

PROTECTING AN INDUSTRIAL SITE

Industrial sites are highly diversified structures, each with its own characteristics, which depend on the relevant production sectors. Some preliminary analyses must be carried out, contained and defined on the results of the evaluation carried out according to regulations in force, using CPR certified equipment, in accordance with product standards EN 54.

The choice of fire detection control panel (FACP) depends on the extension of the building, providing an adequate number of detection lines (Loops) based on the dimensions and the necessary detection devices. For structures divided into several compartments or buildings, it may be necessary to provide control panels connected in MASTER/SLAVE mode, using specific means of communication, such as copper or fibre optic.

Particular attention will be paid to the possible presence of a 24-HOUR guard. In the event the control panel is not under constant surveillance, an alarm and fault transmission system must be provided, certified according to EN 54-21 and connected to an alarm receiving centre (A.R.C.) certified according to EN 50518.

The type of system will depend on the classification of the industrial activity: a manual fire detection system (for example, performance level II, according to table S.7-2 of the Ministerial Decree on 3 August 2015) or an automatic detection system (levels III or IV, according to the same table). For systems in levels III or IV, it will be necessary to choose the most suitable automatic detection technology, considering the characteristics of industrial environments, which can vary considerably even within the same site.

The choice of detection technology must take into account geometries and dimensions, such as ducts, lighting and overhead cranes. In this case, the detection technology must be dimensioned according to current UNI 9795 guidelines. In addition, design must facilitate maintenance operations, as required by current regulations.

For environments with large spaces and few obstacles, the use of linear detectors, such as reflex light barriers or those with transmitter and receiver, can be considered. Each linear detector protects a maximum surface area of 1600 m² and can be used up to a height of 12 m.

In environments above this height, linear optical detectors must be used at intermediate heights or, if approved by the manufacturer, they can be used at a higher height.

In cases where the structures are characterised by articulated covers or by elements that hinder the installation of linear detectors, extraction smoke detection systems must be used. These systems offer capillary coverage and the possibility to choose between different sensitivity classes, according to what is indicated by the rules. For environments over 12 m high, a system with sensitivity class A is required. Each extraction system can protect an area up to 1600 m² with a maximum of 32 sampling holes, each with a coverage radius equivalent to a point-source smoke detector.

In the food sector, particular attention should be paid to processes that could produce steam or require frequent washing. In such cases, it is advisable to use thermal detectors in watertight containers, selecting sensitivity according to the regulatory tables.

In addition to automatic detection, it will be necessary to correctly distribute the manual signalling buttons by positioning them on all the escape routes and evaluating the maximum routes to reach the buttons themselves. These must not exceed 15 or 30 metres, in relation to what emerged from the risk assessment.

Another crucial element concerns the dimensioning of optical and acoustic signals. An adequate number of warning devices must be provided to ensure a sound level of at least 65 decibels (dB) and 5 dB above background noise. In environments with hearing protectors, VAD (Visual and Alarm Devices) systems must be integrated to ensure the perception of the alarm by means of flashing lights, in accordance with the indications of UNI 9795. The acoustic signals must emit tones that comply with standards.

The FDAS system must be interfaced with the smoke and heat evacuation system, also designed following the relevant reference standards.

With fire doors present, aimed at restoring the compartments, these must be equipped with retaining electromagnets and serviced by the FDAS for closure in the event of a fire alarm, in compliance with the cause-effect matrix or operating logic of the system.

In premises intended for offices, changing rooms, canteens and other service environments, the FDAS must be extended, using point-source smoke or thermal detectors to protect the premises and false ceilings, if present. For spaces that are difficult to inspect, such as false ceilings and sub-floors, the use of extraction systems, dimensioned according to standards, is recommended.

Attention should also be paid to any air conditioning systems for personal well-being. In these cases, the presence of fire dampers inside the air conveyance channels must be checked and they must be interfaced to the FDAS system. The air handling units (AHU) must also be equipped with a duct detector and blocked in the event of a fire alarm.

An adequate number of additional power supply units certified EN 54-4 must be provided 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, acoustic optical signals, electromagnets, smoke and heat evacuation systems, etc. In the specific case of smoke and heat 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.