



ISO 5474-3

Electrically propelled road vehicles — Functional and safety requirements for power transfer between vehicle and external electric circuit —

**Part 3:
DC power transfer**

Véhicules routiers à propulsion électrique — Exigences fonctionnelles et exigences de sécurité pour le transfert de puissance entre le véhicule et le circuit électrique externe —

Partie 3: Transfert de puissance DC

**First edition
2024-06**

This is a preview of ISO 5474-3:2024. [Click here to purchase the full version from the ANSI store.](#)



COPYRIGHT PROTECTED DOCUMENT

© ISO 2024

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

This is a preview of ISO 5474-3:2024. [Click here to purchase the full version from the ANSI store.](#)

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

This is a preview of ISO 5474-3:2024. [Click here to purchase the full version from the ANSI store.](#)

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

This is a preview of ISO 5474-3:2024. [Click here to purchase the full version from the ANSI store.](#)

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 22 *Road vehicles*, Subcommittee SC 37 *Electrically propelled vehicles*.

A list of all parts in the ISO 5474 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.