



Linear Heat Detection (LHD) Application Bulletin

REFRIGERATED AND COLD STORAGE DETECTION

Refrigerated Storage Areas

When using ThermoCable™ as an initiating device for pre-action sprinkler systems in refrigerated storage areas, attention should be paid to the guidelines provided by Factory Mutual (FM). Guidelines can be found in FM Loss Prevention Data Sheets like 8-29. Generally, FM acceptance requires linear heat detection wire be installed at spacing not greater than that allowed for a ceiling sprinkler system. For this reason, when ceiling detection is required in a refrigerated storage application, the ceiling detection wire may be fastened to the sprinkler piping. Be sure to check with the AHJ when planning this type of installation.

When installing ThermoCable™ in conjunction with a sprinkler system in a rack system, FM guidelines must be followed along with manufactures recommendations. In the case of signal or double row racks, one line of ThermoCable™ is needed for each sprinkler level. The detection wire should be attached to the load beam at the sprinkler level and run in the transverse or longitudinal flue space. For multiple row racks, each sprinkler line would require a corresponding run of detection wire.

The following sections detail using ThermoCable™ in a variety of rack storage systems including open rack with and without sprinkler protection and refrigerated storage. When installing ThermoCable™ in a rack system with or without a sprinkler system, FM guidelines must be followed along with the manufactures recommendations.

Open Rack Storage without Sprinklers

When installing the ThermoCable™ in open rack system without a sprinkler system, the number of detection wire runs is based on the height of the rack. As a general rule, there should be one detection wire run for every 10 feet of rack height. The detection wire should be attached to the load beam and run in the transverse flue space.

- For example, an 18 foot rack should be given two wire runs while a 40 foot system should have four wire runs.

For more details, please refer to NFPA 72 regarding these, and similar types of installations.

Open Rack Storage with Sprinkler Protection

In the case of signal or double row racks, one line of ThermoCable™ is needed for each sprinkler level as shown in figure 2. The detection wire should be attached to the load beam at the sprinkler level and run in the transverse flue space. For multiple row racks, each sprinkler line would require a corresponding run of detection wire.

Installation:

The leader wire is run from the fire alarm control/releasing panel to a J-Box mounted to the rack for a particular zone. The ThermoCable™ is then run from the J-Box through the racks as indicated in Figures 1 and 2, which may then cross the aisle to a second rack system. When mounting the detection wire on the horizontal load beam, utilize the angle iron or open channels of the rack structure to help protect the detection wire from accidental breakage from forklifts and product. The wire may be fastened to these structures by using TC1012 cable clips made from nylon 6.6 to withstand the continuous cold or subzero temperatures. When crossing aisles, be sure to elevate the ThermoCable™ enough to stay clear of any possible damage that may be caused by forklifts, cranes or product. Detection wire may be run one section above the sprinkler level to prevent damage to both the sprinkler pipe and detection cable simultaneously which may alarm and begin to flow water.

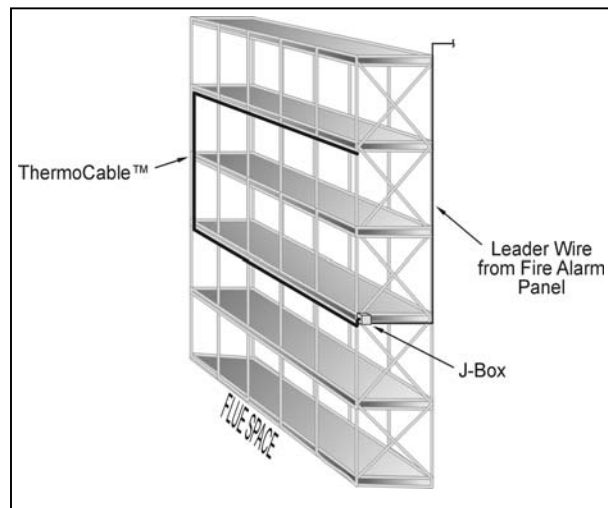


Figure 1

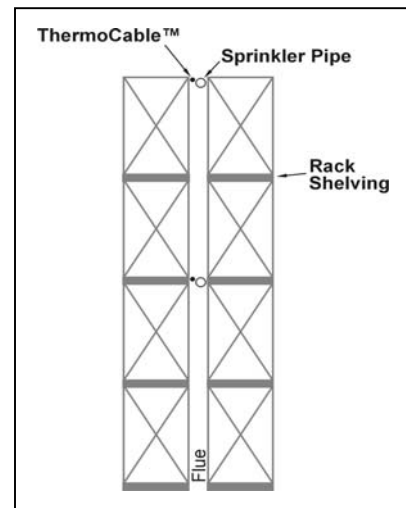


Figure 2

A refrigerated storage warehouse may require a Class A detection circuit rather than Class B. For this type of installation, a copper wire is run from a J-Box at the end of the detection wire zone back to the panel to complete the circuit. Please see Section 7.2 for wiring diagrams.

ThermoCable™ will contract as temperature drops when a refrigerated storage warehouse is brought down to operating temperature. Installations in refrigerated storage areas, prior to cool down, require a certain amount of sag to be maintained during installation to accommodate for contraction. Figure 3 is a chart to assist in determining the amount of sag, which should be maintained between mounting fasteners.

Sag Chart		
Temperature	Sag	Wire Mount Spacing
20°	3/4"	5'
0°	7/8"	5'
-20°	1"	5'
-40°	1 1/8"	5'

Figure 3

Pre-Action and Deluge Sprinkler Systems

When using ThermoCable™ as an initiating device for pre-action sprinkler systems, attention should be paid to the spacing and location guidelines provided by Factory Mutual (FM).

Generally, FM acceptance requires that linear heat detection wire be installed at spacing not greater than that allowable for a ceiling sprinkler system. The detection wire should be run parallel to each sprinkler branch line to the end of the line then run at a right angle to the next sprinkler line coming back in the opposite direction and continued until the end of the detection zone. Insure that any right angle bend in the detector wire maintains at least a 3" radius. A ThermoCable™ wire run (zone) can utilize up to 10,000 feet (3,048 meters) of detection cable. If the sprinkler zone requires more than 10,000 feet of detection wire, an additional detection zone will be required.

Zone Definitions

It is important to note that a detection zone allocation for ThermoCable™ should not be confused with a zone allocation for a sprinkler system. If a sprinkler zone extends beyond the capabilities of a signal detection zone then an additional detection zone must be added. In this case, either detection zone will operate the same solenoid valve for the sprinkler zone. Detection zone coverage should not extend beyond the coverage of the sprinkler zone.

These notes are to be used as general guidelines for installing ThermoCable™ linear heat detection (LHD) wire. Please be sure to check all local and state codes prior to designing and installing a system. It is advisable to contact the local AHJ in the planning stages of a project.

SAFE Fire Detection Inc.
5915 Stockbridge Dr.
Monroe, NC 28110
Phone: (704) 821-7920
Fax: (704) 821-4327
Website: www.safefiredetection.com
E-mail: staff@safefiredetection.com

