ISO 5474-3:2024-06 (E)

Electrically propelled road vehicles - Functional and safety requirements for power transfer between vehicle and external electric circuit - Part 3: DC power transfer

Contents

Page

Foreword ..... **v**

1 Scope **1**

2 Normative references **1**

3 Terms and definitions **2**

4 System architecture **3**

5 Environmental and operational conditions **3**

6 Safety requirements **3**
6.1 General 3
6.2 Protection of persons against electric shock 4
6.2.1 General 4
6.2.2 Compatibility with external safety devices 4
6.2.3 Insulation resistance 5
6.2.4 Touch current 5
6.2.5 Insulation coordination 6
6.2.6 Protective conductor 6
6.2.7 Basic protection when connected to an external electric circuit 7
6.2.8 Requirements for unmated vehicle contacts 7
6.2.9 Withstand capability during insulation resistance check before charging 7
6.2.10 Monitoring continuity of protective conductor 7
6.2.11 Insulation resistance monitoring system 7
6.3 Protection against thermal incident 8
6.3.1 Requirements for normal operation 8
6.3.2 Overcurrent protection 8
6.3.3 Residual energy after disconnection related to thermal incident 9
6.3.4 Arc protection 9
6.3.5 Voltage withstand capability 10
6.3.6 Voltage class B contact temperature 10
6.4 Vehicle movement 11
6.5 AC or DC electric power at the same contacts 11

7 Electromagnetic compatibility (EMC) **12**

8 Protection in case of unintended power transfer **12**

9 Functional requirements **12**
9.1 General 12
9.2 Disconnection device 12
9.3 Control pilot functions 13
9.4 Compatibility with external insulation monitoring 13
9.5 Specific requirements for the vehicle inlet 13
9.6 Control of the latching device of the vehicle coupler 13

10 Additional requirements for reverse power transfer **13**

11 Owner's manual and marking **14**

12 Test procedure **14**
12.1 General 14
12.2 Resistance of protective conductor 14
12.3 Insulation resistance 14

12.4 Withstand voltage test 14
12.4.1 Withstand voltage test between voltage class B contacts and electric chassis / PE 14
12.4.2 Differential mode overvoltage withstand test for vehicle power supply circuit 14
12.4.3 Withstand voltage test – reversed voltage during insulation resistance check 15
12.5 Touch current 16
12.6 Voltage class B contact over temperature 17
12.7 Monitoring continuity of protective conductor test 19
Annex A (informative) **Y capacitance measurement** **21**
Annex B (informative) **Outlook on megawatt charging applications** **25**
Annex C (informative) **Examples for conformance tests of voltage class A protective provisions for fault protection** **29**
Bibliography **33**