ", add a note explaining "For fuses, the agreed tripping current is called the agreed fusing current":

This part was proposed by China Electrical Equipment Industry Association:

This part is under the jurisdiction of the National Fuse Standardization Technical Committee (SAC/TC340):

Drafting organizations of this section: Shanghai Electrical Apparatus Research Institute, Hollyland (Xiamen) Circuit Protection Technology Co., Ltd., Xi'an Zhongrong Electric Co., Ltd:

Co., Ltd., Zhejiang Chint Electric Co., Ltd., Wenzhou Sanshi Electric Co., Ltd:

Introduction

Fuses protect all types of equipment and switchgear from overcurrent: Overcurrent may cause the following hazards:

--- Thermal damage to wires or bus bars;

---Metal vaporization;

---Gas ionization;

---Arc, fire, explosion;

---Insulation damage: