
**Smoke and heat control systems —
Part 9:
Specification for control equipment**

*Systèmes pour le contrôle des fumées et de la chaleur —
Partie 9: Spécifications pour les équipements de commande*

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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.

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 21927-9 was prepared by Technical Committee ISO/TC 21, *Equipment for fire protection and fire fighting*, Subcommittee SC 11, *Smoke and heat control systems and components*.

ISO 21927 consists of the following parts, under the general title *Smoke and heat control systems*:

- *Part 1: Specification for smoke barriers*
- *Part 2: Specification for natural smoke and heat exhaust ventilators*
- *Part 3: Specification for powered smoke and heat exhaust ventilators*
- *Part 9: Specification for control equipment*
- *Part 10: Specification for power output devices*

Introduction

Smoke- and heat-control systems (SHCS) create and maintain smoke-free areas in a construction works by controlling smoke flow, thus improving the conditions for the safe escape and/or rescue of people and animals and the protection of property, and permit fire-fighting in the early stages of the fire. The use of smoke and heat exhaust ventilation systems (SHEVS) to create smoke-free areas beneath a buoyant smoke layer has become widespread. Their value in assisting in the evacuation of people from construction works, reducing fire damage and financial loss by preventing smoke logging, facilitating fire fighting, reducing roof temperatures and retarding the lateral spread of fire, is firmly established. For these benefits to be obtained, it is essential that smoke and heat exhaust ventilators operate fully and reliably whenever called upon to do so during their installed life. A heat and smoke exhaust ventilation system is a scheme of safety equipment intended to perform a positive role in a fire emergency.

Components for any smoke and heat control system are installed as part of a properly designed system.

Smoke and heat control systems help to:

- keep the escape and access routes free from smoke;
- facilitate fire fighting operations;
- delay and/or prevent flashover and thus full development of the fire;
- protect equipment and furnishings;
- reduce thermal effects on structural components during a fire;
- reduce damage caused by thermal decomposition products and hot gases.

Pressure differential systems are used to either positively pressurize spaces separated from the fire or to depressurize the space containing the fire in order to limit or prevent the flow of smoke and heat into adjacent spaces. A typical use would be to pressurize an escape stairwell in order to protect vertical means of escape.

Depending on the design of the system, natural or powered smoke and heat ventilators can be used in a smoke and heat control system.

Control equipment (c.e.) is required to control all components in a SHCS, such as:

- natural ventilators;
- powered ventilators;
- smoke barriers;
- smoke dampers;
- air inlets.

SHCS control equipment may also provide control for day-to-day ventilation and signals to other fire safety equipment under fire conditions.

SHCS control equipment may be for extra-low-voltage or low-voltage electrical systems or pneumatic systems or any combination of these.

Power output devices for control equipment are dealt with in ISO 21927-10.

Smoke and heat control systems —

Part 9: Specification for control equipment

1 Scope

This part of ISO 21927 specifies the product performance requirements, classifications and test methods for control equipment designed for use in smoke- and heat-control systems (SHCS) in buildings.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 3098-2, *Technical product documentation — Lettering — Part 2: Latin alphabet, numerals and marks*

ISO 6988, *Metallic and other non-organic coatings — Sulfur dioxide test with general condensation of moisture*

ISO 7240-5:2003, *Fire detection and alarm systems — Part 5: Point-type heat detectors*

ISO 7240-6, *Fire detection and alarm systems — Part 6: Carbon monoxide fire detectors using electro-chemical cells*

ISO 7240-7, *Fire detection and alarm systems — Part 7: Point-type smoke detectors using scattered light, transmitted light or ionization*

ISO 7240-8, *Fire detection and alarm systems — Part 8: Carbon monoxide fire detectors using an electro-chemical cell in combination with a heat sensor*

ISO 7240-10, *Fire detection and alarm systems — Part 10: Point-type flame detectors*

ISO 7240-11:2005, *Fire detection and alarm systems — Part 11: Manual call points*

ISO 7240-12, *Fire detection and alarm systems — Part 12: Line type smoke detectors using a transmitted optical beam*

ISO 7240-15, *Fire detection and alarm systems — Part 15: Point type fire detectors using scattered light, transmitted light or ionization sensors in combination with a heat sensor*

ISO 7240-20, *Fire detection and alarm systems — Part 20: Aspirating smoke detectors*

ISO 7240-27, *Fire detection and alarm systems — 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*

ISO/IEC 17000, *Conformity assessment — Vocabulary and general principles*

ISO/IEC 17050-1, *Conformity assessment — Supplier's declaration of conformity — Part 1: General requirements*

