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Selecting the Correct Portable Fire Extinguishers for Data Centers Helps Prevent Collateral Damage to Critical Operations

Data centers are facilities that house computers, servers, data storage devices, and other general networking equipment. Most businesses and government agencies rely on their data centers to support critical operations, including executing transactions and storing data. They need to remain reliable and continuously operational with minimal interruptions. Organizations go to great lengths to prevent or minimize interruptions in operations. This includes investing in special air conditioning equipment to keep IT (information technology) equipment from overheating, backup batteries used during power loss, and extra fire protection equipment to support business continuity.

Fire protection for data centers includes installing strategically located special fire extinguishers that support an immediate response to incipient fires without causing collateral damage. Special considerations are necessary for selecting and placing extinguishers for data centers. Here is the information you need to help ensure your customers have the most appropriate portable fire extinguishers to protect their data centers.

Extinguishers for Data Centers

A review of the portable extinguisher requirements in NFPA 75, Standard for the Fire Protection of Information Technology Equipment reveals that either carbon dioxide or halogenated agent extinguishers are necessary for the protection of this electronic equipment [75, 9.3.1]. There is also a prohibition of the installation of dry chemical extinguishers for these spaces [75, 9.3.2]. Dry chemical fire extinguishers are for the protection of most other buildings. But dry chemical is not appropriate for the protection of spaces with electronic equipment, like data centers, as they can cause collateral damage.

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Selecting the Correct Portable Fire Extinguishers for Data Centers Helps Prevent Collateral Damage to Critical Operations Cont'd

Another provision says that the installed listed extinguishers intended for use on combustible materials (paper and plastics) must have a minimum rating of 2-A [75, 9.3.2]. If you install carbon dioxide extinguishers, they are "supplemental protection" since those extinguishers do not have a Class A rating. Typically, data centers have common combustibles, so the clean agent extinguishers installed for compliance with NFPA 75 must have a minimum rating of 2-A. Normally a halogenated agent with at least 15 lbs. of agent gets a 2-A rating. In addition, data centers that have large server rooms with rows of server racks need many clean agent extinguishers.

IT Support Rooms

The minimum placement criteria for extinguishers are easily met for a small server room that is the size of a large closet. But for larger facilities, it becomes more complicated. In addition to server rooms, there are also NOCs (Network Operations Centers) to monitor and manage networks, SOCs (Security Operations Centers) for monitoring and responding to cyber threats, and Auxiliary Support Rooms (ASRs) for supporting the smooth operation of servers and data storage equipment. All server rooms and support spaces need portable fire extinguishers that comply with the minimum requirements of NFPA 75.

Required and Supplemental Extinguishers

NFPA 75 is the occupancy standard that requires the installation of clean agent extinguishers. NFPA 10, *Standard for Portable Fire Extinguishers* provides the distribution criteria. Regarding NFPA 10, the maximum travel distance from any point to an extinguisher for Class A Hazards is 75 ft [10, 6.2.1.2.2]. Extinguishers for protecting NOCs, SOCs, and ASRs are provided for the protection of those spaces. It is optimal to install additional extinguishers in those staffed locations for server, data storage, networking, or battery fires that could occur elsewhere. That way a person can grab an extinguisher or two before responding to a fire signal or notification of a fire emergency in another area.

Clean Agent Extinguishers for Data Centers

Halogenated agents and carbon dioxide are clean agents, meaning they are electrically non-conducting and evaporate quickly, leaving no residue. Halogenated agents fall into two categories: Halon 1211 and halocarbons, such as Halotron® I.

1. NFPA 75, <u>Standard for the Fire Protection of Information</u> <u>Technology Equipment</u>, 2024 Edition

2. NFPA 10, Standard for Portable Fire Extinguishers, 2022 Edition

Both Halon 1211 and Halotron I extinguishers are typically selected to protect data centers and support rooms. Smaller Halotron I extinguishers are BC-rated, and larger ones are ABC-rated. Where a 2A-rated extinguisher is desirable or necessary for compliance with the local fire code, a halogenated agent extinguisher 15 lbs. or larger is typically needed to achieve the 2A rating. Where smaller BC-rated Halotron I extinguishers are installed, they are supplemental protection, since they don't have the 2A rating.

