

# Guide to fire detection systems



Fire Detection  
Line

 **EL.MO.** SPA



## GUIDE PURPOSE

This guide illustrates operating mode of fire detection systems and how to set and wire EL.MO. systems correctly. The meaning of words in *italic* is defined in the glossary at the end of this guide.

## WARNINGS

Use devices for the purpose for which they have been designed only.

Examples and specifications herein are valid starting from the day of publication; always refer to updated product manuals to be downloaded at [www.elmospa.com](http://www.elmospa.com) (registration required).

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## PART 1

# LAWS AND FIRE DETECTION SYSTEMS PRINCIPLES

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## 1. LAWS

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### 1.1 NATIONAL LAWS

Project designers and installers must abide to the local laws, which are not detailed in this document.

In the European Union, laws usually reference the documents introduced in the following paragraphs.

Outside the EU, you can still use the European Standards as useful guidelines for creating an efficient and quality system, but you need to make sure that they do not conflict with the laws of your country.

### 1.2 EUROPEAN DIRECTIVES AND REGULATIONS

Directives and regulations are legislative acts of the European Union that member countries shall implement with specific laws.

#### - EU Directive 2014/34

"on the harmonisation of the laws of the Member States relating to equipment and protective systems intended for use in potentially explosive atmospheres (recast)".

- It is part of "ATEX directives" (from French Atmosphères Explosibles, "explosive atmospheres").
- It regulates characteristics of devices to be installed in areas with potentially explosive atmospheres.
- It states that devices installed in areas subject to explosion risks shall bear the ATEX certificate (for some specific risk levels).

#### - Regulation (EU) No. 305/2011

"laying down harmonised conditions for the marketing of construction products".

- It is also known as "CPR Regulation" (which stands for Construction Products Regulation).
- It sets out that all construction products regulated by European laws can be placed on the market only with the CE marking and the Declaration of Performance (DoP).
- It regulates CE marking characteristics and Declaration of Performance contents.
- It sets out the requirements a manufacturer's product shall comply with in order to be affixed with CE marking.

### 1.3 EUROPEAN STANDARDS

European standards are technical specifications defining requirements for products, production processes, and services developed following some basic principles. They include:

- System standards - concerning systems commissioning, they define, for example, cables to use, device positioning, power supply mode and autonomy. Example TS EN 54-14 standard.
- Product standards - concerning products manufacturing and the characteristics they shall feature to be used within a specific system. Example EN 54-2 standard.

These specifications are voluntary: they are not the result of a legislation act. However, there can be laws referring to such standards, some times in a mandatory way, some others in a preferential way in compliance with the law.

Standards that are not referred to by laws represent in any case valid criteria to verify the good quality of products and systems.



- EN 54 Series
  - Product standards regulate the building process of components of fire detection systems:
    - EN 54-2: control and indicating equipment
    - EN 54-3: fire alarm devices - sounders
    - EN 54-4: power supply equipment
    - EN 54-5: heat detectors - point detectors
    - EN 54-7: smoke detectors - point detectors using scattered light, transmitted light or ionization
    - EN 54-10: flame detectors - point detectors
    - EN 54-11: manual call points
    - EN 54-12: smoke detectors - line detectors using an optical beam
    - EN 54-16: voice alarm control and indicating equipment
    - EN 54-17: short-circuit isolators
    - EN 54-18: input/output devices
    - EN 54-20: aspirating smoke detectors
    - EN 54-21: alarm transmission and fault warning routing equipment
    - EN 54-23: fire alarm devices - visual alarm devices
    - EN 54-24: components of voice alarm devices - loudspeakers
    - EN 54-25: components using radio links
  - TS EN 54-1 system standard lists system functions (fig. 1) which refer to the following devices provided by EL.MO. (in bold mandatory components):
    - A: fire detectors**
    - B: control panel**
    - C: alarm devices**
    - D: manual call points**
    - E: alarm transmission routing equipment
    - G: actuators
    - J: fault warning routing equipment
    - L: power supply units**
    - M: voice alarm control and indicating equipment
    - N: auxiliary inputs and outputs
  - TS EN 54-14 system standard...
    - sets out the use of components complying with **EN 54 standard** (par 6.1).
    - defines the division in zones of the area to be protected (par. 6.3).
    - lays down devices positioning and their quantity (par 6.5).
    - sets out requirements for fire systems cables (cap. 6.11).
    - regulates periodic maintenance of systems (cap. 11).
- IEC 60079 Standard
  - It regulates building features of products intended for use in areas with explosive atmospheres.



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