CAN/ULC 529:2025A

Smoke Detectors for Fire Alarm Systems

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Standard for Smoke Detectors For Fire Alarm Systems, CAN/ULC 529

Fifth Edition, Dated June 2, 2023

Summary of Topics

This revision of CAN/ULC 529 dated October 30, 2025 includes the following changes in requirements:

– Field Testing with Integral Self-Test; 3.1A, 77.1 (title), 77.1.1, 77.1.2, and Section 77.4

– Control Unit Interface – Normal Operation; 30.1.8

Text that has been changed in any manner or impacted by ULSE'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 June 6, 2025 and September 12, 2025.

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ULC Standards
CAN/ULC 529:2025A
Fifth Edition

ULSE Inc.
ANSI/UL 268
Eighth Edition

Smoke Detectors for Fire Alarm Systems

June 2, 2023

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Approved American National Standard
ANSI

ANSI/UL 268-2025

NATIONAL STANDARD OF CANADA
STANDARDS COUNCIL OF CANADA
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ULC Preamble

International Classification for Standards (ICS): 13.220.20; 13.320

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This Standard is intended to be used for conformity assessment.

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Preface

This is the joint ULSE and ULC Standard for Smoke Detectors for Fire Alam Systems. It is the fifth edition of CAN/ULC 529 and the eighth edition of ANSI/UL 268.

This Joint Standard was prepared by UL Standards & Engagement Inc. (ULSE), ULC Standards, and the NEMA Technical Harmonization Committee on Smoke Alarms and Smoke Detectors. The standard was formally approved by the ULSE Technical Committee on Smoke Detectors and Alarms and the ULC Technical Committee on Fire Alarm and Life Safety Equipment and Systems.

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.

Annexes A, B, C,and F are identified as Normative and forms a mandatory part of this Standard.

Annexes D, E, and G are identified as Informative and are for informational purposes only.

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 identical standard between ULSE and ULC Standards.

An identical standard is a standard that is the same in technical content except for conflicts in Codes and Governmental Regulations. Presentation shall be word for word except for editorial changes.

Interpretations

The interpretation by the standards development organization of an identical or equivalent standard shall be 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 shall be proposed as soon as possible to each of the standards development organizations to more accurately reflect the intent.

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INTRODUCTION

1 Scope

1.1 This Standard sets forth requirements for smoke detectors and accessories, including mechanical guards to be employed in ordinary indoor locations in accordance with the following:

a) In Canada only:

1) Standard for the Installation of Fire Alarm Systems, ULC 524;

2) National Building Code of Canada; and

3) National Fire Code of Canada.

b) In the United States only:

1) National Fire Alarm and Signaling Code, NFPA 72.

1.2 A smoke detector (e.g. ionization-type, photoelectric-type, smoke detector with supplementary heat detection type, combination smoke type, multi-criteria type) as covered by this Standard consists of an assembly of electrical components arranged to detect one or more products of combustion. At a minimum the detector shall contain a smoke (particulate) sensor. The products of combustion may consist of visible as well as invisible smoke particles, gases, heat, radiant energy, and water vapor. The detector includes provision for the connection to a source of power, signaling, and optional remote control circuits. Additional functionality, such as a heat detector, heat sensor, or audible signaling appliance/device, is permitted to be incorporated as part of the smoke detector assembly.

1.3 This standard covers the following types of detectors:

a) Detectors intended for open area protection and for connection to a compatible power supply or control unit for operation as part of a fire alarm system;

b) Detectors intended solely for control of releasing devices such as electromagnetic door holders, fire dampers or smoke dampers;

c) Detectors intended for both applications described in (a) and (b) above; and

d) In Canada, duct detectors.

1.4 Products incorporating other functions in addition to those described in this standard, shall comply with:

a) In Canada only:

1) Control units that are covered by the Standard for Control Units for Fire Alarm Systems, ULC 527;

2) Self-contained single and multiple station smoke detectors that are covered by the Standard for Smoke Alarms, ULC 531;

3) A heat detector incorporated as a part of a smoke detector assembly, and covered by the Standard for Heat Actuated Fire Detectors for Fire Alarm Systems, ULC 530 and/or when part of a multi-criteria smoke detector;

4) Fire tests for smoke detectors integral with combination door closers and holders that are covered by the Door Closers and Holders, ULC/ORD-C228;

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5) Detectors for monitoring the smoke density within flues or stacks; and

6) A residential CO alarming device incorporated as a part of a smoke detector assembly, and covered by the CSA 6.19, Standards for Residential CO Alarming Devices, except when part of a multi-criteria smoke detector.

b) In the United States only:

1) Control units to which the detectors are intended to be connected that are covered by the Standard for Control Units for Fire-Protective Signaling Systems, UL 864;

2) Self-contained single and multiple station smoke detectors, not intended for connection to a system control unit, that are covered by the Standard for Single and Multiple Station Smoke Alarms, UL 217;

3) A heat detector incorporated as a part of a smoke detector assembly, and covered by the Standard for Heat Detectors for Fire Protective Signaling Systems, UL 521, except for the requirements of the Fire Test (Heat Detector) and/or when part of a multi-criteria smoke detector;

4) A gas and vapor detector or sensor incorporated as a part of a smoke detector assembly, and covered by the Standard for Gas and Vapor Detectors and Sensors, UL 2075, except when part of a multi-criteria smoke detector;

5) Fire tests for smoke detectors integral with combination door closers and holders that are covered by the Standard for Door Closers-Holders, With or Without Integral Smoke Detectors, UL 228;

6) Commercial-residential detectors not intended for connection to a system control unit that are covered by the Standard for Smoke Detector Monitors and Accessories for Individual Living Units of Multifamily Residences and Hotel/Motel Rooms, UL 1730; and

7) Detectors for monitoring the smoke density within flues or stacks.

