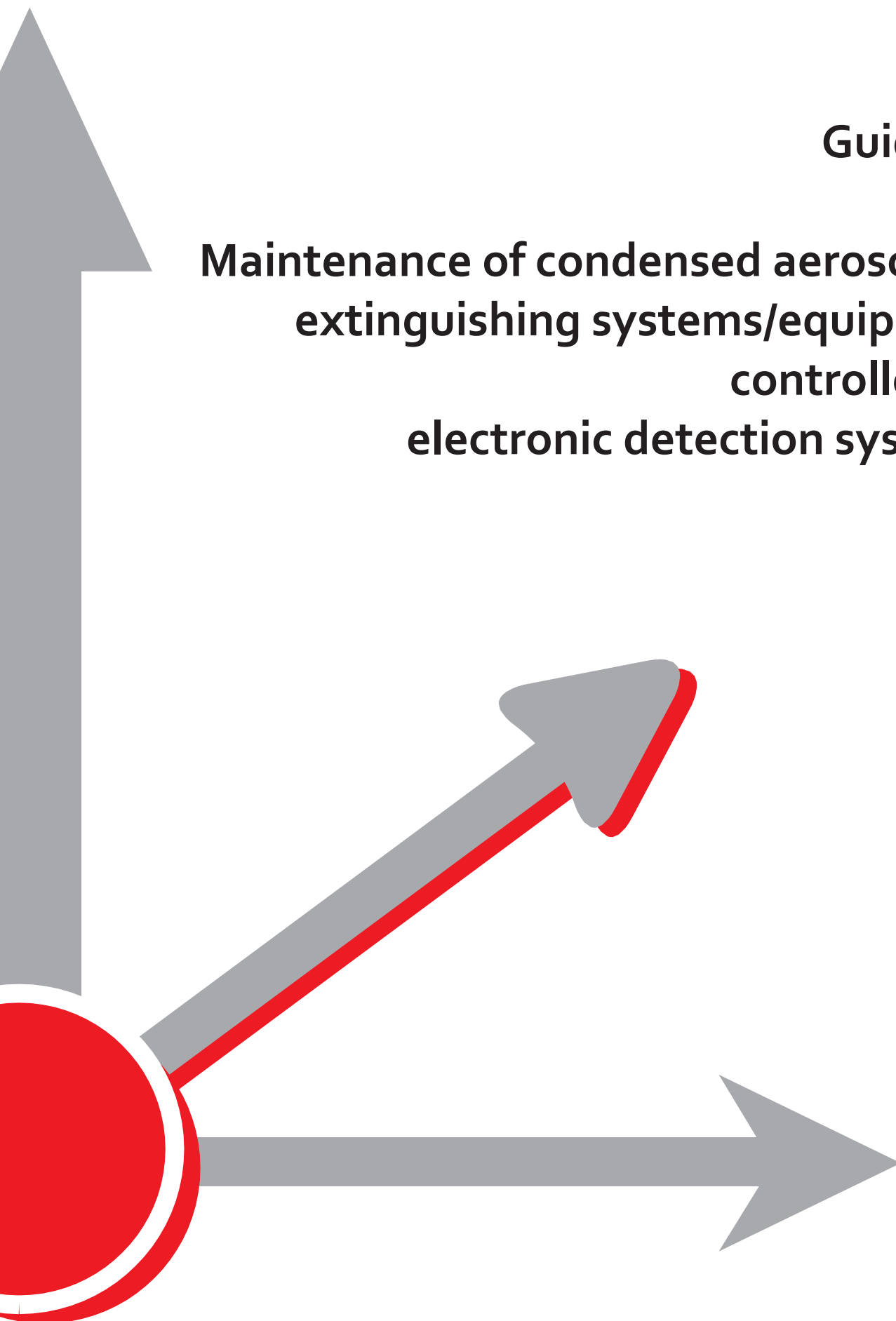


Guidance

**Maintenance of condensed aerosol fire
extinguishing systems/equipment
controlled by
electronic detection systems**



Revision table

Date	Rev #	Paragraph/ Page	Change
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FOREWORD

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Euralarm • Gubelstrasse 11 • CH-6300 Zug • Switzerland

E: secretariat@euralarm.org

W: www.euralarm.org

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1 INTRODUCTION

The aim of this paper is to make all users having a condensed aerosol fire extinguishing system in their premises or users planning to install one, aware of the importance of maintenance and continuous preventative measures for the constant performance and availability of the systems in case of fires. The correct performance of extinguishing systems is essential to quickly extinguish a fire and protect human life.