ISO/IEC 17050-2, *Conformity assessment — Supplier's declaration of conformity — Part 2: Supporting documentation*

ISO 21927-3, *Smoke and heat control systems — Part 3: Specification for powered smoke and heat exhaust ventilators*

ISO 21927-10, *Smoke and heat control systems — Part 10: Specification for power output devices*

EN 50130-4, *Alarm systems — Electromagnetic compatibility — Product family standard: Immunity requirements for components of fire, intruder and social alarm systems*

IEC 60068-1:1994, *Environmental testing — Part 1: General and guidance*

IEC 60068-2-1 *Environmental testing — Part 2-1: Tests — Tests A: Cold*

IEC 60068-2-6, *Environmental testing — Part 2-6: Tests — Test Fc: Vibration (sinusoidal)*

IEC 60068-2-47, *Environmental testing — Part 2-47: Test — Mounting of specimens for vibration, impact and similar dynamic tests*

IEC 60068-2-52:1996, *Environmental testing — Part 2: Tests — Test Kb: Salt mist, cyclic (sodium chloride solution)*

IEC 60068-2-75, *Environmental testing — Part 2-75: Tests — Test Eh: Hammer tests*

IEC 60068-2-78, *Environmental testing — Part 2-78: Tests — Test Cab: Damp heat, steady state*

IEC 60529:1992, *Degrees of protection provided by enclosures (IP Code)*

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3 Terms, definitions and abbreviated terms

For the purposes of this document, the following terms, definitions and abbreviations apply.

3.1 Terms and definitions

3.1.1

access level

one of several states of control equipment in which selected:

- controls can be operated
- manual operations can be carried out
- indications are visible
- information can be obtained

NOTE Further information is given in Annex A.

3.1.2

addressable point

point which can be individually identified at the control panel

3.1.3**basic control panel****b.c.p.**

single-operation initiating device for a smoke and heat control system component, e.g. manual control point or single-use gas bottle assembly

NOTE A b.c.p. may be regarded as an emergency control panel.

3.1.4**compulsory indication**

visual or audible indications (e.g. light-emitting indicator, label, alphanumeric display, sounder) required by this International Standard

NOTE If options with requirements are chosen, then indications required within those options are compulsory.

3.1.5**control equipment****c.e.**

initiating device for a smoke and heat control system component, e.g. control panel, basic control panel, mechanical control panel

3.1.6**control panel****c.p.**

multi-operation initiating device for a smoke and heat control system

3.1.7**fire condition**

when a fire signal has been received and processed by the control equipment and the intended outputs and indications have been given

3.1.8**fire position**

configuration of a smoke and heat control system component to be achieved and sustained while the system is venting smoke and heat

<http://www.iso.org/iso/standard/21927-9>

3.1.9**frangible element**

component which, after receiving a blow or pressure, is physically broken or is visibly displaced by change of position and remains in that condition until replaced or reset

3.1.10**hierarchical system**

networked system with one control panel designated as the main control panel which fulfils at least the following tasks:

- receives and transmit signals from/to other networked control equipment;
- displays the status of the networked control equipment.

3.1.11**manual control point**

initiation device for a smoke and heat control system provided for use in an emergency by building occupants or fire fighters

3.1.12

mechanical control panel

m.c.p.

operation initiation device for a smoke and heat control system component where the initiation is provided through a mechanical linkage (e.g. by release of tension in a cable) between the control equipment and the component

3.1.13

networked system

system where control panels are interconnected and able to exchange information electronically

3.1.14

response time

period between the signal to operate being received by the control equipment and the achievement of the fire condition

3.1.15

site-specific data

information that the software uses and that is specific to an installation

NOTE This may include information such as allocation of devices to specific zones, time settings and sensitivity levels.

3.1.16

smoke- and heat-control system

SHCS

arrangement of components installed in a construction works to limit the effects of smoke and heat from a fire

3.1.17

smoke- and heat-exhaust ventilator

SHEV

device specially designed to move smoke and hot gases out of the construction works under conditions of fire

3.1.18

standby condition

quiescent condition when the control equipment is fully operational and waiting to receive a fire signal

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3.1.19

transmission path

physical connection, external to the cabinet of the control equipment for the transmission of information and/or power between the control equipment and other components of a SHCS, and/or between parts of a control equipment contained in different cabinets

3.1.20

ventilator

device for enabling the movement of gases into or out of a construction works

3.1.21

zone

individual input or output, usually relating to a geographical sub-division of the protected premises

3.1.22

thermal release element

temperature-sensitive device which responds to initiate a subsequent action

3.2 Abbreviated terms

b.c.p.	basic control panel
c.e.	control equipment
c.i.e.	control and indicating equipment (as specified in ISO 7240-2)
c.p.	control panel
DP	dual purpose
m.c.p.	mechanical control panel
p.o.d.	power output device
p.s.e.	power supply equipment
SHCS	smoke- and heat-control system
SHEV	smoke- and heat-exhaust ventilator
SHEVS	smoke- and heat-exhaust ventilation system
BMS	Building Management System

4 General

4.1 Overview

Figure 1 illustrates the structure of this part of ISO 21927 and shows how and where the requirements for each type of control equipment are distributed.

