

EN54-13 Overview

EN54-13:2005

Fire detection and fire alarm systems – Part 13: Compatibility assessment of system components.

Purpose

EN54-13 is part of the EN54 series of standards. It is a standard for system performance rather than a product standard.

The standard specifies the minimum functions required to be performed by the control and indicating equipment (CIE) and associated components and it specifies the requirements for network systems. It extends the monitoring requirements for all transmission paths over and above the requirements specified in individual product standards.

EN54-13 is for use in fire detection and fire alarm systems in accordance with EN54. It is not applicable to, or referenced in, any other applications.

It is specified in the installation standards or codes of practice of many countries to provide evidence that the complete system will function as intended under all expected operating conditions.

Scope

The following are the key points from the scope of the standard.

- It specifies the requirements for compatibility and connectability assessment of system components.
- It specifies system design and functional requirements where these are necessary for compatibility.
- It specifies the requirements for the integrity of the fire detection and alarm system when connected to other systems.
- It specifies the test and assessment methods required to show compliance.
- It is applicable to systems where the control and indicating equipment and components are interconnected by electrical wires.
- It may be used for guidance for systems where the control and indicating equipment and components are connected by other means such as radio and optical fibre.

Definitions

The following are the key definitions in the standard not directly identified in other parts of EN54:

Component Type 1: A device performing a function for the protection of life and/or property that is required by European or national guidelines and regulations

Component Type 2: A device performing a function for the protection of life and/or property that is not required by European or national guidelines or regulations

Compatibility: Ability of a component type 1 to operate with CIE

- Within the limits specified for each component
- Within specified limits given by the relevant parts of EN54
- Within specified configurations of systems

Connectability: Ability of component type 2 to operate without jeopardising the performance of the fire detection and fire alarm system

Compliance

In order to comply, the system design and the compatibility or connectability of its components shall:

- Meet the system design requirements as specified in Clause 4.
- Be assessed with the requirements as specified in Clause 5.1
- Be tested using the test methods as specified in Clauses 5.2 to 5.5

The use of 3rd party testing laboratories, whose schedule of accreditation includes EN54-13, is recommended to provide independent evidence of conformity.

For compliance using technologies other than electrical wiring (e.g. fibre optics), the assessment and the test methods required should be discussed and agreed with the test laboratory.

For information on the compliance of Advanced Electronics products please refer to the individual declarations of conformity for each product. These list the respective panels and the components shown to be compatible by independent laboratory analysis and testing.

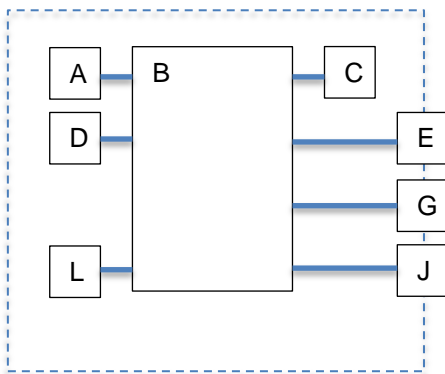
Requirements

Basic System

[1] Components shall:

- Meet the requirements of EN54-13
- Meet the requirements of the relevant part of EN54 (*where one exists*)
- Meet the requirements of any national guidelines of the countries in which the product will be installed.

[2] The system shall provide at least the following functions as defined in EN54-1 and individual components shall be certified in accordance with any relevant options with requirements to meet these functions:



- [A] Automatic fire detection function
- [B] CIE function
- [C] Fire alarm function
- [D] Manual initiating function
- [E] Fire alarm routing function
- [G] Fire protection function
- [J] Fault warning routing function
- [L] power supply

[3] If a function of the fire detection and fire alarm system (FDAS) is shared with any other system then the function of the FDAS shall not be jeopardised.

[4] If a component performs a non-FDAS function then this shall not jeopardise the FDAS.

Networked Systems

A network is defined as a fire detection and fire alarm system in which more than one CIE are connected together and able to exchange information. The basic requirements are:

- A system fault on a CIE shall only affect that CIE and its associated components. In accordance with EN54-2 Clause 13.7, a system fault should not result in the loss of more than 512 detectors and their associated mandatory functions. Common functions such as fire alarm routing shall not be affected.
- A single fault on the network transmission paths shall not adversely affect the correct functioning of any part of the system.
- It shall be possible to identify the section of the transmission path affected by the fault.
- All software used for networking shall conform to the requirements specified in EN54-2.

