

THERMAL AEROSOL FIRE EXTINGUISHING DEVICE

*TECHNICAL SPECIFICATION, INSTALLATION,
OPERATION & SAFETY MANUAL*



Presented by Engineering

Technical Team

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PRODUCT OVERVIEW

Compact Fire Suppression Solution for Equipment

The TAF-series thermally activated condensing aerosol fire extinguishing system is designed to extinguish initial fires in small, enclosed spaces. It ensures rapid response through automatic thermal activation and requires very little maintenance.

This device is ideal for applications such as electrical cabinets and battery enclosures, providing localized protection without the need for external piping or stored pressure, making it highly efficient in compact installations.



10-40G MODEL SELECTION GUIDE

Choose the correct model by protected enclosure volume

MODEL	AGENT	PROTECTED VOLUME
TAF-10	10 g	Up to 0.10 m ³
TAF-20	20 g	Up to 0.20 m ³
TAF-30	30 g	Up to 0.30 m ³
TAF-40	40 g	Up to 0.40 m ³

HOW TO SELECT

Required Agent Weight = Protected Volume × 100 g/m³

Measure the enclosure's internal volume. If the result falls between two sizes, choose the next larger model.



TECHNICAL SPECIFICATIONS

Key details of the fire extinguishing device

Product Name	TAF-series
Fire extinguishing agent weight	10 g ± 1 g
Recommended fire extinguishing density	100 g/m ³
Protect volume	0.10 m ³
External dimensions	78 × 51 × 29 mm
Total weight	75g
Start-up temperature	≥170°C
Discharge time	≤6 s
Operating temperature	–50°C to +110°C
Service life	10 years

WORKING MECHANISMS

Understanding the chemical processes involved

1. Fire Suppression Mechanism

The fire suppression effect of the S-type condensed aerosol extinguishing agent is mainly achieved through the following mechanisms.

Conventional fire extinguishing mechanisms generally include isolation, smothering, cooling and chemical inhibition. Different extinguishing agents operate through different mechanisms.

The condensed aerosol extinguishing agent mainly suppresses fire through two mechanisms:

1. Cooling through endothermic decomposition
2. Chemical inhibition in both the gas phase and solid phase

These mechanisms work together to suppress combustion. In addition, the gaseous components generated by the aerosol extinguishing agent provide a supplementary smothering effect.

2. Cooling Through Endothermic Decomposition

The cooling effect of the condensed aerosol extinguishing agent mainly results from the endothermic decomposition of metal oxides and carbonates. The amount of heat released by a fire within a short period of time is limited. When the solid aerosol particles absorb part of this heat, the flame temperature decreases.

As a result, less heat is transferred back to the burning surface, and less energy is available to break vaporized combustible molecules into free radicals. This reduces the combustion reaction rate and helps suppress the fire.

WORKING MECHANISMS

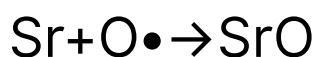
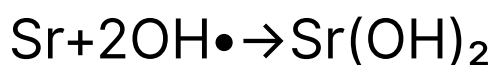
Understanding the chemical processes involved

2.1 Gas-Phase Chemical Inhibition

Under high-temperature conditions, vaporized metal species such as Sr, K and Mg, as well as positively charged metal ions, are released from the aerosol extinguishing agent.

These particles react repeatedly with highly active combustion radicals such as $\text{H}\bullet$, $\text{OH}\bullet$ and $\text{O}\bullet$, thereby interrupting the combustion chain reaction.

Using strontium as an example:



Through these repeated reactions, large quantities of active radicals are consumed. Their concentration continuously decreases, thereby suppressing the combustion process.

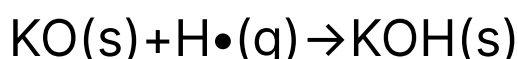
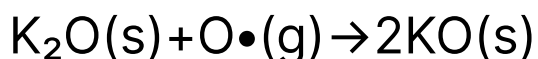
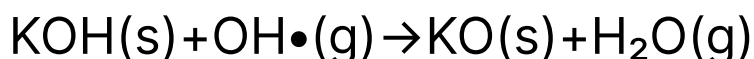
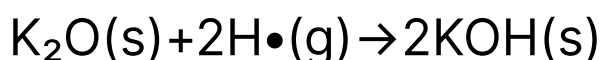
WORKING MECHANISMS

Understanding the chemical processes involved

2.3 Solid-Phase Chemical Inhibition

The fine solid particles contained in the condensed aerosol can adsorb chain-reaction intermediates such as OH•, H• and O•. These particles also catalyze the recombination of active radicals into stable molecules, interrupting the branching chain reactions involved in combustion.