Carbon Dioxide is a colorless and odorless gas that is also electrically non-conductive. Carbon Dioxide extinguishers are BC-rated. The "C" rating means they are compatible with energized electrical equipment. Carbon dioxide extinguishers do not achieve an A-rating. However, since they can smother a fire by diluting the oxygen in the air, they are effective in extinguishment of Class A fires (common combustibles). Carbon dioxide discharges from an extinguisher as a gas. Therefore, a user must be much closer to a fire than halogenated agents, which are streaming agents and have a longer "throw-distance".

Special Extinguisher Signage

Signs must be located adjacent to each fire extinguisher, and the wording must plainly indicate the type of fire used for each extinguisher [75, 9.3.3]. These signs are especially helpful in data centers where personnel are not necessarily experts in fire safety or where new employees have not had any fire-safety training.

Conclusion

Data centers should have a complement of clean agent portable fire extinguishers strategically installed for small fires for the intended safety of personnel and to protect equipment and prevent business interruptions. Fire equipment distributors with trained technicians are the best source for selecting and installing extinguishers so that data centers have the most appropriate layered fire protection to support their operations. •









Help Your Customers with Required Enhanced Communications Systems for Emergency Responders

The local fire department in your community must be able to communicate effectively by two-way radio from the outside of buildings to firefighters within buildings. But most buildings have "dead spots" caused by common building materials, including concrete, metal, and even Low-E glass windows, obstructing radio signals, impacting their two-way radio communications. When this occurs, it is difficult or impossible for firefighters to hear each other on their two-way radios. Another dead spot problem is communications to below-grade areas and basements.

Fortunately, there is a solution. This article is an introduction to Emergency Responder Communication Enhancement System (ERCES), installed throughout buildings to improve two-way radio communications. ERCES is a radio signal enhancement system that boosts signals for clear radio communications between firefighters during in-building emergency response operations.

What is the purpose of ERCES?

The purpose of ERCES is to increase signal strength and improve communication coverage for firefighters that must enter buildings to fight fires and perform emergency operations. When ERCES is designed and installed correctly, firefighter safety within buildings is significantly improved.

When is ERCES required?

According to NFPA, an in-building emergency responder communication enhancement system is required by the 2024 edition of NFPA 1, Fire Code, when the radio signal strength within 95 percent of the general floor area and 99 percent of critical floor area is not sufficient to provide a delivered audio quality of 3.0 or above¹.

Additionally, the International Building Code (IBC) and the International Fire Code (IFC) require ERCES for new and existing buildings with some exceptions. ERCES is required in all new and existing buildings where the minimum strength of emergency responder radio signals transmitted into and out of the building cannot be maintained.

"The local fire department in your community must be able to communicate effectively by two-way radio from the outside of buildings to firefighters within buildings."

What are the main components of ERCES?

A combination of components, RF-emitting devices, antennas, cables, power supplies, control circuitry, and programming are installed at a specific location to improve wireless communications within the building and between on-scene firefighters and their communications center.

How are radio signals transmitted and received in buildings?

An ERCES system typically includes a Distributed Antenna System (DAS). DAS is a network of cables and antennas installed throughout a building. The strategically placed antennas receive and then redistribute radio signals. The Directional Antenna is located at a high point within the building or on the roof. The DAS antenna faces a nearby Public Safety Antenna (tower), which receives and transmits RF radio signals.

How are the radio signals amplified?

The radio signals transmitted or received are amplified by a Bi-Directional 2-way Amplifier (BDA). The BDA is part of the ERCES system, which increases power and improves the quality of the signals. The amplified signals are then transmitted to poor signal areas of the building. The result is improved coverage, which ensures firefighters can communicate clearly and understand each other.

Is ERCES integrated into the fire alarm system?

ERCES and BDA are integrated into a building's fire alarm system, which allows trouble signals to be sent when a problem occurs. The fire alarm system monitors the ERCES and BDA equipment connected to it. When a problem is detected, a supervisory signal is sent to the fire alarm control panel (FACP) so that appropriate corrective actions can be taken.



