

Carbon Dioxide Suppression Systems Safety Upgrade



CARDOX

ARE YOU COMPLIANT?

The purpose of this brochure is to provide you the mechanical requirements needed for upgrading existing CO₂ systems to meet the revised NFPA Standard 12, 2011 Edition, which addresses personnel safety and reliability. These are mandatory upgrades for new and all existing systems that were required to be in compliance by December 31, 2008.

These changes implemented by the NFPA Standard 12, reflect a continuing effort to improve "life safety" features of both new and existing CO₂ fire extinguishing systems.

Kidde offers an array of Clean Agent and CO₂ product lines to provide a wide selection of gaseous agent fire protection options. When CO₂ is selected as the suitable agent, these safety devices need to be considered.

This information is not intended to take the place of a complete review of the NFPA Standard 12, 2011 Edition. The current edition should be consulted for all noted changes, exceptions and clarifications included in the standard, but not presented herein.

All existing CO₂ systems shall be upgraded by adding new signage and hazard lockout valves as a minimum. Further, for total flooding applications, pneumatic pre-discharge delays and sirens are required if hazard occupation is possible. Pneumatic pre-discharge sirens may be a good choice for local application systems where CO₂ concentrations exceed 7.5% or where personnel are exposed to unsafe CO₂ levels. If hazards are normally occupied rooms, a clean agent system may be a suitable alternative.

However, for high value areas that are not normally occupied, a CO₂ fire system may be a good choice.

Examples covered in the NFPA Standard 12 where CO₂ is suitable include:

- Where clean agent concentrations are above LOAEL or result in oxygen levels less than 8%.
- Where energized electrical equipment is >400 volts and have grouped cables.
- Where unclosable openings limit the ability to build concentrations or require extended discharge not offered by other agents.
- Marine cargo holds and some engine rooms.

