

ICS 29.120.40

CCS K 31



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

GB/T 14048.6-2016

**Low-voltage switchgear and controlgear -- Part 4-2: Contactors
and motor-starters -- AC semiconductor motor controllers and
starters (including soft-starters)**

低压开关设备和控制设备 第4-2部分：接触器和电动机起动器交流电动机用半导
体控制器和起动器(含软起动器)

(English Translation)

Issued on: August 29, 2016

Implemented on: March 1, 2017

**Issued by: General Administration of Quality Supervision, Inspection and
Quarantine**

Table of Contents

Foreword...	4
Introduction...	8
1 Scope...	9
2 Normative references...	10
3 Terms, definitions, symbols and abbreviations...	11
3.1 General...	11
3.2 Terms and definitions concerning a.c. semiconductor motor controllers and starters ..	11
3.3 Terms and definitions concerning hybrid motor controllers and starters...	14
3.4 Terms and definitions concerning EMC definitions...	18
3.5 Symbols and abbreviations...	20
4 Classification...	20
5 Characteristics of a.c. semiconductor motor controllers and starters...	20
5.1 Summary of characteristics...	20
5.2 Type of equipment...	21
5.3 Rated and limiting values for main circuits...	23
5.4 Utilization category...	27
5.5 Control circuits...	28
5.6 Auxiliary circuits...	29
5.7 Characteristics of relays and releases (overload relays)...	29
5.8 Co-ordination with short-circuit protective devices (SCPD)...	32
6 Product information...	32
6.1 Nature of information...	32
6.2 Marking...	34
6.3 Instructions for installation, operation, and maintenance...	34
7 Normal service, mounting and transport conditions...	35
7.1 Normal service conditions...	35
7.2 Conditions during transport and storage...	36
7.3 Mounting...	36
7.4 Electrical system disturbances and influences...	36
8 Constructional and performance requirements...	36
8.1 Constructional requirements...	36
8.2 Performance requirements...	37

8.3 EMC requirements...	54
9 Tests...	57
9.1 Kinds of tests...	57
9.2 Compliance with constructional requirements...	59
9.3 Compliance with performance requirements...	59
Annex A (normative) Marking and identification of terminals...	83
Annex B (BLANK)...	87

Foreword

GB 14048 "Low-voltage switchgear and control gear" contains the following parts at present.

- Part 1.General rules;
- Part 2.Circuit-breakers;
- Part 3.Switches, disconnectors, switch-disconnectors and fuse-combination units;
- Part 4-1.Contactors and motor-starters - Electromechanical contactors and motor-starters (Including motor protector);
- Part 4-2.Contactors and motor-starters - AC semiconductor motor controllers and starters (including soft-starters);
- Part 4-3.Contactors and motor-starters - AC semiconductor controllers and contactors for non-motor loads;
- Part 5-1.Control circuit devices and switching element - Electromechanical control circuit devices;
- Part 5-2.Control circuit devices and switching elements - Proximity switches;
- Part 5-3.Control circuit devices and switching elements - Requirements for proximity devices with defined behaviour under fault conditions (PDDB);
- Part 5-4.Control circuit devices and switching elements - Method of assessing the performance of low-energy contacts - Special tests;
- Part 5-5.Control circuit devices and switching elements - Electrical emergency stop device with mechanical latching function;

- Part 5-6.Control circuit devices and switching elements - DC interface for proximity sensors and switching amplifiers (NAMUR);
- Part 5-7.Control circuit devices and switching elements - Requirements for proximity devices with analog output;
- Part 5-8.Control circuit devices and switching elements - Three-position enable switch;
- Part 5-9.Control circuit devices and switching elements - Flow switch;
- Part 6-1.Multiple function equipment - Transfer switching equipment;
- Part 6-2.Multiple function equipment - Control and protection switching appliances (equipment) (CPS);
- Part 7-1.Ancillary equipment - Terminal blocks for copper conductors;
- Part 7-2.Ancillary equipment - Protective conductor terminal blocks for copper conductors;
- Part 7-3.Ancillary equipment - Safety requirements for fuse terminal blocks;
- Part 8.Control units for built-in thermal protection (PTC) for rotating electrical machines.

This Part is Part 4-2 of GB 14048.The reference number is GB/T 14048.6.

This Part was drafted in accordance with the rules given in GB/T 1.1-2009.

This Part replaces GB 14048.6-2008 "Low-voltage switchgear and control gear - Part 4-2.Contactors and motor-starters - AC semiconductor motor controllers and starters (including soft-starter)". Compared with GB 14048.6-2008, in addition to some changes in the text, the main changes are as follows.

- Modify the standard's name;
- In Chapter 3, add terms and definitions. semiconductor switching device, prospective current (of a circuit and with respect to a switching device), under-voltage relay or release, under-current relay or release, stall sensitive electronic overload relay, jam sensitive electronic overload relay, CO operation, O operation, as well as the list of symbols and abbreviations;

- Delete relevant requirements for characteristics (5.1), marking (6.1) and performance (8.2.6) of "on-off operation overvoltage";
- To be consistent with the latest requirements of GB 14048.4, improve the characteristic requirements of overload relays; in Table 4, add overload tripping classes and associated tripping time;
- Modify the characteristic requirements for overload relays; Specify the requirement in 5.7.3b) "the maximum tripping time exceeding 40s";
- Modify the criteria for test results for blocking and commutating capability in Table 18;
- Add performance requirements and test methods for under-current relay or release, stall sensitive electronic overload relay, jam sensitive electronic overload relay;
- Modify the limit requirements of the EMC test, to be consistent with the requirements of relevant EMC standards;
- Delete Annex B (normative) Overload relays and releases. Put the relevant content into the text;
- Modify Annex C (normative) Co-ordination at the crossover current between the starter and associated SCPD, to be consistent with the relevant requirements of Annex B of GB14048.4;
- Delete Annex D (normative) Requirements for radiated emission tests;
- Delete Annex E (informative) Method for converting radiated emission limit in GB

4824 to equivalent value of emission power;

- Delete Annex H (informative) Terms item agreed by user and manufacturer;
- Add Annex K (normative) Extended functions within electronic overload relays.

This Part uses translation method to identically adopt IEC 60947-4-2:2011 (Edition 3.0)

"Low-voltage switchgear and control gear - Part 4-2: Contactors and motor-starters - AC semiconductor motor controllers and starters".

The Chinese documents which have consistency with the international normative references in this Part are as follows.