Second edition
2014-12-15

Fire detection and alarm systems —

Part 8: Point-type fire detectors using a carbon monoxide sensor in combination with a heat sensor

Systèmes de détection et d'alarme d'incendie —

Partie 8: Détecteurs ponctuels utilisant un capteur de monoxide de carbone en combinaison avec un capteur de chaleur

Reference number
ISO 7240-8:2014(E)

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

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Foreword

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 documents 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).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword — Supplementary information.

The committee responsible for this document is ISO/TC 21, *Equipment for fire protection and firefighting*, Subcommittee SC 3, *Fire detection and alarm systems*.

This second edition cancels and replaces the first edition (ISO 7240-8:2007), which has been technically revised.

ISO 7240 consists of the following parts, under the general title *Fire detection and alarm systems*:

— *Part 1: General and definitions*

— *Part 2: Control and indicating equipment*

— *Part 3: Audible alarm devices*

— *Part 4: Power supply equipment*

— *Part 5: Point-type heat detectors*

— *Part 6: Carbon monoxide fire detectors using electro-chemical cells*

— *Part 7: Point-type smoke detectors using scattered light, transmitted light or ionization*

— *Part 8: Point-type fire detectors using a carbon monoxide sensor in combination with a heat sensor*

— *Part 9: Test fires for fire detectors* [Technical Specification]

— *Part 10: Point-type flame detectors*

— *Part 11: Manual call points*

— *Part 12: Line type smoke detectors using a transmitted optical beam*

— *Part 13: Compatibility assessment of system components*

— *Part 14: Design, installation, commissioning and service of fire detection and fire alarm systems in and around buildings*

— *Part 15: Point-type fire detectors using smoke and heat sensors*

— *Part 16: Sound system control and indicating equipment*

— *Part 17: Short-circuit isolators*

— *Part 18: Input/output devices*

— *Part 19: Design, installation, commissioning and service of sound systems for emergency purposes*

— *Part 20: Aspirating smoke detectors*

— *Part 21: Routing equipment*

— *Part 22: Smoke-detection equipment for ducts*

— *Part 23: Visual alarm devices*

— *Part 24: Sound-system loudspeakers*

— *Part 25: Components using radio transmission paths*

— *Part 27: Point-type fire detectors using scattered light, transmitted-light or ionization smoke sensor, an electrochemical-cell carbon-monoxide sensor and a heat sensor*

— *Part 28: Fire protection control equipment*

The following parts are under preparation:

— *Part 29: Video fire detectors*

Introduction

This part of ISO 7240 has been prepared by the Subcommittee ISO/TC 21/SC 3 and is based on ISO 7240-8:2007.

A fire detection and fire alarm system is required to function satisfactorily not only in the event of a fire, but also during and after exposure to conditions likely to be met in practice such as corrosion, vibration, direct impact, indirect shock, and electromagnetic interference. Some tests specified are intended to assess the performance of the fire detectors under such conditions.

Test Fires TF2, TF3, TF4, and TF5 from ISO/TS 7240-9 have been included to verify the detection performance of point fire detectors using a combination of carbon monoxide and heat sensors (CO) sensors. TF4 and TF5 specifically demonstrate the influence of the heat sensor(s). For these Test Fires, the CO level and, where applicable, the temperature is used as test validity criteria. This part of ISO 7240 is not intended to place any other restrictions on the design and construction of such detectors.

Carbon monoxide (CO) fire detectors can react promptly to slow smouldering fires involving carbonaceous materials. Although in the majority of fires, the products of combustion will be transported by convection, the gaseous nature of CO means that it will also diffuse and, particularly in low energy fires, it can move ahead of the smoke plume and, thus, provide earlier detection.

CO fire detectors alone might not react quickly to flaming fires and the addition of a heat sensor as specified in this part of ISO 7240 provides better detection to a broader spectrum of fires.

CO fire detectors based on a combination of a CO sensor and a heat sensor might also be better suited to applications where smoke detectors can produce unwanted alarms due to the presence of dust, steam, or cooking vapours, etc.

While CO gas has greater mobility than smoke, it can be diluted by ventilation systems and be affected by convection currents. Hence, the same considerations as for point smoke detectors should be taken into account. Re-circulating systems confined to a single room have little effect on dilution, as this is similar to the natural diffusion of the CO gas.

It is important that the location of CO fire detectors take into account areas where false operation or non-operation is likely. Some typical locations where it is important to carefully evaluate the use of CO fire detectors are as follows:

a) areas where CO gas can be present from exhausts and normal manufacturing processes;

   EXAMPLE Car parks, car-park return air plenums, loading docks.

b) confined areas where tobacco smoking is likely.