This document **specifically covers condensed aerosol fire extinguishing systems**, but the content may also be applicable to other fire extinguishing or fire prevention systems.

2 WHAT IS AN AUTOMATIC CONDENSED AEROSOL FIRE EXTINGUISHING INSTALLATION FOR?

Any automatic condensed aerosol fire extinguishing installation has the role of extinguishing a fire at an early stage in its development to safeguard, property, people and business continuity. Systems are controlled by means of an automatic fire detection system designed to detect a fire early and release the extinguishing agent before the fire can get out of control.

Condensed aerosol fire extinguishing systems are a very effective way to protect critical hazards, in normally unoccupied and unoccupiable spaces, where potential water damage from water-based systems would be a concern. They are suitable for rooms, not perfectly sealed and with limited space. Also, when modular system configuration and easy, cost-effective installation and maintenance are required. Typical applications include electric power generating and distribution facilities, electrical panels, machinery spaces, storage rooms, battery energy storage systems and mobile and transportable equipment.

3 WHAT IS MAINTENANCE?

According to the only European standard describing terminology of the term maintenance (EN 13306:2018), **MAINTENANCE** is defined as follows (figure 1):

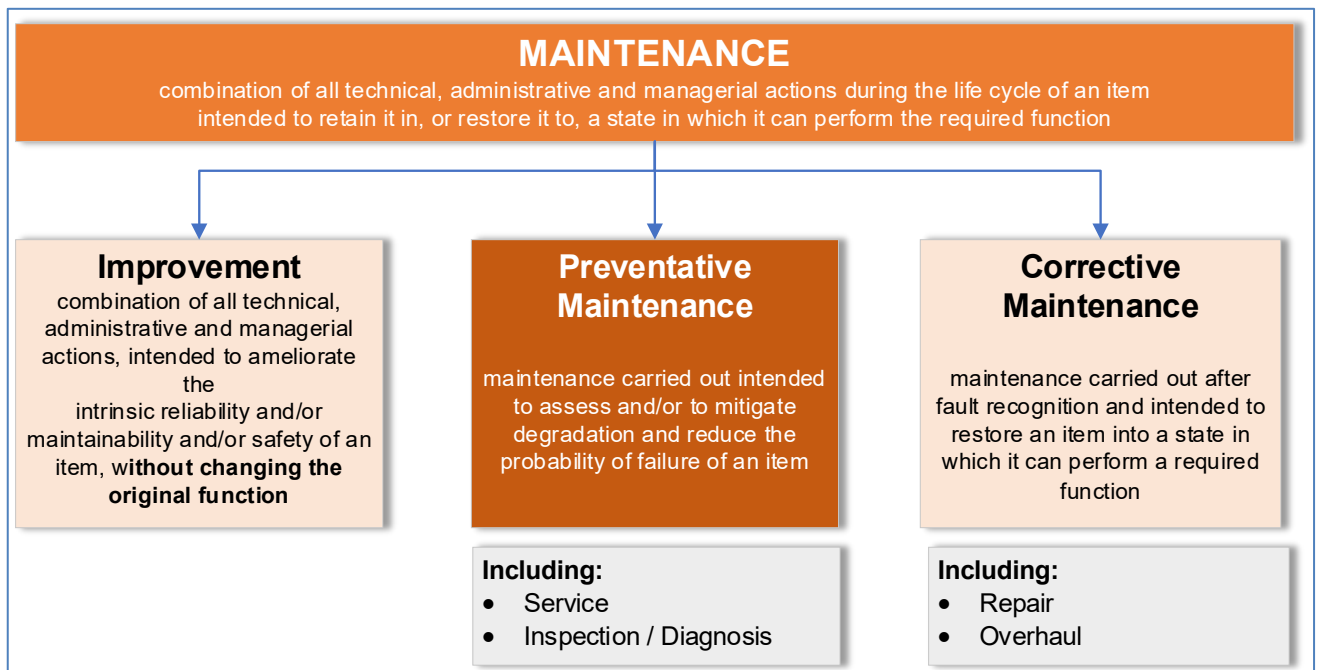


Figure 1: Maintenance terminology according to EN 13306:2018

It is important to conceptually separate maintenance into “**preventative**” and “**corrective**” measures. The term “**preventative maintenance**” includes all measures that are taken preventively and before a malfunction / error becomes apparent in order to avoid unwanted system malfunctions or failures. This is what this document is concentrating on.