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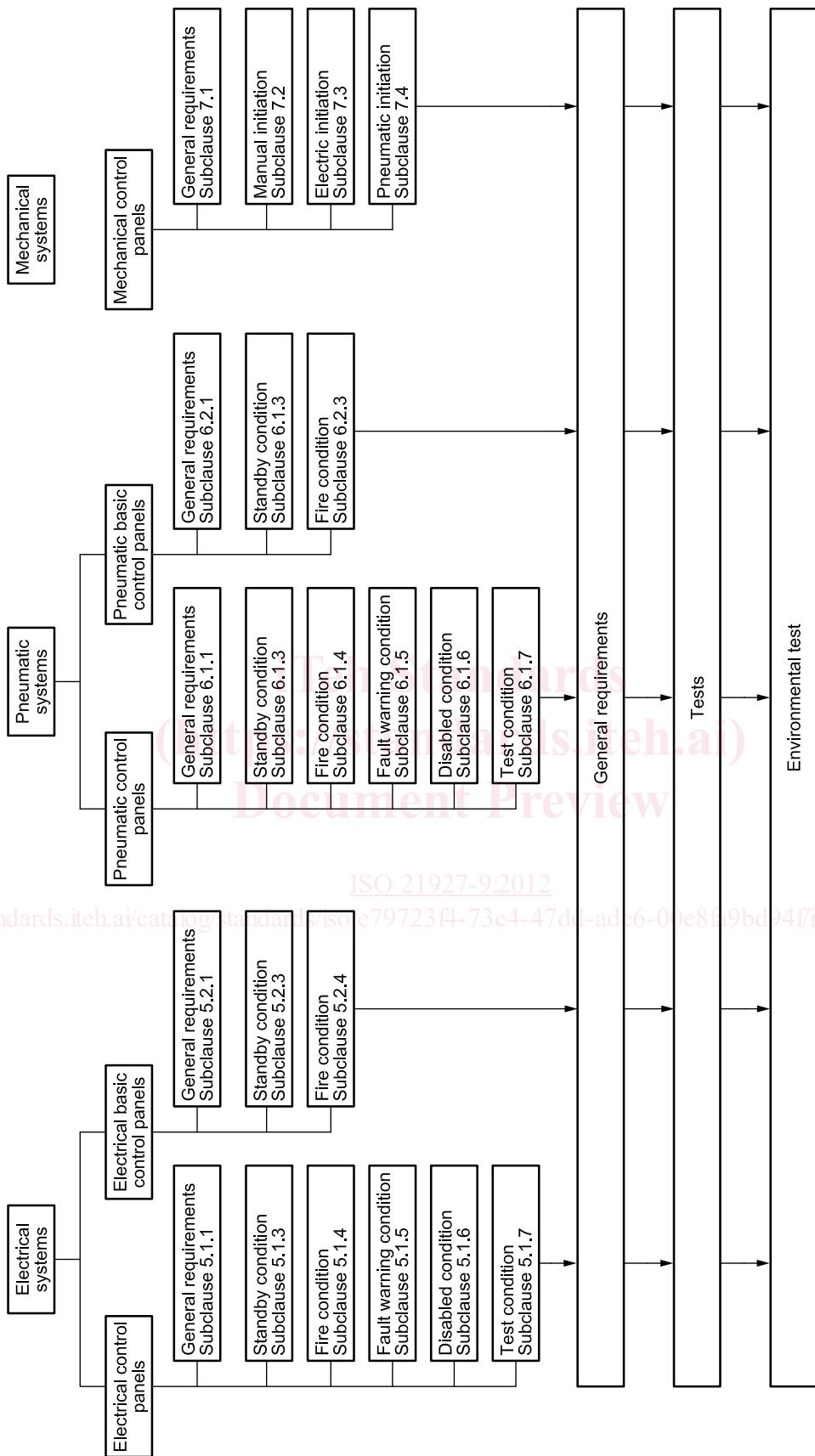


Figure 1 — Overview of the structure of this part of ISO 21927