

## Linear Heat Detection in Open-Air Parking Structures

### How CTI can detect overheats caused by modern vehicles.

NFPA 88A, the National Fire Protection Association's "Standard for Parking Structures", defines an open parking structure as one with "uniformly distributed openings on two or more sides", with at least 20% of the total area of the outside perimeter and interior walls being open. The openings also must be distributed over at least 40% of the length of the building perimeter, or on two opposing sides. Though in most jurisdictions, open-air parking structures have not been required to have automatic fire detection nor suppression, codes are currently being updated to add detection and suppression due to several factors:

Plug-in hybrid electric vehicles, fully electric vehicles, and hydrogen fuel cell vehicles all utilize polymers and other combustibles that ignite easily, contain a lot of chemical energy, and burn intensely. There is an increasing amount of modern electric cars that contain lithium-ion batteries which are more difficult to extinguish than gasoline or diesel fires and require large amounts of water to fully contain and mitigate the hazard. Fires in cars with hydrogen fuel cells provide a different challenge, as hydrogen is much lighter than air. Leaking or burning hydrogen can quickly send flames upwards in a column, as opposed to a gasoline-fueled car, where spilled fuel leaks underneath the vehicle. Another factor contributing to the need for fire detection in these facilities is that parking structures often attempt to maximize the use of space in order to fit as many cars as possible – making fires easier to spread from car to car and increasing fire size.

To combat the threat of fire that modern vehicles pose, linear heat detection can be installed in open-air parking structures as part of a single or double interlocked pre-action sprinkler system. Protectowire's Confirmed Temperature Initiation (CTI) used in conjunction with the CTM Interface Module is recommended for this application given the potential for mechanical damage, such as overloaded or construction vehicles and maintenance crews with ladders. In the event of a short fault caused by mechanical damage, no pre-action system will be initiated, protecting open-air parking structures from the costly damage of having water in the pipes without a fire condition. CTI Linear Heat Detectors are unique, patented detectors that are designed to prevent false alarms by confirming an actual heat event prior to an alarm being initiated and should be installed per the NFPA 72 Fire Alarm & Signaling Code.

Protectowire's CTI Linear Heat Detectors range in alarm temperature from 155°F (68°C) to 356°F (180°C) and are a simple and cost-effective method of detecting fires in open-air parking structures.

### Questions?

If you have further questions please visit [protectowire.com](https://protectowire.com) or call **781-826-3878**.

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