

PART 1 – HEAT DETECTION

A. SUMMARY

1. Section includes Linear Heat Detection Systems.

B. REFERENCES

1. National Fire Protection Association (NFPA):
 - a. NFPA 72 National Fire Alarm and Signaling Code (current edition)
 - b. Factory Mutual Insurance (FM) Approval Guide and/or Underwriters Laboratories Inc. (UL) Fire Protection Equipment Directory and/or Underwriters Laboratories Canada (c-UL-us) Fire Protection Equipment Directory
2. State and Local Codes.

C. SYSTEM DESCRIPTION

1. Design Requirements:
 - a. Shall consist of an approved Digital Linear Heat Detector that is designed to reduce false alarming due to physical damage. The detector shall employ Confirmed Temperature Initiation Technology (CTI). Through an interface module the detector shall have the ability to determine the distance to an alarm or short fault location, have an event history buffer, and lights indicating system status.
 - b. The Linear Heat Detection System's spacing shall and/or proximity locations be determined by applicable NFPA, State Codes, Local Codes, International Codes and/or the manufacturer's recommendations.
2. Performance Requirements:
 - a. Shall be rated for up to 30-foot spacing and/or proximity detection.
 - b. Shall be compatible with any listed or approved fire alarm panel.
 - c. Shall detect an overheat or fire at its rated temperature.
 - d. Shall report any equipment related fault through a fault output relay.
 - e. Shall be installed to comply with NFPA standards (and the authority having jurisdiction and/or the manufacturer's recommendations).

D. SUBMITTALS

1. Submit product data and shop drawings including isometric and plan view layouts of the system to respective authority.
2. Supply one copy of the manufacturer's Installation & Operation Manual after completion of installation.

E. QUALITY ASSURANCE

1. Qualifications:
 - a. Contractor: The contractor shall have a minimum of 5 years' experience in the design and installation of fire detection systems.
 - b. Equipment suppliers: The equipment suppliers shall be factory authorized and trained by the manufacturer to design, install and maintain all aspects of the system.

2. Regulatory Requirements:

- a. Codes and approvals: Equipment supplier shall conform to the local code requirements and approvals applicable to this section. Supplier must obtain and pay all necessary permits prior to beginning work in this section.
- b. The system shall be Factory Mutual approved and/or Underwriters Laboratories and/or Underwriter Laboratories certified for Canada.

F. PROJECT CONDITIONS

1. Physical/Environmental Requirements:

- a. The interface module shall be permanently mounted where specified on the shop drawings or in a location to facilitate access and ease of service.
- b. The module with an LCD must be mounted in an ambient temperature range* of -40° to 140° Fahrenheit. *Modules with a LCD display are suitable for an ambient temperature range of -20° to 140° Fahrenheit.
- c. Where the environment is harsh, the interface module shall be fitted with a NEMA 4X enclosure.

G SEQUENCING and SCHEDULING

1. Coordinate work performed under this section with work specified in other sections.

H. MAINTENANCE

1. Maintenance Service: Shall be provided by a factory authorized and factory trained representative in accordance with the manufacturer's recommendations, NFPA 72 and local requirements of the authority having jurisdiction.

PART 2 – PRODUCTS

A MANUFACTURER

1. Linear Heat Detection System:

Acceptable Manufacturer:

The Protectowire Co., Inc.
60 Washington Street.
Pembroke MA, 02359
Ph.: 781-826-3878

2. Detection Method: Linear Heat Detection – Confirmed Temperature Initiation (CTI)

B. Linear Heat Detection outer jackets and options:

(Choose one):

TYPE CTI (PVC JACKET)

CTI-155 Protectowire, Type CTI (155°F / 68°C)

CTI-155-M Protectowire, Type CTI on Msg. Wire

CTI-190 Protectowire, Type CTI (190°F / 88°C)

CTI-190-M Protectowire, Type CTI on Msg. Wire

CTI-220 Protectowire, Type CTI (220°F / 105°C)
CTI-220-M Protectowire, Type CTI on Msg. Wire

CTI-280 Protectowire, Type CTI (280°F / 138°C)
CTI-280-M Protectowire, Type CTI on Msg. Wire

CTI-356 Protectowire, Type CTI (356°F / 180°C)
CTI-356-M Protectowire, Type CTI on Msg. Wire

TYPE CTI-X (FLUOROPOLYMER JACKET)

