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Fire detection and alarm systems —

Part 8: Carbon monoxide fire detectors using an electro-chemical cell in combination with a heat sensor

Systèmes de détection et d'alarme d'incendie —

Partie 8: Détecteurs de monoxyde de carbone pour la détection d'incendie utilisant une cellule électrochimique en combinaison avec un capteur de chaleur

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Contents

Page

Foreword v

Introduction vii

1 Scope 1

2 Normative references 1

3 Definitions 2

4 General requirements 2
4.1 Compliance 2
4.2 Individual alarm indication 2
4.3 Connection of ancillary devices 2
4.4 Monitoring of detachable detectors 2
4.5 Manufacturer's adjustments 2
4.6 On-site adjustment of response behaviour 2
4.7 Rate-sensitive response behaviour 3
4.8 Marking 3
4.9 Data 4
4.10 Requirements for software controlled detectors 4

5 Tests 5
5.1 General 5
5.2 Repeatability of CO response 8
5.3 Directional dependence of CO response 8
5.4 Directional dependence of heat response 8
5.5 Lower limit of heat sensitivity 10
5.6 Reproducibility of CO response 10
5.7 Reproducibility of heat response 11
5.8 Exposure to chemical agents at environmental concentrations 11
5.9 Long-term stability of CO response 12
5.10 Saturation 12
5.11 Exposure to chemical agents that can be present during a fire 13
5.12 Variation in supply parameters 14
5.13 Air movement 15
5.14 Dry heat (operational) 15
5.15 Cold (operational) 16
5.16 Damp heat, cyclic (operational) 17
5.17 Damp heat, steady state (endurance) 18
5.18 Low humidity, steady state (endurance) 19
5.19 Sulfur dioxide (SO_2) corrosion (endurance) 20
5.20 Shock (operational) 21
5.21 Impact (operational) 22
5.22 Vibration, sinusoidal (operational) 23
5.23 Vibration, sinusoidal (endurance) 24
5.24 Electromagnetic compatibility (EMC), immunity tests (operational) 25
5.25 Fire sensitivity 26

6 Test report 28

Annex A (normative) **Gas test chamber for response threshold value and cross sensitivity measurements** 29

Annex B (normative) **Heat tunnel for response time and response temperature measurements** 30

Annex C (normative) **Apparatus for impact test** 31

Annex D (normative) **Fire test room** **33**
Annex E (normative) **Smouldering (pyrolysis) wood fire (TF2)** **35**
Annex F (normative) **Glowing smouldering cotton fire (TF3)** **38**
Annex G (normative) **Open plastics (polyurethane) fire (TF4)** **41**
Annex H (normative) **Liquid (heptane) fire (TF5)** **43**
Annex I (normative) **Deep-seated smouldering cotton fire (TF9)** **45**
Annex J (informative) **Information concerning the construction of the gas test chamber** **47**
Annex K (informative) **Construction of the heat tunnel** **49**

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 7240-8 was prepared by Technical Committee ISO/TC 21, *Equipment for fire protection and fire fighting*, Subcommittee SC 3, *Fire detection and alarm systems*.

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 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: Carbon monoxide fire detectors using an electro-chemical cell 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: Guidelines for drafting codes of practice for design, installation and use of fire detection and fire alarm systems in and around buildings* [Technical Report]

— *Part 15: Point type fire detectors using scattered light, transmitted light or ionization sensors in combination with a heat sensor*

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

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

— *Part 21: Routing equipment*

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

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

Part 26, dealing with oil mist detectors, and Part 28, dealing with fire protection control equipment, are under development.

Introduction

This part of ISO 7240 has been prepared by the Subcommittee ISO/TC 21/SC 3 and is based on both ISO 7240-5 for heat detectors and ISO 7240-6 for carbon monoxide fire detectors.

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.

The performance of fire detectors is assessed from results obtained in specific tests; 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 are transported by convection, the gaseous nature of CO means that it also diffuses 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 described in this part of ISO 7240 provides better detection to a broader spectrum of fires.

CO fire detectors based on electrochemical cells might be better suited to applications where smoke detectors can produce unwanted alarms due to the presence of dust, steam or cooking vapours, etc.

Whilst 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

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

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

b) confined areas where cigarette smoking is likely.