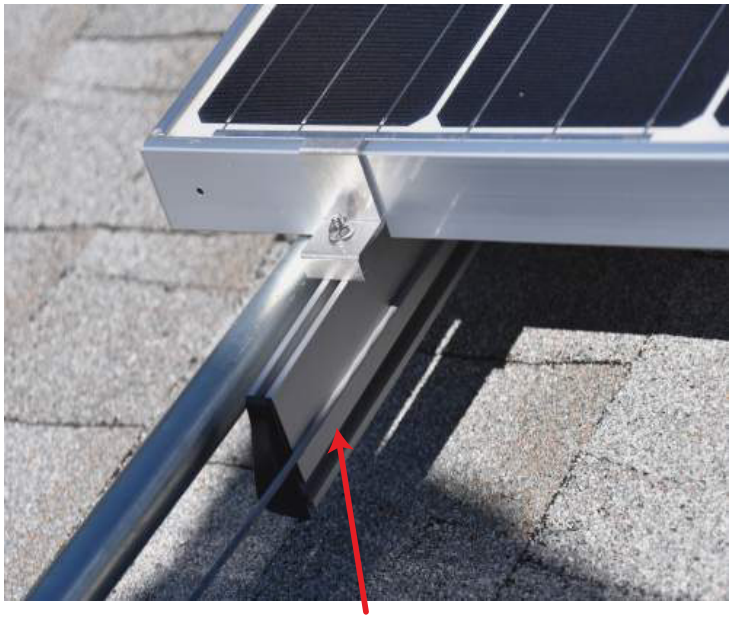
Overheat and Fire Detection For Solar Panels

SPECIAL HAZARD APPLICATION

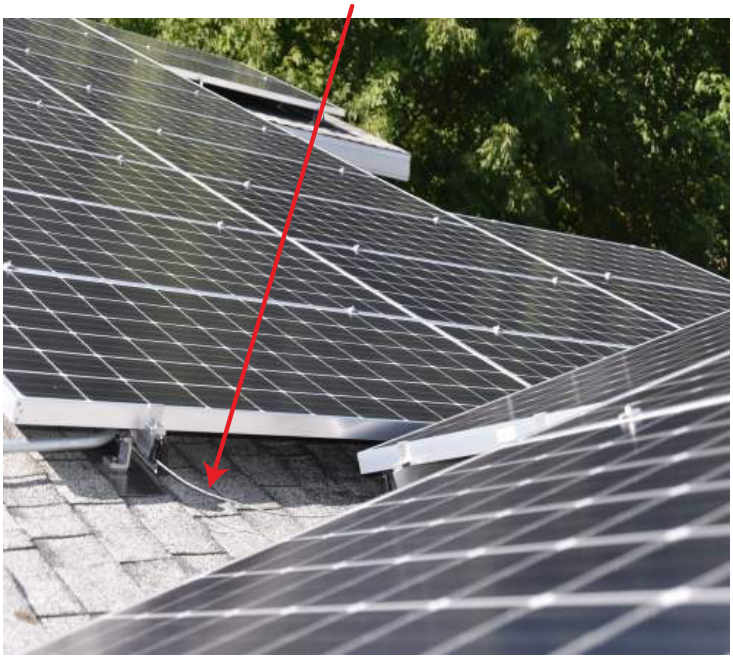
A solar panel works by allowing photons, or particles of light, to knock electrons free from atoms, generating a flow of electricity. The use of solar power for both residential and industrial commercial use is continuously gaining momentum. As this technology grows in popularity, so has the challenge of properly protecting these panel installations. Up until now the most common way to spot a fire on a solar panel is from a report from a person passing the array. With limited federal or local regulations for fire detection, solar panels are often left vulnerable to triggering catastrophic damage.

Solar panel fires are typically caused by short circuits, maintenance operations, roof debris, animal nests, physical damage or the panel overheating. Protectowire's Confirmed Temperature Initiation (CTI) Series Linear Heat Detector (LHD) is a fixed temperature detector designed to meet the detection challenges presented in solar panel installations. The CTI-220-XCR requires heat to generate an alarm condition, physical damage to the detector will not produce an alarm. All CTI-XCR Linear Heat Detectors have a minimum operating temperature of -40F (-40C) and are available in a fluoropolymer jacket that offers superior ultra-violet and abrasion resistance.The CTI Series Linear Heat Detector is monitored by a CTM-530 module, this interface module is compatible with virtually all fire alarm control panels. The CTM-530 module offers multiple interface options that include form C relay contacts and two 4-20 mA outputs all designed to simplify integration into a control panel or building system.

Solar panels can add significant weight to any roof. Further, given their close proximity to the roof the rapid spread of heat or fire is highly probable. Knowing when the roof is potentially compromised assists occupants and first responders in avoiding hazardous situations. The Protectowire CTM-530 module has integrated alarm point location to assist first responders in determining the hotspot location. Having a fast response time can mean the difference between a controlled fire situation and a major recovery operation



Protectowire LHD CTI Series



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Installation Recommendations

The CTM-530 module can supervise a single 4000 ft. (1220 m.) zone of the CTI-220-XCR Linear Heat Detector in either a Class A or Class B configuration. (Please see the Protectowire Installation Manual for more details on the difference between the two configurations.) Typically, in solar panel applications the CTI-220-XCR Detector is installed along the highest longitudinal support bar of the metal framework designed to elevate/angle the solar panel from the roof. Factory recommended stainless steel mounting clips (OHS-SS) should be used to mount the detector to the support bars and framework system. It is important to also provide adequate slack or "sag" in the wire during the installation process in order to compensate for contraction of the detector, which occurs during normal temperature fluctuations.

Zone mapping or recording the linear layout of the CTI-220-XCR Detector is essential for identifying a fire location. When an off normal condition exists, the CTM-530 module will display the location of the fault or fire. A properly recorded zone map (see example layout) allows operators or first responders to immediately correlate the linear footage displayed on the CTM-530 module to the physical location of the CTI-220-XCR Detector on the solar array.

*CTI-220-XCR reccomended for most solar roof applications. Actual required detector type may vary.

Zone Map Example Layout - Roof Top Solar Array