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Replacing GB 14048.2-2001

Low-voltage switchgear and controlgear – Part 2: Circuit-breakers

(IEC 60947-2:2006, IDT)

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Foreword

This Part belongs to the standard with compulsory provisions. 7.1.3, 7.1.4, 7.2.1, 7.2.3, 7.3, 8.3.3.2, 8.3.3.8, 8.3.5, 8.4, Appendix B, Appendix F, Appendix J and Appendix N are mandatory; the rest are recommended. For the electronic control device of the circuit breaker with electronic overcurrent protection, EMC test is of great importance; the product from the manufacturer of electronic control device must perform the EMC test; if the circuit breaker manufacturer has selected the electronic products that have been performed the EMC test, and the test report is attached, then such test is not necessary to be repeated.

This Part belongs to Part 2 of *Low-Voltage Switchgear and Controlgear*; it is the product standard; it includes the basic requirements and test methods of circuit breaker. The general requirements for circuit breaker can refer to the provisions of Part 1, such as vocabulary of terms, test circuit, methods. This Part must be used in conjunction with Part 1. *Low-Voltage Switchgear and Controlgear* includes:

- GB 14048.1 Low-Voltage Switchgear and Controlgear - Part 1: General Rules
- GB 14048.2 Low-Voltage Switchgear and Controlgear - part 2: Circuit Breaker
- GB 14048.3 Low-Voltage Switchgear and Controlgear - Part 3: Switches, Disconnectors, Switch-disconnectors and Fuse-Combination Units
- GB 14048.4 Low-Voltage Switchgear and Controlgear - Part 4: Electromechanical Contactors and Motor-Starters
- GB 14048.5 Low-Voltage Switchgear and Controlgear – Part 5-1: Control Circuit Devices and Switching Elements – Electromechanical Control Circuit Device
- GB 14048.6 Low-Voltage Switchgear and Controlgear – Contactors and Motor-Starters – Part 2: AC Semiconductor Motor Controllers and Starters
- GB/T 14048.7 Low-Voltage Switchgear and Controlgear – Part 7-1: Ancillary Equipment – Terminal Blocks for Copper Conductors
- GB/T 14048.8 Low-Voltage Switchgear and Controlgear – Part 7-2: Ancillary Equipment – Protective Conductor Terminal Blocks for Copper Conductor
- GB 14048.9 Low-Voltage Switchgear and Controlgear – Part 6-2: Multiple Function Equipment Control and Protective Switching Device (or Equipment) (CPS)
- GB/T 14048.10 Low-Voltage Switchgear and Controlgear – Part 5-2: Control Circuit Appliances and Switching Elements – Proximity Switches

- GB/T 14048.11 Low-Voltage Switchgear and Controlgear – Part 6-1: Multiple Function Equipment – Transfer Switching Equipment
- GB/T 14048.12 Low-Voltage Switchgear and Controlgear - Part 4-3: Contactors and Motor-Starters - AC Semiconductor Controllers and Contactors for Non-Motor Loads
- GB/T 14048.13 Low-Voltage Switchgear and Controlgear - Part 5-3: Control Circuit Devices and Switching Elements - Requirements for Proximity Devices with Defined Behavior under Fault Conditions
- GB/T 14048.14 Low-Voltage Switchgear and Controlgear - Part 5-5: Control Circuit Devices and Switching Elements - Electrical Emergency Stop Device with Mechanical Latching Function
- GB/T 14048.15 Low-Voltage Switchgear and Controlgear - Part 5-6: Control Circuit Devices and Switching Elements - DC Interface for Proximity Sensors and Switching Amplifiers (NAMUR)
- GB/T 14048.16 Low-Voltage Switchgear and Controlgear - Part 8: Loaded Thermal Protection (PTC) Control Units for Rotating Electrical Machines

This Part equivalently adopted IEC 60947-2:2006 Low-Voltage Switchgear and Controlgear – Part 2: Circuit Breaker (English Version 4.0).

The differences between this Part and IEC 60947-2:2006 are as follows:

- For the AC rated voltage specified in 1.1, the IEC specified not to exceed 1000V; for the circuit breaker with AC rated voltage of 1140V, it can implement as per this Standard; the performance and the like of circuit breaker shall be agreed between the manufacturer and the users;
- Taking into account the national conditions, the “open-type” in Clause 3 “Classification” isn’t reasonable; the commonly used terms “universal-type”; the plastic shell-type is also called “molded shell” or “plastic shell”;
- For the type test site specified in 8.1.2, IEC specifies that it can be performed in the workshop of the manufacturer or any appropriate laboratory; when the state laws and regulations specified otherwise, the relevant provisions shall be abided by;
- For the maximum rated control power supply voltage specified in 8.3.3.3.2c)2), IEC specified 30%, which may be fault; it is changed into 35%;
- CBI in L.1 can’t provide circuit protection, especially the overload protection.