Using potassium compounds as an example:



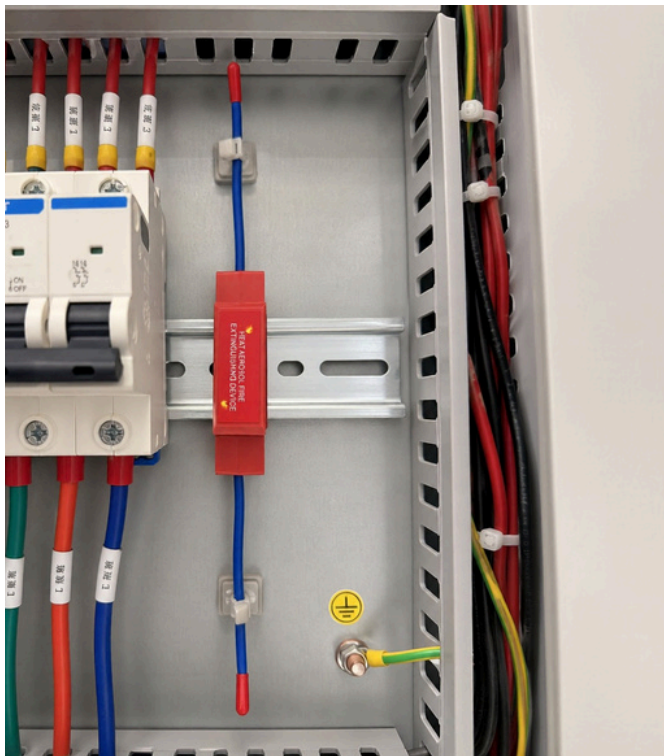
The above fire suppression mechanisms interact with and complement one another.

The transportation effect of the gaseous components and the cooling effect caused by the endothermic decomposition of metal oxides or carbonates provide supplementary assistance. The primary fire suppression effect is achieved through chemical inhibition in both the gas phase and solid phase.

INSTALLATION

Step-by-Step Guide

This section outlines the **step-by-step installation** process for the 10G-40G Heat-Activated Condensed Aerosol Fire Extinguishing Device. Each phase emphasizes important actions that should be taken in a systematic manner to ensure proper installation and operational safety. Clear identifiers for each phase facilitate a logical flow, making it easy for trained personnel to follow the installation guidelines efficiently and effectively.



Phase 1

Isolate the Equipment

Phase 2

Calculate the Protected Volume

Phase 3

Select the Mounting Position

Phase 4

Installing the Equipment

Phase 5

Final Inspection

Phase 6

Done

INSTALLATION

Planning and Requirements

Step 1 — Isolate the Equipment

Disconnect the power supply and confirm that the protected equipment is de-energized before installation.

Step 2 — Calculate the Protected Volume

Measure the internal volume of the enclosure. One TAF-10 device is recommended for a reasonably enclosed space of up to 0.10 m³ under the specified extinguishing density.

Step 3 — Select the Mounting Position

Install the device near the upper area of the enclosure and close to the most likely ignition source. The discharge outlet must face an open internal area.

Step 4 — Installing the Equipment

Method 1: The product has a 35mm DIN rail on the bottom; simply install it directly onto the rail.

Method 2: Peel off the protective film from the adhesive backing, place the equipment correctly, and press it firmly onto the mounting surface.

Step 5 — Final Inspection

Confirm that the equipment is securely installed and that the installation date has been recorded to prevent moisture damage.



SAFETY WARNINGS

- Installation and inspection must be carried out by trained personnel.
- Do not dismantle, drill, cut, bend or modify the device.
- Do not expose the device to open flame, welding sparks or abnormal heat during installation.
- Keep the discharge outlet unobstructed.
- Do not touch the device immediately after activation. Allow it to cool completely before handling.
- Disconnect electrical power before inspecting the protected equipment after a discharge.
- The device is single-use and must be replaced after activation.
- Do not use the product in open or heavily ventilated spaces.
- The product does not replace the building's required fire alarm or fixed fire protection system.
- Keep away from unauthorized personnel and children.