



# Protectowire Linear Heat Detector



## Features

- Line coverage...continuous sensitivity.
- Seven alarm temperature ratings.
- Withstands severe environmental conditions.
- Approved for hazardous locations.
- Easy to install, test, and splice.
- Compatible with other initiation devices on same circuit.
- Separate pre-alarm and alarm actuations (Type TRI).

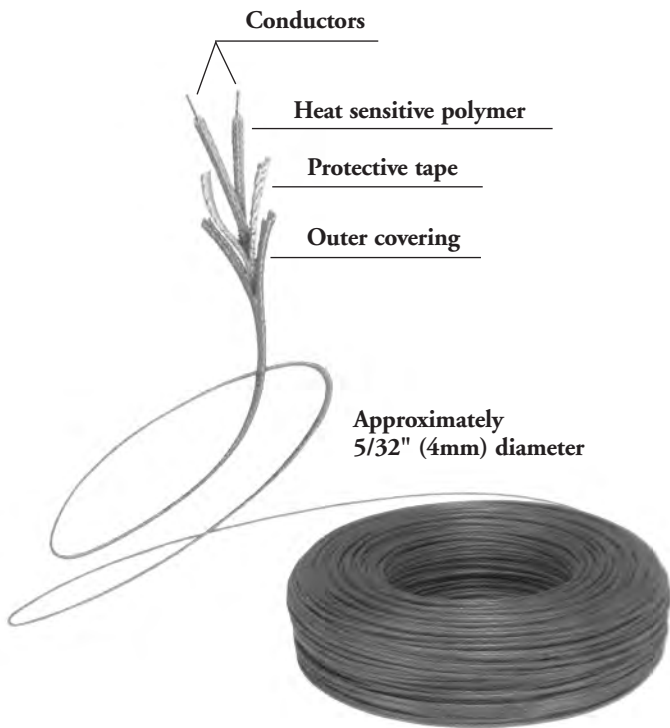
## Introduction

Protectowire Linear Heat Detector is a proprietary cable that detects heat anywhere along its length. The sensor cable is comprised of two steel 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 an outer jacket suitable for the environment in which the Detector will be installed.

Protectowire is a fixed temperature digital sensor and is therefore capable of initiating an alarm once its rated activation temperature is reached. At the rated temperature, the heat sensitive polymer insulation yields to the pressure upon it, permitting the inner conductors to move into contact with each other thereby initiating an alarm signal. This action takes place at the first heated point anywhere along the Detector's length. It does not require that a specific length be heated in order to initiate an alarm nor is system calibration necessary to compensate for changes in the installed ambient temperature. Protectowire Linear Heat Detector provides the advantages of line coverage with point sensitivity.

# Protectowire...

*the first name in linear heat detection.*



## Applications

- Cable trays
- Conveyors
- Power distribution apparatus: switchgear, transformers, motor control centers
- Dust collectors/baghouses
- Cooling towers
- Warehouses/rack storage
- Mines
- Pipelines
- Bridges, piers, marine vessels
- Refrigerated storage
- Tank farms
- Aircraft hangars

Ideally suited to industrial high risk hazards as well as many types of commercial applications, Protectowire Linear Heat Detector has unique advantages over other types of detectors, especially when difficult installation factors or severe environmental conditions are present.

When used with a Protectowire FireSystem Control Panel, the Detector will activate a display, showing the location of an over heat or fire condition anywhere along its length. The Detector also meets intrinsically safe standards and is FM Approved for Class I, II, or III, Div. 1, Applicable Groups A, B, C, D, E, F & G hazardous areas, when the appropriate control panel option is ordered.

## Protectowire Features & Benefits

- Identifies and displays, at the control panel, the alarm location anywhere along its length when used with the exclusive Protectowire Alarm Point Location Meter.
- Sensitivity not effected by changes in ambient temperature or length of cable used on the detection circuit. Compensating adjustments are not required.
- Steel inner conductors and select outer jackets, provide resistance to mechanical damage.
- Simple to install and splice with common tools. Junctions can be made without effecting the integrity of the system.
- Compatible with other types of alarm initiating devices on the same circuit such as manual pull stations, thermal heat detectors and smoke detectors.
- Can be installed in hazardous areas when used with suitably approved Protectowire FireSystem Control Panels.
- Full range of temperatures and models available to accommodate the most demanding applications.
- Different temperature detectors may be utilized in the same initiating circuit.
- Available on stainless steel messenger wire for installations where mounting is difficult such as large open areas.
- Portable test equipment available for easy field service.
- Ideally suited for activation of extinguishment equipment, such as deluge or pre-action sprinkler systems.