This Part replaced GB 14048.2-2001 Low-Voltage Switchgear and Controlgear – Low-

Voltage Circuit Breakers.

The major differences between this Part and GB 14048.2-2001 are as follows:

- Clarify that the circuit breaker must issue the impulse withstand voltage U_{imp} ;
- Clarify the requirements for the insulation materials resistance to abnormal heat and fire:

The insulation materials fixing the conductor in the main circuit 960°C;

Other insulation materials 650°C.

- Further confirm the reset time t ;

t shall be no less than 3min; its actual value shall be recorded in the test report; the maximum reset time shall be 15min or longer stipulated by the manufacturer but not exceeding 1h. During this period, the circuit breaker can't be moved; the test closing during the reset time shall be at the interval of 1min;

- Propose higher requirements for electromagnetic compatibility;

In addition to the electronic overcurrent protection circuit breaker, specify the electromagnetic compatibility against the auxiliary components, such as undervoltage tripper, closing coil, remote status indicators, and etc., the provisions can refer to Appendix N;

- In type test, take differential treatment against the electromagnetic and electronic tripper (see 8.3.3.1.2);

- Add Appendix L, M, N, O:

Appendix L, M, O specifies the requirements and test methods for three new type of new products;

Appendix L: circuit breaker without overcurrent protection requirement, referred to as CBI;

Appendix M: residual current device module (without internal current breaking device), referred to as MRCD;

Appendix O: instantaneous tripping circuit breakers, referred to as ICB;

Appendix N: electromagnetic compatibility – excluding the additional requirements and test in the attachment of Appendix B, Appendix F and Appendix M.

This Part's Appendix A, B, C, E, F, G, H, J, L, M, N, O are normative; while the Appendix

Low-voltage switchgear and controlgear – Part 2: Circuit-breakers

1 General

The provisions of the general rules dealt with in GB 14048.1-2006 are applicable to this Part, where specifically quoted. Clauses and subclauses, tables, figures and annexes of the general rules thus applicable are identified by reference to GB 14048.1-2006, for example, 1.2.3 of GB 14048.1-2006, Table 4 of GB 14048.1-2006, or Annex A of GB 14048.1-2006.

1.1 Scope and object

This Part applies to circuit-breakers, the main contacts of which are intended to be connected to circuits, the rated voltage of which does not exceed 1 000 V a.c. or 1 500 V d.c.; it also contains additional requirements for integrally fused circuit-breakers.

This Part applies whatever the rated currents, the method of construction or the proposed applications of the circuit-breakers may be.

The requirements for circuit-breakers which are also intended to provide earth-leakage protection are contained in Annex B.

The additional requirements for circuit-breakers with electronic over-current protection are contained in Annex F.

The additional requirements for circuit-breakers for IT systems are contained in Annex H.

The requirements and test methods for electromagnetic compatibility of circuit-breakers are contained in Annex J.

The requirements for circuit-breakers not fulfilling the requirements for over-current protection are contained in Annex L.

The requirements for modular residual current devices (without integral current breaking device) are contained in Annex M.

The requirements and test methods for electromagnetic compatibility of circuit-breaker auxiliaries are contained in Annex N.

The requirements for Instantaneous tripping circuit breaker (ICB) are included in Annex

Bibliography

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- [2] GB 13539.1-2008 Low-Voltage Fuses - Part 1: General Requirements (IEC 60269-1:2006, IDT)
- [3] GB 13539.6-2002 Low-Voltage Fuses – Part 2-1: Supplementary Requirements for Fuses for Use by Authorized Persons (Fuses Mainly for Industrial Application) – Sections I to VI: Examples of Types of Standardized Fuses (idt IEC 60269-2-1:2000)
- [4] GB 13539.3-1999 Low-Voltage Fuses – Part 3: Supplementary Requirements for Fuses for Use by Unskilled Persons (Fuses Mainly for Household and Similar Applications) (idt IEC 60269-3:1987)
- [5] IEC 60410 Sampling Plans and Procedures for Inspection
- [6] GB 7251 Low-Voltage Switchgear and Controlgear Assemblies (idt IEC 60439)
- [7] GB 14048.3-2008 Low-Voltage Switchgear and Controlgear – Part 3: Switches, Disconnectors, Switch-Disconnectors and Fuse-Combination Units (IEC 60947-3:2005, IDT)
- [8] GB 14048.5-2008 Low-Voltage Switchgear and Controlgear – Part 5-1: Control Circuit Devices and Switching Elements – Electromechanical Control Circuit Devices (IEC 60947-5-1:2003, IDT)

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