



UL 1638

STANDARD FOR SAFETY

Visible Signaling Devices for Fire Alarm and
Signaling Systems, Including Accessories

UL Standard for Safety for Visible Signaling Devices for Fire Alarm and Signaling Systems, Including Accessories, UL 1638

Fifth Edition, Dated January 28, 2016

Summary of Topics

The following revisions are being issued for the Fifth Edition of ANSI/UL 1638, the Standard for Visible Signaling Devices for Fire Alarm and Signaling Systems, Including Accessories:

1. Addition of Visual Signal Pulse Width Marking, and Clarifications regarding Abnormal Operation and Burnout Test, and Mechanical Strength Tests for Enclosures

2. Reference Document Changes and Editorial Corrections

The new requirements are substantially in accordance with Proposal(s) on this subject dated November 18, 2016.

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.

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

Prepared by:



**ULC Standards
CAN/ULC-S526
Fourth Edition**



**Underwriters Laboratories Inc
UL 1638
Fifth Edition**

Visible Signaling Devices for Fire Alarm and Signaling Systems, Including Accessories

January 28, 2016

(Title Page Reprinted: September 6, 2017)



ANSI/UL 1638-2017

Approved by



**Standards Council of Canada
Conseil canadien des normes**

This is a preview. [Click here to purchase the full publication.](#)

Commitment for Amendments

This Standard is issued jointly by Underwriters Laboratories Inc. (UL) and ULC Standards. Amendments to this Standard will be made only after processing according to the Standards writing procedures by UL and ULC Standards.

UL and ULC Standards are separate and independent entities and each is solely responsible for its operations and business activities. The UL trade names and trademarks depicted in this document are the sole property of Underwriters Laboratories Inc. The ULC Standards trade names and trademarks depicted in this document are the sole property of ULC Standards.

ISSN 0317-526X Copyright © 2017

No part of this publication may be reproduced in any form, in an electronic retrieval system or otherwise, whatsoever without the prior permission of the publisher.

In Canada, written comments are to be sent to ULC Standards, 400 – 171 Nepean Street, Ottawa, Ontario KP2 0B4. Proposals should be submitted on a Standards Revision Request Form available from ULC Standards.

Copyright © 2017 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 Fifth Edition including revisions through September 6, 2017. The most recent designation of ANSI/UL 1638 as an American National Standard (ANSI) occurred on September 6, 2017. 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

Preface	5
1 Scope	6
2 General	7
2.1 Components	7
2.2 Units of Measurement	7
2.3 Control Unit Interface	8
2.4 Reference Publications	8
3 Glossary	10
4 Instructions and Drawings	11
5 Construction	12
5.1 General	12
5.2 Enclosures	13
5.3 Corrosion protection	19
5.4 Field wiring connections	19
5.5 Internal wiring	24
5.6 Bonding for grounding	25
5.7 Components – Electrical	26
5.8 Spacings	30
6 Marking	31
7 Performance Tests	33
7.1 General	33
7.2 Input test	35
7.3 Measurement of effective luminous intensity (light output)	36
7.4 Reserved	42
7.5 Temperature rise	42
7.6 Dielectric voltage-withstand	44
7.7 Endurance	45
7.8 Variable ambient temperature	45
7.9 Humidity	48
7.10 Abnormal operation and burnout test	49
7.10A Abnormal operation and burnout test	50
7.11 Component stress	51
7.12 Jarring	52
7.13 Vibration	53
7.14 Strain relief	53
7.15 Accelerated corrosion tests	54
7.16 Water spray	55
7.17 Polarity reversal	57
7.18 Electric shock current	57
7.19 Tests on polymeric (plastic) materials	59
7.20 Mechanical strength tests for enclosures	62A
7.21 Interference from radio frequency and electromagnetic radiation	65
7.22 Marking permanence	67
7.23 Evaluation of conformal coatings on printed wiring boards	68
7.24 Gasket materials test	68
7.25 Locked rotor test	69
8 Reserved	71
9 Manufacturing and Production Tests	71
9.1 General	71

9.2	Production-line dielectric voltage-withstand	71
9.3	Production-line grounding-continuity test for AC mains-voltage, cord-connected products	73
10	Requirements for Protective Covers and Accessories for Visible Signaling Devices	73
10.1	General	73
10.2	Installation instructions	73
10.3	Construction requirements	74
10.4	Markings	74
10.5	Performance tests	75
Tables		76
Figures		86

Annex A (Informative) – Standards for Components

Annex B (Informative) – Test Sample Sequence

Annex C (Normative) – French Translations of Required Markings

Annex D (Informative) – French Translations of Markings

Preface

This is the common UL and ULC Standard for Visible Signaling Devices for Fire Alarm and Signaling Systems, Including Accessories. It is the fourth edition of CAN/ULC-S526 and fifth edition of ANSI/UL 1638.