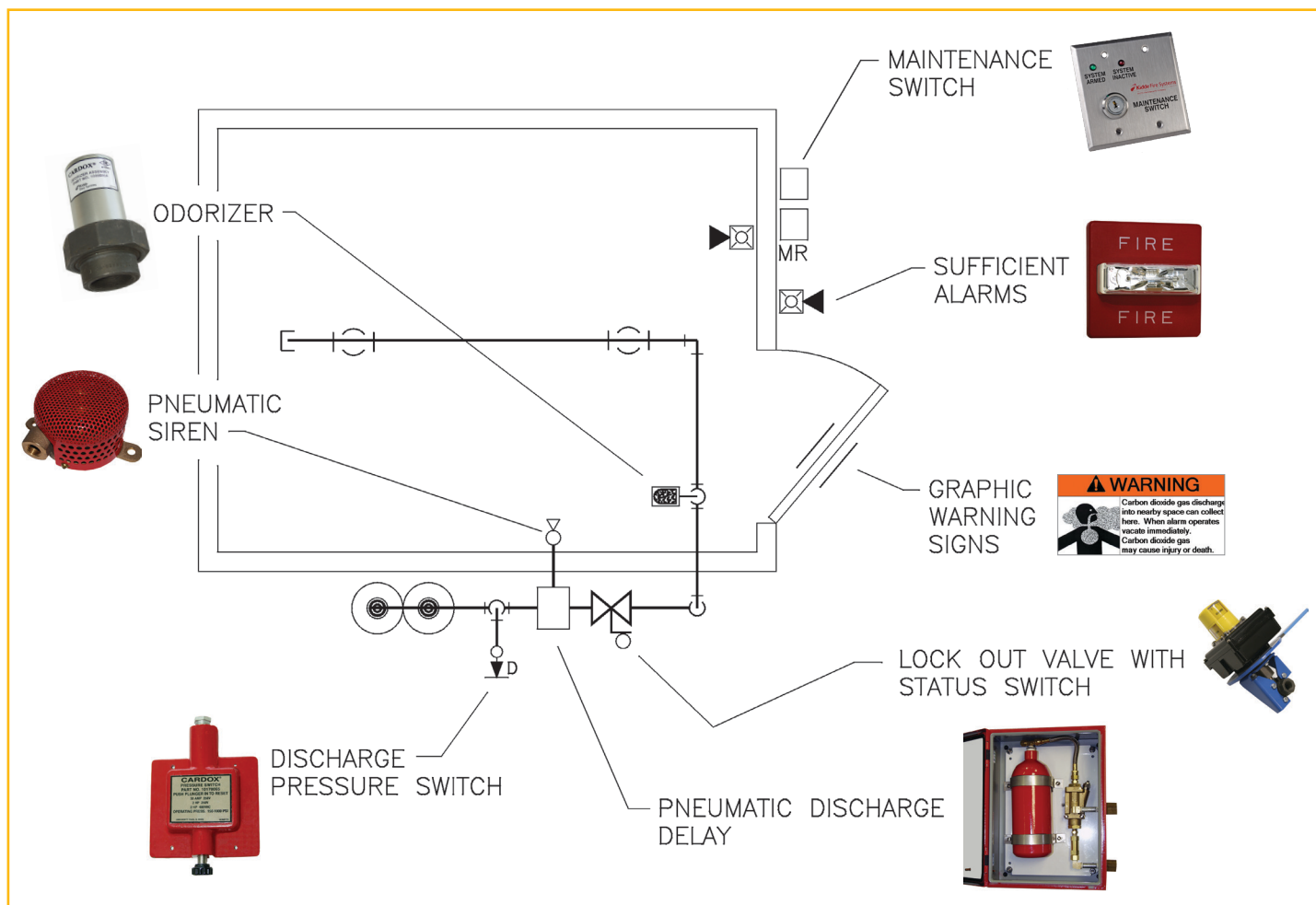
EXISTING INSTALLATIONS

Existing systems shall be upgraded to meet the requirements for graphic safety signs, lock-out valves, pneumatic time delays and pneumatic pre-discharge alarms where suitable.

The installation of graphic safety signs does not require any modifications to the system and should be completed immediately.

The addition of supervised lock-out valves, pneumatic pre-discharge alarms and pneumatic time delays may require that the system flow calculations be verified for proper system performance. That is, the additional equipment adds equivalent pipe length to the system. The pneumatic pre-discharge alarm requires carbon dioxide flow to sound. The revised design should be in accordance with the agent quantity requirements of the standard. These modifications could necessitate revisions to the pipe, the valves and/or the discharge nozzles.

UPGRADE ILLUSTRATION FOR HIGH PRESSURE CO₂



The following are the safety considerations required for new and existing systems:

LOCKOUT VALVES

For all new and existing CO₂ systems, manual lockout valves shall be provided, rare exceptions apply. Status switches for lockout valves shall report to the system control unit or building fire alarm panel. In a low-pressure system, the tank shutoff valve shall not be considered as a lockout valve, except where the tank supplies a single hazard or is protecting multiple interrelated hazards.

PRE-DISCHARGE ALARM AND TIME DELAY

A pneumatic pre-discharge time delay and pneumatic alarm shall be provided for the following enclosures:

- Most total flooding systems hazard spaces
- Local application systems which expose personnel to CO₂ concentrations in excess of 7.5% for longer than 5 minutes

OLFACTORY INDICATION

Addition of a distinctive odor to the discharging carbon dioxide serves as an indication that carbon dioxide gases are present. Personnel should be trained to recognize the odor and evacuate spaces where the odor is detected. Check for suitability of olfactory indication.

ALARMS

Provide automatic alarms at the entry to and within such spaces that are protected by carbon dioxide fire systems. Establish confined space entry procedures for CO₂ system lockout and enforce limited area access.

DISCHARGE PRESSURE SWITCH

A discharge pressure switch shall be installed between the carbon dioxide supply and the lockout valve. Activation of a pressure switch shall operate warning alarms.

MAINTENANCE SWITCH

A maintenance switch shall be wired into the solenoid release circuit to permit a means of electrically disabling the system. This meets the code requirement of a disconnect switch.

The current NFPA Standard 12 does not allow the use of Class 150 malleable iron fittings. All system upgrades should include the use of Class 300 or Class 600 fittings for the modified portion of the systems. Refer to the NFPA 12 standard for specific requirements pertaining to low pressure and high pressure applications.

OTHER CONSIDERATIONS FOR UPGRADES TO EXISTING CO₂ SYSTEMS

System Release Control Panels – Kidde offers conventional, addressable and multiple hazard control panels, all in conformance with UL 864 listings. Enclosure options: NEMA 1, as well as industry exclusive NEMA 4, and 12 are available.

ALTERNATE SUPPRESSOR OPTIONS

If safety concerns drive the decision for an alternate method of fire protection, Kidde offers these four gaseous agent systems for consideration. These options provide proven fire suppression qualities, are environmentally friendly and cause no adverse effects to equipment.

CLEAN AGENTS: FM-200 & Novec 1230

INERT GASES: Nitrogen & Argonite

WE CAN HELP!

We understand that staying on top of codes and being current with all of the regulatory requirements can be difficult and daunting. We are able and willing to leverage our knowledge and experience to help you navigate the compliance process.

Here are two ways that we can help you:

- You can call us for a packet of information about the current requirements so that you can assess your own needs on your own schedule.
- We can arrange to meet with you at the site facility to discuss current system status and provide a path to full compliance.

To arrange for a visit, to obtain additional information, to participate in a webinar or to simply speak with a knowledgeable and experienced professional, please contact one of our North American Regional Sales Managers:

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