1.5 These requirements also cover all remote accessories that are intended to be connected to a smoke detector.

2 General

2.1 Assembly

2.1.1 A detector shall be so constructed that it will be reliable and sufficiently durable for its intended installation and use.

2.1.2 A component of a detector shall comply with the requirements for that component, except that such requirements may be modified for the particular application.

2.2 Components

2.2.1 Except as indicated in 2.2.2, a component of a product covered by this standard shall comply with the requirements for that component. See Annex D for a list of standards covering components generally used in the products covered by this standard.

2.2.2 A component is not required to comply with a specific requirement that:

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a) Involves a feature or characteristic not required in the application of the component in the product covered by this statement; or

b) Is superseded by a requirement in this standard.

2.2.3 A component shall be used in accordance with its rating established for the intended conditions of use.

2.2.4 Specific components are incomplete in construction features or restricted in performance capabilities. Such components are intended for use only under limited conditions, such as certain temperatures not exceeding specified limits, and shall be used only under those specific conditions.

2.3 Units of Measurement

2.3.1 Values stated without parentheses are the requirement. Values in parentheses are explanatory or approximate information.

2.4 Referenced Publications

2.4.1 Any undated reference to a code or standard appearing in the requirements of this Standard shall be interpreted as referring to the latest edition of that code or standard.

2.4.2 The following publications are referenced in this Standard:

ASA S12.51/ISO 3741, *Acoustics – Determination of sound power levels and sound energy levels of noise sources using sound pressure – Precision methods for reverberation test rooms*

CSA C22.1-12, *Canadian Electrical Code, Part I, Safety Standard for Electrical Installations*

CSA C22.2 No. 0.17-00, *Evaluation of Properties of Polymeric Materials*

CSA C22.2 No. 77-95, *Motors with Inherent Overheating Protections*

MIL-HDBK-217F (2), *Reliability Prediction of Electronic Equipment*

NBC, *National Building Code of Canada*

NFC, *National Fire Code of Canada*

NFPA 72, *National Fire Alarm and Signaling Code*

Nuclear Safety and Control Act (1997, c.9)

UL 94, *Tests for Flammability of Plastic Materials for Parts in Devices and Appliances*

UL 217, *Single and Multiple Station Smoke Alarms*

UL 228, *Door Closers and Holders*

UL 268A, *Smoke Detectors for Duct Application*

UL 521, *Heat Detectors for Fire Protective Signaling Systems*

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UL 864, *Control Units for Fire-Protective Signaling Systems*

UL 1730, *Smoke Detector Monitors and Accessories for Individual Living Units of Multifamily Residences and Hotel/Motel Rooms*

UL 2111, *Overheating Protection for Motors*

ULC/ORD-C228, *Door Closers and Holders*

ULC 524, *Installation of Fire Alarm Systems*

ULC 527, *Control Units for Fire Alarm Systems*

ULC 530, *Heat Actuated Fire Detectors for Fire Alarm Systems*

ULC 531, *Smoke Alarms*

ULC 536, *Inspection and Testing of Fire Alarm Systems*

ULC-S537, *Verification of Fire Alarm Systems*

3 Glossary

3.1 For the purpose of this standard, the following definitions apply.

3.1A AEROSOL (STIMULI) – particles suspended in gas or air used to stimulate a response from the smoke sensor, including but not limited to canned smoke, cotton wick, or punk stick.

3.2 ALARM SIGNAL – A signal intended to indicate an emergency condition that requires immediate action, such as a signal indicative of fire.

3.3 ANNUNCIATOR – A unit containing one or more indicator lamps, alphanumeric displays, or other equivalent means in which each indication provides status information about a circuit, condition, or location.

3.4 BALANCE – The balance of a sampling pipe network is the amount of air being drawn from the sampling port with the least amount of air flow divided by the average air flow through all sampling ports expressed in percentage (%).

3.5 BROILING – The fresh-frozen hamburger cooking process used to cook the fresh-frozen hamburger in the oven of an electric range.

3.6 COMBINATION SMOKE DETECTOR – A smoke detector that employs more than one smoke detecting principle in one unit. The sensor output signals are individually evaluated but not combined to determine when an alarm signal is warranted.

3.7 COMPONENT:

a) LIMITED-LIFE – A component that is likely to fail during the anticipated service life of a detector and may be periodically replaced (where failure is monitored) when failure of the component affects the intended operation, gas and/or smoke sensitivity, or both. Typical examples of such components include incandescent lamps, electronic tube heaters, and functional heating elements.

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