



# Protectowire CTI™ Confirmed Temperature Initiation Linear Heat Detectors



## Features

- Digital operation with short circuit discrimination capable of distinguishing between short circuit and alarm conditions.
- Two distinct heat sensing technologies.
- Confirmed temperature initiation for highest immunity to nuisance alarms.
- Compatible with Protectowire Alarm Point Location Meter.
- Withstands a wide range of environmental conditions.
- Available in five alarm temperatures to accommodate the widest range of applications.

## Description

The Protectowire family of Confirmed Temperature Initiation Linear Heat Detectors, are advanced multi-criteria detectors consisting of models with alarm temperatures ranging from 155°F (68°C) to 356°F (180°C). Each Detector is comprised of two special metallic alloy conductors individually insulated with a heat sensitive polymer. The insulated conductors are twisted together to impose a spring pressure between them, then wrapped with a protective tape and finished with a durable flame retardant outer jacket.

The Detectors are fixed temperature digital sensors that are capable of initiating an alarm signal once their rated activation temperature is reached. At the rated temperature, the heat sensitive polymer insulation yields to the pressure upon it allowing the conductors to move into contact with each other thereby creating a short circuit temperature measuring junction point. The associated zone control module is designed to detect a short circuit and enter a heat measuring thermocouple mode. By entering the thermocouple mode, the

control module is able to identify the temperature at the short and determine the type of off-normal condition being created based upon the alarm temperature threshold of the Detector.

If the interface control module determines that the temperature at the short is above the predetermined alarm threshold temperature, the module initiates an ALARM condition and displays the location of the alarm if equipped with the Protectowire Alarm Point Location Meter. If, however, the control module determines the temperature is below the alarm temperature threshold, it initiates a short circuit fault or TROUBLE condition and displays its location on the Protectowire Alarm Point Location Meter (if provided) so it can be corrected. The Protectowire advanced multi-criteria detectors are the first digital type linear heat detectors to provide true confirmed temperature initiation and mechanical short circuit discrimination. They provide stable linear temperature response with verified alarm temperature confirmation for exceptional false alarm immunity.



An ISO 9001:2008 Registered Company



## Protectowire CTI™ Features & Benefits

- Uses advanced multi-criteria detection for highest immunity to false alarms.
- Measures and confirms the temperature at the alarm point to provide true Confirmed Temperature Initiation (CTI).
- Reliable digital operation with separate short circuit fault identification. Protectowire's advanced multi-criteria detectors are the only digital type linear heat detectors capable of distinguishing between short circuits and true alarm conditions.
- Identifies and displays the location of an overheat or fire condition anywhere along its length when used with a Protectowire Alarm Point Location Meter.
- Protectowire's advanced CTI Linear Heat Detector is manufactured under U.S. Patent 8,096,708 and has patents pending in many countries around the world.

## Installation

Protectowire CTI Linear Heat Detectors are approved as heat actuated automatic fire detectors and are intended to be used on a supervised initiating circuit with an approved fire protective signaling control unit. The Detectors must be installed in continuous runs without taps or branches in accordance with applicable sections of NFPA 70 National Electrical Code, NFPA 72 National Fire Alarm Code, or as determined by the local authority having jurisdiction.

Protectowire may be installed at the ceiling level or on the side walls within 20 inches (50cm) of the ceiling, to protect areas within buildings. The Detector has the additional benefit of being suitable for installation close to the hazard ( i.e. cable trays) in order to provide a rapid response. This is known as proximity or special application protection.

Recommended practice is to locate the associated Interface Module near the hazard area and connect the CTI Linear Heat Detector directly to the module. The Interface Module provides Form C

(SPDT) contacts for Alarm, Trouble, and Short Circuit Fault connection to the host fire alarm control panel. When necessary, "T" type thermocouple extension grade wire, of an approved type, with a minimum conductor size of 20 AWG, may be installed as interposing cable from the Interface Module out to the beginning of the CTI Detector portion of the initiating circuit.

The CTI Detector portion of each initiating circuit shall begin and terminate at each end in an approved zone box or end-of-line zone box. In order to hold the cable securely, SR-502 Series Strain Relief Connectors shall be installed in all zone boxes where the CTI Linear Heat Detector enters or exits the enclosure.

## Installation Accessories

A comprehensive range of mounting and installation accessories are available for the installation of Protectowire CTI Linear Heat Detectors. Only installation hardware supplied or approved by the Protectowire Company should be used.

Messenger wire is also available for the Detector on special order. It consists of high tensile strength stainless steel wire, which is wound around the Detector at the rate of approximately one turn per foot. It is a carrier or support wire that is designed to simplify the installation of the Detector in areas where mounting is difficult. Consult the Protectowire Company for details regarding your specific application.

## Specifications

Maximum Voltage Rating: 30 VAC, 42 VDC

Resistance: .282 ohms/ft. (.925 ohms/m)

Conductor Polarity: Un-insulated Copper Colored Conductor – Positive (+)  
Un-insulated Silver Colored Conductor – Negative (-)

Min. Bend Radius: 2.5 inches (6.4 cm)

Weight: Nominal 7.5 lbs. / 500 ft.  
(3.4 kg / 152 m)

## Temperature Ratings & Model Numbers

| Product/Jacket Type                                                                                        | Model Number | Alarm Temperature | Max. Recommended Ambient Temperature | Max. Listed Spacing FM | Max. Listed Spacing UL/cUL |
|------------------------------------------------------------------------------------------------------------|--------------|-------------------|--------------------------------------|------------------------|----------------------------|
| <b>CTI</b><br>Multi-Purpose/<br>Commercial &<br>Industrial Applications                                    | CTI-155      | 155°F (68°C)      | 115°F (46°C)*                        | 30ft (9.1m)            | 50ft (15.2m)               |
|                                                                                                            | CTI-190      | 190°F (88°C)      | 150°F (66°C)                         | 30ft (9.1m)            | 50ft (15.2m)               |
|                                                                                                            | CTI-220      | 220°F (105°C)     | 175°F (79°C)*                        | 25ft (7.6m)            | 50ft (15.2m)               |
|                                                                                                            | CTI-280      | 280°F (138°C)     | 200°F (93°C)                         | 25ft (7.6m)            | 50ft (15.2m)               |
|                                                                                                            | CTI-356      | 356°F (180°C)     | 221°F (105°C)                        | See Note 1             | 50ft (15.2m)               |
| <b>CTI-X</b><br>High Performance/<br>Excellent Abrasion,<br>Weathering & Chemical<br>Resistance Properties | CTI-155X     | 155°F (68°C)      | 115°F (46°C)*                        | 30ft (9.1m)            | 50ft (15.2m)               |
|                                                                                                            | CTI-190X     | 190°F (88°C)      | 150°F (66°C)                         | 30ft (9.1m)            | 50ft (15.2m)               |
|                                                                                                            | CTI-220X     | 220°F (105°C)     | 175°F (79°C)*                        | 25ft (7.6m)            | 50ft (15.2m)               |
|                                                                                                            | CTI-280X     | 280°F (138°C)     | 200°F (93°C)                         | 25ft (7.6m)            | 50ft (15.2m)               |
|                                                                                                            | CTI-356X     | 356°F (180°C)     | 250°F (121°C)                        | See Note 1             | 50ft (15.2m)               |

\*For open area applications the recommended UL 521 maximum ambient temperature for CTI-155 models is 100°F (38°C), and CTI-220 models is 150°F (66°C). Temperatures shown in table are acceptable for UL Special Application use.

Note 1: FM Approved for special application use only. All models can be supplied on Messenger Wire. Add Suffix "-M" to the above model numbers.