

UL 2231-2

STANDARD FOR SAFETY

Personnel Protection Systems for Electric Vehicle (EV) Supply Circuits: Particular Requirements for Protection Devices for Use in Charging Systems



UL Standard for Safety for Personnel Protection Systems for Electric Vehicle (EV) Supply Circuits: Particular Requirements for Protection Devices for Use in Charging Systems, UL 2231-2

Second Edition, Dated September 7, 2012

Summary of Topics

This revision to ANSI/UL 2231-2 dated December 15, 2020 includes revising requirements for Isolated Circuit Systems – Capacitor Switching Transient Test and Harmonic Distortion Immunity Test; 24.1.3A, 24.2.1 and 24.9.2

Text that has been changed in any manner or impacted by UL's electronic publishing system is marked with a vertical line in the margin.

The new and revised requirements are substantially in accordance with Proposal(s) on this subject dated May 15, 2020.

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form by any means, electronic, mechanical photocopying, recording, or otherwise without prior permission of UL.

UL provides this Standard "as is" without warranty of any kind, either expressed or implied, including but not limited to, the implied warranties of merchantability or fitness for any purpose.

In no event will UL be liable for any special, incidental, consequential, indirect or similar damages, including loss of profits, lost savings, loss of data, or any other damages arising out of the use of or the inability to use this Standard, even if UL or an authorized UL representative has been advised of the possibility of such damage. In no event shall UL's liability for any damage ever exceed the price paid for this Standard, regardless of the form of the claim.

Users of the electronic versions of UL's Standards for Safety agree to defend, indemnify, and hold UL harmless from and against any loss, expense, liability, damage, claim, or judgment (including reasonable attorney's fees) resulting from any error or deviation introduced while purchaser is storing an electronic Standard on the purchaser's computer system.

No Text on This Page

This is a preview. Click here to purchase the full publication.



Association of Standardization and Certification NMX-J-668-2-ANCE Second Edition



CSA Group CAN/CSA C22.2 No. 281.2-12 First Edition



Underwriters Laboratories Inc. UL 2231-2 Second Edition

Standard for Safety for Personnel Protection Systems for Electric Vehicle (EV) Supply Circuits: Particular Requirements for Protection Devices for Use in Charging Systems

September 7, 2012

(Title Page Reprinted: December 15, 2020)





Commitment for Amendments

This standard is issued jointly by the Association of Standardization and Certification (ANCE), the Canadian Standards Association (operating as "CSA Group"), and Underwriters Laboratories Inc. (UL). Comments or proposals for revisions on any part of the standard may be submitted to ANCE, CSA Group, or UL at any time. Revisions to this standard will be made only after processing according to the standards development procedures of ANCE, CSA Group, and UL. CSA Group and UL will issue revisions to this standard by means of a new edition or revised or additional pages bearing their date of issue. ANCE will incorporate the same revisions into a new edition of the standard bearing the same date of issue as the CSA Group and UL pages.

Copyright © 2016 ANCE

Rights reserved in favor of ANCE.

ISBN 978-1-55491-815-7 © 2012 Canadian Standards Association

All rights reserved. No part of this publication may be reproduced in any form whatsoever without the prior permission of the publisher.

This Standard is subject to review within five years from the date of publication, and suggestions for its improvement will be referred to the appropriate committee. To submit a proposal for change, please send the following information to inquiries@csagroup.org and include "Proposal for change" in the subject line: Standard designation (number); relevant clause, table, and/or figure number; wording of the proposed change; and rationale for the change.

To purchase CSA Group Standards and related publications, visit CSA Group's Online Store at store.csagroup.org or call toll-free 1-800-463-6727 or 416-747-4044.

Copyright © 2020 Underwriters Laboratories Inc.

UL's Standards for Safety are copyrighted by UL. Neither a printed nor electronic copy of a Standard should be altered in any way. All of UL's Standards and all copyrights, ownerships, and rights regarding those Standards shall remain the sole and exclusive property of UL.

This ANSI/UL Standard for Safety consists of the Second Edition including revisions through December 15, 2020. The most recent designation of ANSI/UL 2231-2 as an American National Standard (ANSI) occurred on December 15, 2020. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, Title Page (front and back), or the Preface.

Comments or proposals for revisions on any part of the Standard may be submitted to UL at any time. Proposals should be submitted via a Proposal Request in UL's On-Line Collaborative Standards Development System (CSDS) at https://csds.ul.com.

