

PROTECTING A SCHOOL BUILDING

To protect a school complex with a fire detection and alarm system (FDAS), some preliminary analyses are necessary, contained and defined in the results of the assessment carried out in accordance with the regulations in force.

Particular attention must be paid to the evaluation of several aspects, including the location and entrances to the area, the fire resistance of the structures, the reactions of the materials to the fire, the compartmentalisation of the building, the crowding and outflow capacity through the escape routes (for example: stairs, number of exits, etc.).

Once the classification and attributions of the risk profile and the level of performance have been defined, the appropriate detection technologies are defined.

In a school building, during opening hours, there is a reception (or "caretaker's area") with the constant presence of staff dedicated to welcoming students. This environment is suitable for managing the alarm or fault signals detected by the FDAS control panel. It is also possible to transfer these signals to a second supervised location, such as the teachers' room or the caretaker, through a special management and control panel, which allows you to manage information in real time.

If the presence of personnel is not guaranteed by a 24-HOUR guard, such as the caretaker, the control panel be connected to an external alarm receiving centre (A.R.C.) certified according to EN 50518. Communications must be transferred with an EN 54-21 certified device directly connected to the FDAS control panel.

The fire alarm control panel (FACP) must be chosen according to the extension of the building, providing an adequate number of detection lines (Loops), based on their coverage and the number of detection devices needed. When, for example, the structure consists of several compartments or buildings, it may be necessary to provide several control panels connected in MASTER/SLAVE mode, using a special communication system.

In these structures, for fire protection, point-source smoke technology is normally used, which ensures excellent early detection. However, other technologies can also be used, such as linear optical detectors, ideal in areas with greater heights, such as gyms and corridors.

The air sampling detection systems, on the other hand, are suitable for large areas such as false ceilings of corridors and allow extremely effective monitoring of areas that are difficult to reach and accessible. This choice will have less economic impact on the mandatory testing activities defined by the reference standard.

For other more critical areas, such as thermal power plants, kitchens or environments where flammable materials are handled by students for teaching activities, more specific technologies must be used, especially in the presence of dust. For these categories of areas to be protected, the use of thermal-source detectors, flame detectors or detectors with a higher degree of IP protection must be provided.

The entire building must be equipped with manual signalling buttons positioned on all escape routes. Depending on the results of the risk assessment, the maximum route to reach the escape routes must not exceed 15 or 30 metres.

For the acoustic signal, adequate coverage must be provided with devices capable of emitting a sound level at least 5 dB higher than the background noise. In this sense, the use of sirens is suggested to ensure the effectiveness of signalling in any environment. The acoustic signals must comply with the reference standard.

In addition, it is recommended to also equip the smoke detectors with integrated audible warning devices, especially inside classrooms, to ensure a homogeneous distribution of the alarm signal.

If the FDAS system must be interfaced with a smoke and heat evacuation system, it must also be designed in compliance with the reference standards.

In the event of the presence of fire doors aimed at restoring the compartments, these must be equipped with retaining electromagnets and subservient to the FDAS, to be closed in the event of a fire alarm, in compliance with the cause-effect matrix or the operating logic of the system.

In very large school centres - and with a large number of students - depending on the risk analysis, in addition to the FDAS system, it may be necessary to design a voice alarm system (VAS) using EN 54-16 certified products for the control panel and EN 54-24 for the loudspeakers. The design of these systems must follow EN 54-32 standards. This must be interfaced to the FDAS system two-way.

In the event the FDAS system activates the voice alarm, the optical-acoustic signals must be deactivated to avoid overlapping acoustic frequencies, with the aim of achieving maximum intelligibility of the voice message.

If air conditioning channels are provided, check for the presence of fire dampers. If present, these must be interfaced to the FDAS system. The air handling units (AHU) must also be equipped with a duct detector and automatically blocked in the event of a fire alarm.

An adequate number of additional power supply units certified EN54-4 must be provided in order to comply, in the event of a lack of primary power supply, with reaching a service autonomy equal to or greater than 24 hours. These power supply units must be dimensioned to serve any linear optical detectors, extraction systems, optical-acoustic signals, electromagnets, smoke and heat evacuation systems, etc. For smoke evacuation systems, the power supply units must also be certified according to EN 12101-10.

The formal delivery of the system and the subsequent checks must be carried out in compliance with regulations in force.