## Description

The Detector is made in multiple temperature ratings to allow for differences in normal ambient temperature. Guidelines for selecting the proper detector temperature rating are the same as for automatic sprinklers and other heat actuated devices. Refer to the Temperature Rating Chart for proper model selection based upon installation temperature limits.

The Detector's product range consists of five distinct types of cable. Each designation identifies a specific outer jacket material which has unique characteristics that have been selected to accommodate the widest range of installation environments. All specifications are subject to change without notice.

**EPC** – Type EPC Protectowire consists of a durable flame retardant vinyl outer jacket. This series is best described as multi-purpose and is well suited to a wide range of both commercial and industrial applications. The outer jacket provides good all-around performance for most installations. It features low moisture absorption, resistance to many common chemicals, and excellent flexibility at low temperatures.

**EPR** – The EPR series contains an extruded flame retardant jacket of polypropylene elastomer with a special UV stabilizer added to enhance weathering performance. It is intended for a wide range of industrial applications and is characterized by high resiliency, good abrasion resistance, excellent weathering properties, and flexibility over a wide temperature range.

**TRI** – Type TRI Protectowire is a unique dual temperature detector which is capable of initiating separate pre-alarm and alarm signals once each of its rated activation temperatures is reached. The Detector consists of a durable vinyl outer jacket which features low moisture absorption, resistance to many common chemicals, excellent flexibility and flame retardant. For complete information on this product, please refer to Data Sheet 9114.

**XCR** – Type XCR utilizes a high performance fluoropolymer jacket. This detector is specifically designed for use in applications where extreme environmental and product performance criteria must be met.

In general, the flame retardant, low smoke XCR jacket provides excellent abrasion resistance and mechanical properties over a broad range of temperatures. It provides excellent chemical and permeation resistance to a wide variety of acids, bases, and organic solvents as well as simple gases. In addition, the jacket exhibits very little change in tensile properties upon outdoor exposure to sunlight and weather.

**XLT** – Protectowire Type XLT is a unique detector that has been designed for use in cold storage facilities and other applications that require a low alarm activation temperature. The outer jacket consists of a proprietary flame retardant polymer that is specifically formulated to provide low moisture absorption, good chemical resistance, and excellent low temperature environmental performance. This detector has been UL and FM tested to -60°F (-51°C).

## Installation

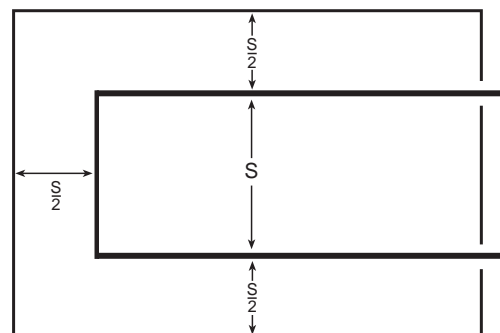
Protectowire Linear Heat Detector is approved as a heat actuated automatic fire detector and is intended to be used on a supervised initiating circuit of an approved fire protective signaling control unit. The Detector must be installed in continuous runs without taps or branches in accordance with applicable 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 of the ceiling, to protect areas within buildings (area protection). The Detector has the additional benefit of being suitable for installation close to the hazard in order to provide a rapid response (proximity or special application protection).

On smooth ceilings, the distance between detector runs shall not exceed the listed spacing. There shall be a detector run within a distance of one-half the listed spacing, measured at a right angle, from all walls, or partitions extending to within the top 15% of the ceiling height as shown in the illustration.

The listed spacing shall be used as a guide or starting point in detector installation layout. Reduced spacing is required based upon factors such as ceiling height and construction, physical obstructions, air movement, or the authority having jurisdiction.

