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

GB 16916.1-2014

**[GB/T 16916.1-2014] Residual current operated circuit-breakers
without integral overcurrent protection for household and
similar uses (RCCB) -- Part 1: General rules
(English Translation)**

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Foreword

The entire technical content of this part is mandatory.

GB 16916 "Residual current operated circuit-breakers without integral overcurrent protection for household and similar uses (RCCB)" is divided into 3 parts.

- Part 1.General rules;
- Part 21.Applicability of the general rules to RCCB functionality independence of supply voltage;
- Part 22.Applicability of the general rules to the RCCB functionally dependent on supply voltage.

This part is part 1 of GB 16916.

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

This part replaces GB 16916.1-2003 "Residual current operated circuit-breakers without integral overcurrent protection for household and similar uses (RCCB) - General rules".

As compared with GB 16916.1-2003, the main changes are as follows.

- In the Chapter 1 "Scope", EXTEND the AC rated frequency from 50 Hz or

60 Hz to 50 Hz, 60 Hz, or 50/60 Hz, that is, adding the frequency range

which can be applied to both 50 Hz and 60 Hz; meanwhile, in 5.3.7

"Standard frequency", ADD the standard frequency value 50/60 Hz;

- ADD 3.9 the definitions on insulation coordination;
- MODIFY the Table 1 and Table 2, in order to further define the limit values of the A-type RCCB breaking time and not driving time;
- ADD the 5.3.13 the standard value of rated impulse withstand voltage (Uimp);
- In Chapter 6, MODIFY the marking of the rated frequency into. "rated frequency; if RCCB is used for multiple frequencies (e.g. 50/60 Hz), it shall mark it accordingly"; ADD that it may use the symbol to mark its application for isolation";
- In 8.1.1, DEFINE the requirements for the set method of RCCB with multi-level setting values;
- In 8.1.2, ADD the requirements that it shall provide the isolation distance as necessary to satisfy the isolation function when the RCCB is at disconnected position, and PROVIDE one or two indication devices to indicate the devices of the main contact;
- MODIFY the contents of 8.1.3, 9.7.7, 9.20 and Appendix B on insulation coordination. ADD the requirements and verification of isolation function; in Table 5, INCREASE the electrical gap between the open contacts of the RCCB of the rated working voltage 230/400 V, 230 V and 400 V from 3 mm to 4 mm; ADD 9.7.7 the verification of impulse withstand voltage (across the electrical gap and across solid insulation) and the leakage current between open contacts;
- MODIFY 8.1.4.4 the description methods on the materials of the current carrying parts. Originally it clearly indicates that the material of the current carrying part is copper and other alloys, AND it is currently modified to indicate that it is metal, making examples that the material is copper and other alloys. It is defined that when using iron alloy or appropriate coating

of iron alloy, it shall use the anti-rust test to verify whether it comply with the anti-corrosion requirements. Therefore, ADD the new clause "9.25 Anti-rust test";

- MODIFY 9.5.1, specifying that the various types of conductors, hard conductors (single core or twisted) and soft conductors shall be subjected to the test, as well as the cross section range of the test conductors corresponding to the conductor types; MODIFY the Table 12, defining the tension force applied accordingly to the conductors of different cross sections;
- ADD 9.7.7 "Verification of impulse withstand voltage (across the electrical gap and across solid insulation) and the leakage current between open contacts", which includes the test methods of using impulse withstand voltage to verify the electrical gap, the leakage current between the open contacts (suitable for isolation), the insulation between open contacts, and the basic insulation withstand voltage capability. INCLUDE also the original

9.20 "verification of insulation impulse withstand voltage performance" into this test clause; ADJUST accordingly the test voltage value;

- MODIFY 9.9.2.3 a) test methods for the suddenly appeared residual sinusoidal AC current. MODIFY the method of measuring the breaking time into firstly close the switch S2 and then close the power switch S1. The time measured by the test method includes the time to supply power to the RCCB, making the measurement time more reasonable;
- MODIFY 9.9.2.4 the test procedure for the residual current in the range of 5Ideltan to 500 A, from originally selecting 6 residual current values (5 A, 10 A,

20 A, 50 A, 100 A and 200 A) for test to arbitrarily selecting 2 residual current

values from the current range of 5 A ~ 200 A to conduct test, simplifying the test procedures;

- In 9.11 the verification of RCCB working conditions under short-circuit condition, MODIFY the test circuit and description method. COMBINE the originally 5 short circuit tests respectively in single phase circuit, three phase circuit, and three phase four wire circuit, respectively, into one short circuit test diagram, and ADD an additional test circuit diagram and impedance Z structure diagram for IT test; in 9.11.2.1 the general test conditions, ADD item j). "oscillogram description", defining the methods on how to determine the external voltage, the recovery voltage, and the expected short-circuit current, etc., and ADD Figure 30 "Example of short circuit test setting oscillogram";
- In 9.11.2.3, ADD a short circuit test to verify the applicability of RCCB in IT systems;
- MODIFY 9.14 abnormal heat and flame test; MODIFY the number of samples and application prohibition parts, the test is conducted on 3 test specimens AND the glow-wire cannot be directly applied to the following parts. terminals, arc chamber and electromagnetic trip part;
- In 9.17, DEFINE the test methods to verify the multi-phase power supply requirements for the products as classified in 4.1.2.2;
- Further DEFINE the test methods to verify the correct action in 9.21.1.4 when the residual pulsating DC current is superimposed 0.006 A smooth DC current;
- DELETE the original Appendix E "Test to verify the RCCB compliance with electromagnetic compatibility (EMC) technical requirements, supplemental test procedures, and test specimen quantity list", INCLUDE the corresponding contents into the newly added clause 9.24 "Electromagnetic compatibility" as well as the newly added EMC test procedures H, I and J in the Table A.1, Table A.2 and Table A.3 in Appendix A, including the test items, the number of test specimens and the qualification judgment number,