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Residual Direct Current Detecting Device (RDC-DD) to be Used for Mode 3 Charging of Electric Vehicles

电动汽车模式 3 充电用直流剩余电流检测电器（RDC-DD）

(IEC 62955:2018, IDT)

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Standardization Administration of PRC.

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Foreword

This Document was drafted as per the rules specified in GB/T 1.1-2020 *Directives for Standardization – Part 1: Rules for the Structure and Drafting of Standardizing Documents*.

This Document used translation method to equivalently adopt IEC 62955:2018 *Residual Direct Current Detecting Device (RDC-DD) to be Used for Mode 3 Charging of Electric Vehicles*.

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

--- GB/T 2424.2-2005 Environment Tests for Electric and Electronic Products - Guidance for Damp Heat Tests (IEC 60068-3-4:2001, IDT);

--- GB/T 4208-2017 Degrees of Protection Provided by Enclosure (IP Code) (IEC 60529:2013, IDT);

--- GB 4343.1-2018 Electromagnetic Compatibility Requirements for Household Appliances, Electric Tools and Similar Apparatus - Part 1: Emission (CISPR 14-1:2011, IDT);

--- GB/T 5169.10-2017 Fire Hazard Testing for Electric and Electronic Products - Part 10: Glowing/Hot-Wire Based Test Methods - Glow-Wire Apparatus and Common Test Procedure (IEC 60695-2-10:2013, IDT);

--- GB/T 16895 (all parts) Low-Voltage Electrical Installations [IEC 60364 (all parts)];

--- GB/T 16916.1-2014 Residual Current Operated Circuit-Breakers Without Integral Overcurrent Protection for Household and Similar Uses (RCCB) - Part 1: General Rules (IEC 61008-1:2012, MOD);

--- GB/T 16917.1-2014 Residual Current Operated Circuit-breakers with Integral Overcurrent Protection for Household and Similar Uses (RCBOs) - Part 1: General Rules (IEC 61009-1:2012, MOD);

--- GB/T 18499-2008 Residual Current Operated Protective Devices (RCD) for Household and Similar Use - Electromagnetic Compatibility (IEC 61543:1995, IDT).

This Document made the following editorial modifications:

--- Move the informative references of IEC 60112 and IEC 60664-3 from Clause 2 to Bibliography;

--- Supplement the cross-sectional area of the connectable copper conductors with rated currents of 63A to 125A omitted in Table 7, which is consistent with the relevant standards of residual current protection electrical apparatus;

Residual Direct Current Detecting Device (RDC-DD) to be Used for Mode 3 Charging of Electric Vehicles

1 Scope

This Document specifies the classification, characteristics, marking, conditions of use and installation, technical requirements for structure and operation, and corresponding tests of residual direct current detecting device (RDC-DD) to be used for Mode 3 charging of electric vehicles.

This Document applies to residual direct current detecting devices (RDC-DD) for permanently connected AC charging stations of electric vehicle (mode 3 charging of electric vehicles, according to IEC 61851-1 and IEC 60364-7-722), hereafter referred to as RDC-MD (residual direct current monitoring device) or RDC-PD (residual direct current protective device), with rated voltages not exceeding 440 V AC, rated frequencies of 50 Hz, 60 Hz or 50/60 Hz and rated currents not exceeding 125 A.

NOTE 1: This document can also be used as guidance for devices for voltages up to and including 690 V AC 50 Hz, 60 Hz or 50/60 Hz, at a rated current not exceeding 250 A.

RDC-DDs are intended to remove or initiate removal of the supply to the EV in cases where a smooth residual direct current equal to or above 6 mA is detected.

NOTE 2: The value of 6 mA for smooth residual direct current was chosen to prevent impairing the correct operation of an upstream type A or type F RCD.

This Document covers two different classes of residual direct current detecting device (RDC-DD) to be used for mode 3 charging of electric vehicles (see classification in 4.1):

– RDC-MD (monitoring devices), and

– RDC-PD (protective devices).

This Document applies to devices performing simultaneously the functions of detection of the residual direct current, of comparison of the value of this current with the residual operating value, and initiating the opening of the circuit when the residual direct current exceeds 6 mA.

RDC-PDs according to this document are suitable for isolation.

RDC-DDs are intended to be used for single-phase or multi-phase circuits in TN-, TT- and IT systems.

RDC-DDs are intended to be used within the fixed installation.

RDC-DDs are intended to be used in AC circuits only. RDC-DDs according to this document are not intended for bilateral power flow between electric vehicle and fixed installation.

For RDC-DDs with integrated AC, pulsating DC and 6 mA DC detection, evaluation and mechanical switching in one unit, Annex O applies.

For RDC-MD consisting of an RDC-M-unit with a mechanical interface to a separate protective device (circuit breaker or RCD), Annex M applies.

For RDC-MD consisting of an RDC-M-module with separated residual current detection and evaluation with an electrical interface to a switching device (e.g. contactor) or a protective device (circuit breaker or RCD), Annex N applies.

2 Normative References

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

GB/T 2423.4-2008 Environmental Testing for Electric and Electronic Products - Part 2: Test Method - Test Db: Damp Heat，Cyclic (12h+12h Cycle) (IEC 60068-2-30:2005, IDT)

GB/T 3956-2008 Conductors of Insulated Cables (IEC 60228:2004, IDT)

GB/T 10963.1-2020 Electrical Accessories - Circuit-Breakers for Overcurrent Protection for Household and Similar Installations - Part 1: Circuit-Breakers for A.C. Operation (IEC 60898-1:2015, IDT)

GB/T 16935.1-2008 Insulation Coordination for Equipment within Low-Voltage Systems - Part 1: Principles Requirements and Tests (IEC 60664-1:2007, IDT)

IEC 60668-2-30 Environmental Testing – Part 2-30: Tests – Test Db: Damp Heat, Cyclic (12h+12h Cycle)

IEC 60668-3-4 Environmental Testing – Part 3-4: Supporting Documentation and Guidance – Damp Heat Tests

IEC 60364 (all parts) Low-Voltage Electrical Installations

IEC 60529 Degrees of Protection Provided by Enclosures (IP Code)

IEC 60664-1 Insulation Coordination for Equipment within Low-Voltage Systems – Part 1: Principles, Requirements and Tests

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