CTI-155X Protectowire, Type CTI-X (155°F / 68°C)
CTI-155X-M Protectowire, Type CTI-X on Msg. Wire

CTI-190X Protectowire, Type CTI-X (190°F / 88°C)
CTI-190X-M Protectowire, Type CTI-X on Msg. Wire

CTI-220X Protectowire, Type CTI-X (220°F / 105°C)
CTI-220X-M Protectowire, Type CTI-X on Msg. Wire

CTI-280X Protectowire, Type CTI-X (280°F / 138°C)
CTI-280X-M Protectowire, Type CTI-X on Msg. Wire

CTI-356X Protectowire, Type CTI-X (356°F / 180°C)
CTI-356X-M Protectowire, Type CTI-X on Msg. Wire

INTERFACE MODULE

CTM-530 CTI Interface Module w/Display and Nav. Buttons less Enclosure
CTM-530E CTI Interface Module w/Display and Nav. Buttons in NEMA-4X (IP66) Enclosure
CTM-530E-I CTI Interface Module w/Display, Nav. Buttons and ISB in NEMA-4X (IP66) Enclosure

CTM-530LT CTI Interface Module w/o Display and Nav. Buttons less Enclosure
CTM-530LTE CTI Interface Module w/o Display and Nav. Buttons in NEMA-4X (IP66) Enclosure
CTM-530LTE-I CTI Interface Module w/ISB w/o Display and Nav. Buttons in NEMA-4X (IP66) Enclosure

C. COMPONENTS

1. The Linear Heat Detection System:

- a. Listed and approved Addressable Panel or Conventional panel.
- b. The detection principle shall be CTI Digital Linear Heat Type, and be capable of detecting over heat conditions at a fixed temperature and offer short circuit discrimination.

D. EQUIPMENT

- a. The Linear Heat Detection Cable shall be a fixed temperature sensing element comprised of two dissimilar metal electrical current carrying wires separated by a heat sensitive insulation material.
- b. The detection cable shall detect the specified temperature anywhere along the detector length, regardless of the source of the heat. Averaging, analog-integrating, or thermistor-type detection cables, and rate compensated, or rate-of-rise detection devices, are not acceptable.

- c. Detectors that depend on open flame, density of smoke, or rate of temperature increase are not acceptable.
- d. The detection cable shall be constructed by twisting the two heat sensitive coated dissimilar metal conductors together then wrapping the pair with protective polyester tape and then jacketing them in a protective outer covering of either PVC or Fluoropolymer. The detection cable shall be capable of withstanding severe seasonal temperature variations and structural vibrations.
- e. The temperature rating of the detection cable shall be clearly printed on the cable jacket.
- f. When the detection cable will be required to span distances in excess of the manufacturer's standard mounting guidelines, it shall be constructed with an integral messenger wire. The messenger wire shall consist of a high tensile strength corrosion-resistant stainless steel wire which shall be wrapped around the detector to provide mounting support.
- g. The detection cable temperature ranges shall be selected for the expected maximum ambient temperature and the alarm activation temperature suitable for the application in accordance with the manufacturer's guidelines.
- h. The detection cable jacket shall be determined by the application environment and in accordance with the manufacturer's guidelines.
- i. The initiating circuit shall be capable of intrinsically safe service and approved for Class I, II and III, Division 1, Groups A, B,C, D, E, F and G; Class I, Zone 0, AEx ia IIC T6 Ga $-29^{\circ}\text{C} \leq T_a \leq +60^{\circ}\text{C}$

PART 3 - EXECUTION

A. INSTALLATION

1. The Linear Heat Detection System: The contractor shall install the system in accordance with the manufacturer's installation recommendations and Operational Manual.

B. FIELD QUALITY CONTROL

1. Testing and Commissioning:

- a. The contractor shall commission the complete installation in the presence of the end user or their appointed representative.
- b. The contractor shall provide materials all necessary instrumentation, test equipment and labor.
- c. The contractor shall record all test and commissioning requirements and a copy shall be provided to the end user or an authorized representative.
- d. Checks must be made to ensure that all ancillary equipment and warning devices are operational as designed and specified with care taken not to discharge a suppression system.
- e. The contractor shall upon completion of commissioning and testing provide the end user or authorized representative with the as-built drawings. Installation and Operation Manuals for the system shall be provided.