4 WHY MAINTAIN AN EXTINGUISHING SYSTEM INSTALLATION?

Unlike a production tool, a fire protection system is on operational standby and is only activated in the event of a fire. Some faults may appear without being detectable by a non-specialist operator. **This is why it is necessary to carry out regular maintenance visits by specialists to confirm the level of performance of the installation by visual inspections and functional tests.**

Beyond technical verification of the correct functioning of the system, maintenance must also include:

- Preventative replacement of critical components that may degrade over time.
- Adapting the extinguishing installation to changes in risks and protected premises.
- Keeping the extinguishing installation in conformity with the rules/standards/regulations in force.
- Advice to end-users about retrospective improvements which are either mandatory or recommended.
- Checking the tightness of the protected enclosure to ensure it is capable of retaining the extinguishing agent for a specified period of time, normally at least 10 minutes.

It is the responsibility of the user/owner to ensure the safety of staff, but also of equipment for business sustainability. However, visual inspection and maintenance by users isn't sufficient – there must be inspection and maintenance by professional contractors (see [chapter 5](#)), because, by entrusting this service to a specialist, users/owners are ensuring the correct level of competence is applied to the system, while remaining focused on their business.

5 WHO SHOULD MAINTAIN AN EXTINGUISHING INSTALLATION?

In the planning, design, installation, commissioning, inspection, system verification and handover of a fire extinguishing systems, a third-party-approved installer company will ensure that the relevant guidelines for planning and installation as well as national and international regulations and standards are adhered to. Conformity with these standards is confirmed by means of an installation certificate. Approved installer companies also offer regular maintenance of fire extinguishing systems according to applicable regulation and standards.

What are the responsibilities of an owner/user of such system?

The user/owner is responsible for a general awareness of issues in the premises that may affect the correct operation of the extinguishing system. They are responsible for carrying out the following functions (some or all of the following functions may be delegated by contract to a third party (*such as a specialist installation or servicing company*):

- Laying down procedures for dealing with alarms, warnings and other events originating from the system.
- Training of people who are authorized to operate the system.
- Induction of all persons entering or likely to enter the protected space.
- Taking adequate measures to prevent inadvertent activation of the system by cutting, welding, sawing, smoking, heating, cooking, exhaust fumes, etc.
- Ensuring that the system is suitably modified if any significant changes of use or configuration of the building occur. Inform the maintenance contractor about all changes in the protected premises and in case a new risk assessment is needed.
- Keeping a logbook, and recording all events affecting the system.
- Ensuring that maintenance is carried out at the appropriate intervals.
- Ensuring that the system is properly serviced after the occurrence of a fault, fire, or other event which might adversely affect the system.
- To have a valid and current contract with a company fulfilling all criteria for maintenance companies (see next paragraph).

In addition, the user should perform regular visual controls of the system, described in [chapter 6](#).

What are the criteria for selecting a maintenance company?

- It has the necessary certifications / qualifications and authorizations. This may include the need for specific training by manufacturers.
- It has sufficient personnel to fulfil its obligations.
- The company and the personnel have the skills to maintain the equipment.
- It has access to the spare parts and special tools necessary for the maintenance of the equipment.
- It has appropriate levels of insurance covering the work / services to be carried out.

Why should a contracted maintenance company be certified?

Holders of such certifications are capable to perform all services mentioned before and it can generally be assumed that they meet the aforementioned criteria.

Which certification schemes for maintenance companies are currently available in Europe?

Third-party certification of maintenance services on extinguishing systems are available through several European certification bodies, examples may include (in alphabetical order):

Certification body	Certification based on
BAFE (UK)	SP 203-1 Design, Installation, Commissioning and Maintenance of Fire Detection and Fire Alarm Systems Scheme
	SP 203-3 Design, Installation, Commissioning and Maintenance of Fixed Gaseous Fire Extinguishing Systems Scheme
BRE (UK)	LPS 1204 Requirements for firms engaged in the design installation, commissioning and servicing of gas extinguishing & condensed aerosol systems - issue 3.2. / 2021
	LPS 1014 Requirements for certificated fire detection and alarm systems firms - issue 5.4 / 2020
CNPP (FR)	APSAD IF13 INSTALLATION/MAINTENANCE DE SYSTEMES EAG - Juin 2022
DBI (DK)	DBI-Guidance 001 APPROVAL OF INSTALLATION COMPANIES" - 5 th edition May 2021
VdS (DE)	VdS 2132 VdS Guidelines for the Approval of Installer Companies of Fire Extinguishing Systems - issue 2017/07
KIWA (NL)	BRL K23003-02 Process Certification Scheme for fixed fire extinguishing systems based on non-pressurized condensed aerosol generators – issue Jan. 2019