Help Your Customers with Required Enhanced Communications Systems for Emergency Responders Cont'd

What is a frequency license holder?

A frequency license holder is the person or organization that has been granted permission by the Federal Communications Commission (FCC) to use a specific frequency. The FCC is the federal agency that grants legal permission for fire departments to operate a radio on a specific frequency. The license grants exclusive use of the frequency, which can help prevent interference and increase productivity.

What is a radio frequency system designer?

The RF system designer is an individual who has the knowledge, education, experience, training, and understands RF theory enough to design an in-building ERCES that complies with NFPA 1225, Standard for Emergency Services Communications, and the requirements of the FCC.

How does a fire alarm company break into the ERCES market?

Although ERCES is required by building and fire codes in most states, most fire alarm technicians do not understand the technology well. This niche market has many opportunities to install ERCES in new and existing buildings where these systems are required but not installed.

by Honeywell

PS700 Signal Booster

Brooks Customers have access to Honeywell Fiplex ERCES products with an Expert Customer Service Support Team. We are here to assist and make sure the ERCES systems you install will enhance signals for clear radio-communications between firefighters during in-building emergency response operations according to code. •

- ¹ https://www.nfpa.org/news-blogs-and-articles/blogs/2024/03/04/when-emergency-responder-communication-enhancement-systems-are-needed
- 2. NFPA 1, Fire Code, 2024 Edition
- 3. NFPA 1225, Standard for Emergency Services Communications, 2022 Edition



"Helping to Speed Up Emergency Response Time"

"Brooks Customers have access to Honeywell Fiplex ERCES products with an Expert Customer Service Support Team."

Required Annual Visual Inspection to Identify Problems and Help Ensure Reliable Protection for Your Customers

Sprinklers in an automatic sprinkler system are inspected from the floor level annually. These routine quick-check inspections are intended to address obvious problems with the sprinklers. These inspections reveal whether any of the sprinklers in the system need to be replaced. Whether you are new to sprinklers or need a refresher, here is what you need to know to ensure you perform these inspections correctly.

Floor Level Inspections of Sprinklers

Local or state fire codes require the annual floor level inspections, but the basis for these requirements is NFPA 25, Standard for the Inspections, Testing, and Maintenance of Water-Based Fire Protection systems. Section 5.2 of NFPA 25 addresses these annual visual inspections. As a minimum, the following are reasons that sprinklers are replaced.

- Leakage
- Corrosion
- Physical damage
- · Loss of fluid in the glass bulb
- Loading
- Paint (other than manufacturer-applied paint)
 Corrosion, loading, and paint can have a detrimental effect on performance.

Inspection Objective

The objective of the annual visual inspection is to identify problems or potential problems that can harm the sprinklers' performance. Once identified, those sprinklers are simply replaced with new ones. The result of not replacing sprinklers, when concerns are identified, is that they could adversely impact water distribution patterns, insulate thermal elements and delay operation, or otherwise render the sprinkler inoperable or ineffectual.

Sprinkler Deficiencies and Impairments

During an annual inspection, it is important to identify whether a sprinkler deficiency is critical or noncritical. NFPA 25 provides definitions and guidance to assist with this determination.

- A Critical Deficiency is a deficiency that, if not corrected, can have a material effect on the ability of the fire protection system or unit to function as intended in a fire event [25, 3.3.8.1].
- A Noncritical Deficiency is a deficiency that does not have a material effect on the ability of the fire protection system or unit to function in a fire event. Still, correction is needed to meet the requirements of NFPA 25 [25, 3.3.8.2].

Sprinkler Critical and Noncritical Deficiencies (NFPA 25 Annex)

Observation	Critical Deficiency	Noncritical Deficiency
Sprinkler is spraying or flowing water	X	
Sprinkler is slowing dripping water		Х
Foreign material is attached or suspended from sprinkler	x	X
Heavily loaded, corroded, or painted	Х	
Lightly or moderately loaded, corroded, or painted		x
Improper orientation	Х	
Glass bulb has lost fluid	Х	
Sprinkler is damaged	Х	
Sprinkler missing listed escutcheon*		Х

The type, amount, and location of foreign matter is evaluated to determine if it qualifies as a critical or noncritical deficiency.