Specific requirements are defined for hierarchical systems comprising of a main CIE and one or more subsystem CIE where all controls, indications and mandatory functions are provided by the main CIE. If this is in control of more than 512 detectors or call points either directly or indirectly then, in accordance with the requirements of EN54-2 Clause 13.7, a system fault on the main CIE shall not result in the loss of more than 512 devices and their mandatory functions. Common mandatory functions such as fire alarm routing must not be affected for the remaining devices.

Components

Components are classified into two types as component type 1 and component type 2.

All components which perform mandatory or optional functions with requirements are classified as component type 1 and must be assessed and tested for compatibility.

To be compatible, components type 1 shall operate within the limits of the relevant part of EN54 and within the limits specified for each component.

Typical components type 1 are:

- Fire detection functions: e.g. heat, smoke, flame detectors and call points, etc. and isolators, etc.
- Fire alarm functions: e.g. sounders, beacons, etc. and inputs and outputs to other systems such as pagers, etc.
- Fire protection functions: e.g. inputs and outputs to fire extinguishing, smoke control, door holders, etc.
- External indication: e.g. remote panels, fire brigade panels, etc.
- Connection devices between transmission paths: e.g. fibre optical converters

If there is no relevant EN54 standard for the component then it must, at least, meet the requirements of EN54-1 and meet the EMC immunity requirements of EN50130-4.

All other input and output devices are classified as component type 2 and must be assessed and tested for connectability.

To be connectable, components type 2 must not jeopardise the function of the FDAS.

Typical components type 2 are:

- External indication: printers, building management interfaces, remote panels (if used for supplementary information only), etc.
- Inputs and outputs to other systems

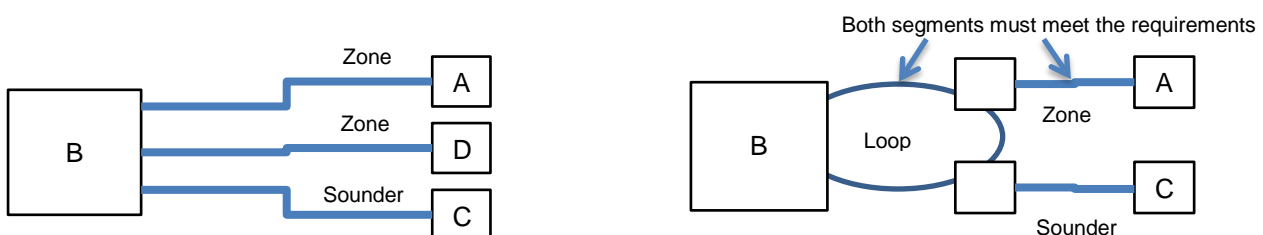
The operation of any remote control shall have the same effect as if the operation was performed at the CIE itself.

Transmission Paths

The requirements are applicable to all transmission paths. A transmission path may provide a means for:

- The transmission of information (e.g. network connections)
- The transmission of information and power (e.g. detector loop or conventional zone circuit)
- The transmission of power

A single fault shall not affect another transmission path and is applicable to all transmission paths.



The means as specified in EN54-2 Clause 12.5.2 to minimise the effects of fault conditions shall complete the restoration within 300 seconds.

A fault condition on a transmission path to other systems shall not jeopardise the correct functioning of the FDAS.

National guidelines may require the consequences of faults are limited.

Interfaces to fire protection systems

All components interfacing between the FDAS and the fire protection system (FPS) shall be component type 1 and are part of the FDAS.

The transmission path between the input and output components of the FDAS and the FPS may be monitored by either the FDAS or the FPS.

Tests

The test schedule for compatibility is designed to ensure that each component correctly exercises its functions (fire alarm, fault warning, disable and test conditions) in all expected operational conditions. To achieve this, all tests are performed in both:

- Minimum supply voltage (AC and battery) with maximum load
- Maximum supply voltage (AC and battery) with minimum load

Transmission paths are tested for open and short circuit conditions.

The test establishes the series (partial open circuit – S_{FAULT}) or parallel (partial short circuit – P_{FAULT}) resistance at which the CIE indicates a fault condition.

At $0.9 \times S_{\text{FAULT}}$ or at $1.1 \times P_{\text{FAULT}}$, the voltage on the transmission path at the component must be within the supply limits specified for the component and the component must fully operate when placed into the fire alarm condition.