6 WHAT OPERATIONS ARE RECOMMENDED IN MAINTAINING CONDENSED AEROSOL FIRE EXTINGUISHING SYSTEMS?

NOTE: In accordance with the European legislation, the requirements of Inspection and Maintenance are reserved to the national body of rules and regulations of each EU Member State.

6.1 Operations to be carried out by users/owners

The user shall carry out a programme of inspection, arrange a service schedule, and keep records of the inspections and servicing. The user shall carry out a programme of inspection, arrange a service schedule, and keep records of the inspections and servicing¹.

NOTE: The continued capability for effective performance of a fire extinguishing system depends on fully adequate service procedures with, where possible, periodic testing.

These controls consist especially of checking (visually):

- The state of all components.
- The discharge path of the condensed aerosol generators is not obstructed.
- The state of electrical wiring.
- The system is on, in its correct mode of operation and not displaying any faults.
- That the condensed aerosol generators are within their certified lifetime.
- That control panels are in standby condition.
- That the integrity of the protected enclosure is maintained.
- Any pressure-relief vents are free to open and are not obstructed.
- That all personnel who may have to operate the equipment or system are properly trained and authorized to do so and, in particular, that new employees have been instructed in its use (monthly).

These operations are recommended to be achieved at least weekly/monthly² and more frequently if construction works are in progress.

6.2 Operations to be carried out by “Professionals”

Unless there are different requirements in applicable standards, at least 2 maintenance visits³ per year are recommended.

I. Examination of operating documents

- Instructions for use and operation.
- Logbook or safety register.
- Technical file.
- System certification (if existing or if required).

II. Training/Education

- Education of users and owners.
- Frequent training on the system installed on-site.

III. Visual inspection of the installation and components

- Compatibility of the extinguishing agent with the nature of the risk (equipment and materials stored).
- Condition of wiring, panels, sound and visual signalling devices.
- Structure of protected enclosure.
- Condensed aerosol generators are undamaged, securely mounted, free from corrosion, having their discharge path unobstructed and being within their certified lifetime.

¹ See EN 15276-2:2019 Chapter 11.

² Frequency of inspection by user might be regulated differently by local/national rules.

³ National regulations may differ.

IV. Functional tests of the installation

- Extinguishing cycle tests by sector or zone (using simulation test equipment while having the actuators disconnected).
- Verification of the signalling of information to the remote alarm receiving centre, service company or locally, as required.
- Verification of the control of the triggering devices (measurement of the ohmic resistance of the actuators)
- Verification of the audibility of the audible evacuation alarms and the visibility of the illuminated signs / beacons.
- Testing of the servo-controlled functions (air conditioning cut-off, closing of valves and doors, remote control, etc.) according to a procedure to be defined with the end user.
- Power supply control.
- Assess the integrity of the enclosure annually as per clause 6.3.2 of EN 15276-2:2019.

V. Inspection and test of connection to remote alarm receiving centre service company or locally, as required

NOTE: A suitable schedule for procedures for verification of the system should fulfil the requirements of EN-15276-2:2019 clause 11.

7 SUPPORTING DOCUMENTS

No.	Document
1.	EN 13306 :2018 - Maintenance — Maintenance Terminology
2.	EN 15276-2:2019 Fixed firefighting systems. Condensed aerosol extinguishing systems Design, installation and maintenance
3.	ISO 15779:2011 Condensed aerosol fire extinguishing systems — Requirements and test methods for components and system design, installation and maintenance — General requirements
4.	KIWA BRL-K23003-2 Fire Extinguishing Systems based on Dry Aerosol The K23003 describes the processes with regard to supplying of the basic- and detailed design, installation and the maintenance of fixed fire-extinguishing systems based on condensed dry aerosol for structures and compartments.
5.	NFPA 2010 Edition 2020 Standard for Fixed Aerosol Fire-Extinguishing Systems

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euralarm

Euralarm
Gubelstrasse 22
CH-6301 Zug (Switzerland)

Swiss Commercial Registration No: CHE-222.522.503

E secretariat@euralarm.org

W www.euralarm.org