*A listed escutcheon is tested and listed to perform as part of a sprinkler assembly. The escutcheon for a concealed sprinkler is the part of the sprinkler cup that surrounds the sprinkler and sits entirely within the ceiling (or wall) behind a cover plate. Where a listed escutcheon is missing and is no longer commercially available, the sprinkler assembly is replaced.





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TY579A30AP



TY523801002

Required Annual Visual Inspection to Identify Problems and Help Ensure Reliable Protection for Your Customers Cont'd

Corroded, Loaded, or Painted Sprinklers

Heavily corroded, loaded, or painted sprinklers are critical deficiencies. Here is a summary of corrosion, loading, or paint found on sprinklers and the adverse impact these problems will cause if the sprinklers are not replaced.

- Corrosion, loading, or paint found on the seat of the sprinkler could impact the release of the plug or adversely impact the proper discharge stream.
- Corrosion, loading, or paint buildup on the deflector could affect the spray pattern of the water discharging.
- Corrosion, loading, or paint found on the operating elements of the sprinkler could delay thermal response and the proper release of the operating elements.

All these conditions can have a detrimental effect on the performance of sprinklers or water distribution, so replacing the affected sprinklers is essential.

Concealed Sprinklers

Some pendent-type sprinklers have cover plates. Those sprinklers are called concealed sprinklers. The cover plates protect the sprinkler from the surroundings and do not need to be removed during the annual inspection. However, where cover plates show signs of leakage, damage, corrosion, or other abnormal conditions, they are removed for closer examination of the sprinkler.

Glass Bulb Sprinklers

Sprinklers with glass bulbs sometimes experience a loss of color due to exposure to sunlight or when installed in cold environments. The color change in the bulb does not affect the operation or any other performance characteristics of the sprinkler. The sprinklers are replaced only where fluid is lost in the glass bulb.

"Visual Inspections Help Identify Problems to Ensure Reliable Protection"

Replacement Sprinklers

Replacement sprinklers should ideally be of the same make and model, but ensuring they have compatible performance characteristics with the sprinklers being replaced is important. Replacement sprinklers must have the right characteristics for the application intended, including the following:

- Style
- · Orifice size
- K-factor
- Temperature rating
- Coating (not all sprinklers have a coating)
- Deflector type (upright, pendent, or sidewall)
- Design requirements

Damaged, leaking, corroded, loaded, or painted sprinklers can adversely impact water distribution patterns, delay sprinkler operation, or render the sprinkler ineffectual or inoperable. It is critical that annual inspections are conducted, and sprinklers are replaced when problems are identified. Once the sprinklers are replaced and the system is operational, all sprinklers in the system will be capable of operating and discharging water as needed during a fire emergency. Reliability is returned, and people and property are protected from fire. •

1. NFPA 25, Standard for the Inspections, Testing, and Maintenance of Water-Based Fire Protection Systems, 2023 Edition

Meet Mike Cox, Territory Account Manager

Since joining Brooks in February 2014 in Charlotte, Mike Cox has been a key player in building customer relationships and driving new businesses. Previously, a Mortgage Loan Officer at Wells Fargo, he transitioned to sales, bringing strong communication and leadership skills.

As a Territory Account Manager, Mike travels to strengthen customer connections, seeks new opportunities, and mentors other Account Managers on "The Brooks Way." He enjoys the variety his role offers, making each day different from the last.

His personal mantra? "Seize the Day." Outside of work, he loves hunting and spending time with family. His favorite getaway? The Caribbean. When it comes to food, he can't resist chocolate and pizza.

Mike's top career lesson: "Ask questions and stay the course." His dedication to learning and adaptability make him an invaluable part of the Brooks team. ◆





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More Portable Fire Extinguishers are Being Installed at Military Bases

You probably know that portable fire extinguishers were removed from a few military bases just a few years ago. Then, in 2021, extinguishers were suddenly reinstalled at those same bases. More extinguishers will likely be reinstalled throughout most military facilities in the coming months. This article will help you and your customers at military bases understand why this phenomenon is occurring.