To purchase UL Standards, visit UL's Standards Sales Site at http://www.shopulstandards.com/HowToOrder.aspx or call toll-free 1-888-853-3503.

CONTENTS

PKEF	NCE	
INTRO	DUCTION	
1	Scope	9
2	General	
3	Components	
4	Units of Measurement	
5	Normative References	9
CONS	TRUCTION	
_		
6	General	
7	Grounding	
8	Insulation and Protective Features	
9	Double or Reinforced Insulation Bridged By Components	
10	, ,	
11	3	
12 13	1 0	
	1 5	
14 15	·	
16	·	
10	16.1 Grounding monitor/interrupter	
	16.2 Grounding circuit impedance	
	16.3 Grounding circuit impedance	
17		
18	· · · · · · · · · · · · · · · · · · ·	
	BA Programmable Components	
PERF	DRMANCE	
19	General	19
20	Humidity Conditioning	22
2	Leakage Current Test	22
22	2 Conditioning Tests	26
	22.1 General	
	22.2 Impact tests	26
	22.3 Drop tests	
	22.4 Shock and vibration test	
23		
	23.1 General	
	23.2 Ground-fault trip threshold	
	23.3 Interrupting time	
	23.3A Environmental sequence	
	23.4 High-resistance ground fault test	
	23.5 Second neutral ground	
	23.6 Tests for isolation monitor/interrupters	
	23.7 Tests for ground monitor/interrupter	
24		
	24.1 General	
	24.2 Harmonic distortion immunity	42

		24.3 Electrostatic discharge immunity	.43
		24.4 Radiated electromagnetic field immunity	
		24.5 Immunity to conducted disturbances, induced by RF fields	
		24.6 Electrical fast transient immunity	
		24.7 Voltage dips, short interruptions and voltage variations immunity	
		24.8 Magnetic field immunity	
		24.9 Capacitor switching transient test	
		24.10 Voltage surge test	
	25	Normal Temperature Test	
	26	Dielectric Voltage-Withstand Test	
	27	Overload Test	
	28	Endurance Test	
	29	Low-Resistance Ground Fault Test	
	30	Supervisory Circuit Test	
	31	·	
	32	Abnormal Operations Test	
		Extra-Low-Resistance Ground Fault Test	
	33	Short Circuit Test	
	34	Terminal Lead Strain-Relief Test	
	35	Power-Supply Cord Strain-Relief Test	
	36	Mechanical Tests	
	37	Section Deleted	
	38	Accessible Conductive Parts with Double or Reinforced Insulation Bridged by Components	
	39	Switched Equipment Grounding Conductor Tests (US Only)	
		39.1 Switched equipment grounding conductor – contact switching sequence	
		39.2 Switched equipment grounding conductor – mechanical endurance test	
		39.3 Switched equipment grounding conductor – ground fault test	.53
	40	Leakage Cancellation Tests	
		40.1 Class A GFCI masking	.54
	41	Dust Test	.56
МA	NUFA 41A	CTURING AND PRODUCTION LINE TESTS General	.56
RA ⁻	TINGS		
	42		
		General	.56
		General	.56
мΛ	DKINI		.56
MΑ	RKIN		.56
VΙΑ		GS	
VIΑ	RKIN (
	43	GS General	
	43	GS	
	43 nex A	GS General – Reference Standards (Normative)	.57
	43	GS General	.57
٩nı	43 nex A A1	General Reference Standards (Normative) Reference Standards	.57
٩nı	43 nex A A1	GS General – Reference Standards (Normative)	.57
٩nı	43 nex A A1 nex B	GS General Reference Standards (Normative) Reference Standards French and Spanish Translations (Informative)	.57
٩nı	43 nex A A1	General Reference Standards (Normative) Reference Standards	.57
Anı Anı	43 nex A A1 nex B B1	General Reference Standards (Normative) Reference Standards French and Spanish Translations (Informative) French and Spanish Translations	.57
Anı Anı	43 nex A A1 nex B B1	GS General Reference Standards (Normative) Reference Standards French and Spanish Translations (Informative)	.57
Anı Anı	43 nex A A1 nex B B1 nex C	GS General	.57
Anı Anı	43 nex A A1 nex B B1 nex C	General	.58
Anı Anı	43 nex A A1 nex B B1 nex C	GS General	.57 .58

This is a preview. Click here to purchase the full publication.