This Joint Standard was prepared by Underwriters Laboratories Inc., ULC Standards, and the NEMA Technical Harmonization Committee on Notification Appliances. The standard was formally approved by the UL Standards Technical Panel on Signal Appliances and the ULC Technical Committee on Fire Alarm and Life Safety Equipment and Systems. The efforts and support of the NEMA Technical Harmonization Committee, UL Standards Technical Panel, and ULC Technical Committee are gratefully acknowledged.

Only metric SI units of measurement are used in this Standard. If a value for measurement is followed by a value in other units in parentheses, the second value may be approximate. The first stated value is the requirement.

In Canada, there are two official languages, English and French. All safety warnings must be in French and English. Attention is drawn to the possibility that some Canadian authorities may require additional markings and/or installation instructions to be in both official languages.

This standard has been approved as a National Standard of Canada by the Standards Council of Canada.

This standard has been approved by the American National Standards Institute as an American National Standard.

Annexes A, B, and D are identified as informative and are for informational purposes only. Annex C is identified as normative and forms a mandatory part of this Standard.

Note: *Although the intended primary application of this Standard is stated in its scope, it is important to note that it remains the responsibility of the users of the standard to judge its suitability for their particular purpose.*

Level of Harmonization

This Standard is published as an equivalent standard for UL and ULC Standards. An equivalent standard is a standard that is substantially the same in technical content, except as follows: Technical deviations are allowed for codes and governmental regulations and those recognized as being in accordance with NAFTA Article 905, for example, because of fundamental, climatic, geographical, technological or infrastructural factors, scientific justification, or the level of protection that the country considers appropriate. Presentation is to be word for word except for editorial changes.

Interpretations

The interpretation by the standards development organization of an identical or equivalent standard is based on the literal text to determine compliance with the standard in accordance with the procedural rules of the standards development organization. If more than one interpretation of the literal text has been identified, a revision is to be proposed as soon as possible to each of the standards development organizations to more accurately reflect the intent.

Visible Signaling Devices for Fire Alarm and Signaling Systems, Including Accessories

1 Scope

1.1 This standard applies to visual signaling devices intended for indoor and/or outdoor installation:

- a) In Canada, in accordance with CSA C22.1, Canadian Electrical Code, Part I, Safety Standard for Electrical Installations; and with CAN/ULC S524, Standard for Installation of Fire Alarm Systems. Refer to CAN/ULC S525, Audible Signaling Devices for Fire Alarm and Signaling Systems, Including Accessories, CAN/ULC-S541, Speakers for Fire Alarm and Signaling Systems, Including Accessories, for requirements pertaining to audible devices and speakers.
- b) In the United States in accordance with the National Electrical Code, NFPA 70, and the National Fire Alarm and Signaling Code, NFPA 72.

1.2 These requirements cover visible signal devices for use in ordinary (non-hazardous) indoor locations and outdoor locations. This includes:

- a) Flashing visual devices used for fire alarm or emergency signaling in both public mode and private mode as defined in the glossary
- b) Emergency warning used to notify occupants that an emergency exists.
- c) Informative type visual signaling devices connected to or controlled by fire alarm or other emergency signaling system equipment, or both.

1.3 This standard also applies to protective covers and accessories used with visible signals.

1.4 This standard does not apply to visual signaling devices not intended for emergency signaling applications and intended for operation on Class 2 signal circuits as defined in

- a) In Canada, CSA C22.1, Canadian Electrical Code, Part I, Safety Standard for Electrical Installations,
- b) In the United States, the National Electrical Code, NFPA 70.

1.5 Visible signaling devices for use in hazardous or corrosive locations shall comply with the requirements of this Standard and the applicable requirements of:

- a) In Canada, CSA C22.1, Canadian Electrical Code, Part I, Safety Standard for Electrical Installations, with respect to the location hazard.
- b) In the United States, the National Electrical Code, NFPA 70.

Note: In the United States, general signaling appliances are covered by UL 464A.