The changes in the military's approach to fire protection, specifically the reinstallation of portable fire extinguishers, are due to changes in federal law. The National Defense Authorization Act (NDAA) is a series of laws that are updated annually and specify the annual budget and expenditures of the US Department of Defense (DoD). In recent years, specific provisions in the NDAA have mandated the installation of portable fire extinguishers, which is why extinguishers are becoming more prevalent at military facilities.

This article summarizes the impact of the NDAA on the military's building code, the Unified Facilities Criteria (UFC). It also provides some interesting historical information on the updates to the UFC. Changes to the UFC are helping to make the safety of military bases equivalent to similar occupancies in civilian buildings.

The Unified Facilities Criteria (UFC) 3-600-01, Fire Protection Engineering for Facilities provides minimum requirements for fire protection systems and equipment, including portable fire extinguishers. The latest edition of the UFC was published May 6, 2021, superseding all previous editions and changes to the UFC.

A previous edition of the UFC had a requirement that stated: "9-17-1 General. General purpose portable fire extinguishers are not required when a Facility is provided with complete automatic sprinkler protection and a fire alarm system in accordance with this UFC."

With this provision in the UFC, many military bases were removing extinguishers through attrition, meaning an extinguisher removed for servicing, such as teardown inspection or hydrostatic test, was not returned to service. Military base extinguishers were beginning to disappear, and service members were becoming less safe.

That allowance for sprinklers in lieu of extinguishers was deleted with the May 2021 update of the UFC and replaced with the following requirement, which is the current requirement:

"9-17-1 General. General purpose portable fire extinguishers must be provided where required by NFPA 101."



This current wording in the UFC means that most occupancies are now required to have portable fire extinguishers installed throughout military bases for the protection of buildings/contents and safety of personnel. The following table provides a summary of where portable fire extinguishers are required by the current UFC (current edition of NFPA 101).

NFPA 101, Portable Fire Extinguishers

Occupancy Use	Extinguishers Required	
Ambulatory health care	Yes	
Assembly	Yes, but not seating and outdoors	
Business	Yes	
Detention and correctional	Yes, can be locked or in staff areas	
Health care	Yes	
Mercantile	Yes	
One and two-family dwelling	No	
Residential board and care	Yes	

The National Defense Authorization Act (NDAA), for Fiscal Year 2022, requires portable fire extinguishers to be installed at military facilities according to NFPA 1. The following table shows additional occupancies where extinguishers will be required once FY22 NDAA is implemented.

Additional Occupancies where Portable Fire Extinguishers are Required by NFPA 1, Fire Code

Occupancy Use	Extinguishers Required	
Apartment	Yes, building exterior mounting allowed	
Day-care	Yes	
Educational	Yes	
Hotel and dormitory	Yes	
Industrial	Yes	
Lodging and rooming house	Yes	
Storage	Yes, permitted on forklifts in lieu of NFPA 10 criteria	

The FY22 NDAA was signed into law in December of 2021. Although the NDAA became law, implementation has been delayed, and the UFC has not yet been updated.

The portable fire extinguisher criteria in the UFC will soon be replaced with the following criteria:

"9-17-1 General. General purpose portable fire extinguishers must be provided where required by NFPA 1."

Although implementation of the new portable fire extinguisher provisions of the NDAA is expected in 2025, the authority having jurisdiction (AHJ) of every military base is encouraged to review the intent of the law and consider using the latest edition of NFPA 1 for portable fire extinguisher installation requirements. NFPA 1 contains a higher level of safety for personnel and protection of assets.

When FY22 NDAA is finally implemented (probably later this year), military bases will be required to have a full complement of extinguishers installed with the most recent edition of NFPA 1, Fire Code. Once the UFC is updated and extinguishers are required to comply with NFPA 1, buildings on military bases will have the same level of extinguisher protection as their civilian counterparts and an equivalent level of safety. •

FY22 NDAA is the federal law that mandates an update to the UFC and the installation of portable fire extinguishers at military facilities.

Brooks Equipment maintains its direct involvement in driving these positive changes through its participation with the Fire Equipment Manufacturers' Association (FEMA) and the Government Relations Committee (GRC). Brooks' own Robert Bell is the current president of FEMA.



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