When Protectowire is used to activate sprinkler systems, special Factory Mutual (FM) spacing guidelines may also be applicable to the specific hazard being protected. It is mandatory that engineering judgment be applied in determining final detector location and spacing.



Ceiling of protected area  
S=Listed spacing. See chart below.

In general, the use of Protectowire in any initiating device circuit, is limited to coverage of a specific hazard or area. Copper wire, of an approved type, with a minimum conductor size of 18 AWG, shall be installed from the control panel out to the hazard area where it is then connected to the beginning of the Protectowire portion of the circuit. The Protectowire portion of each initiating circuit shall begin and terminate at each end in an approved zone box or end-of-line zone box. SR-502 Series, Strain Relief Connectors, shall be installed in all zone boxes where Protectowire enters or exits the enclosure, in order to hold the cable securely.

## Temperature Ratings and Model Numbers *(Use Linear Detector of Proper Temperature Rating)*

Product Type	Model Number	Alarm Temperature	Max. Recommended Ambient Temperature	Approvals/Max. Listed Spacing	
				UL/cUL	FM
<b>EPC</b> Multi-Purpose/ Commercial & Industrial Applications	PHSC-155-EPC PHSC-190-EPC PHSC-220-EPC PHSC-280-EPC PHSC-356-EPC	155° F (68° C) 190° F (88° C) 220° F (105° C) 280° F (138° C) 356° F (180° C)	115°F (46°C) 150°F (66°C) 175°F (79°C) 200°F (93°C) 221°F (105°C)	50 ft. (15.2m) 50 ft. (15.2m) N/A 50 ft. (15.2m) 50 ft. (15.2m)	30 ft. (9.1m) 30 ft. (9.1m) 25 ft. (7.6m) 25 ft. (7.6m) See Note 1
<b>EPR</b> Good Weathering Properties & High Temperature Jacket Performance	PHSC-155-EPR PHSC-190-EPR PHSC-280-EPR PHSC-356-EPR	155° F (68° C) 190° F (88° C) 280° F (138° C) 356° F (180° C)	115°F (46°C) 150°F (66°C) 200°F (93°C) 250°F (121°C)	50 ft. (15.2m) 50 ft. (15.2m) 50 ft. (15.2m) 50 ft. (15.2m)	30 ft. (9.1m) 30 ft. (9.1m) 25 ft. (7.6m) See Note 1
<b>TRI</b> Applications Requiring Pre-alarm	PHSC-6893-TRI	Pre-alarm: 155° F (68° C) Alarm: 200° F (93° C)	115°F (46°C)	N/A	15 ft. (4.6m)
<b>XCR</b> High Performance/ Industrial Applications Excellent Abrasion & Chemical Resistance	PHSC-155-XCR PHSC-190-XCR PHSC-220-XCR PHSC-280-XCR PHSC-356-XCR	155° F (68° C) 190° F (88° C) 220° F (105° C) 280° F (138° C) 356° F (180° C)	115°F (46°C) 150°F (66°C) 175°F (79°C) 200°F (93°C) 250°F (121°C)	50 ft. (15.2m) 50 ft. (15.2m) N/A 50 ft. (15.2m) 50 ft. (15.2m)	30 ft. (9.1m) 30 ft. (9.1m) 25 ft. (7.6m) 25 ft. (7.6m) See Note 1
<b>XLT</b> Multi-Purpose/ Excellent Low Temp. Properties	PHSC-135-XLT	135° F (57° C)	100°F (38°C)	50 ft. (15.2m)	30 ft. (9.1m)

Note 1: FM Approved for special application use only.

All Protectowire models can be supplied on Messenger Wire. Add suffix “-M” to above model numbers.



## Specifications

<b>Maximum Voltage Rating:</b>	30 VAC, 42 VDC
<b>Resistance 2W Models:</b>	.2 ohms/ft. (.656 ohms/m)
<b>Resistance TRI-Wire:</b>	.3 ohms/ft. (.984 ohms/m)
<b>TRI-Wire Conductor Color Code:</b>	Pink = 155° F; Clear = 200° F; Black = Common
<b>Min. Bend Radius:</b>	2.5 inches (6.4cm)
<b>Diameter:</b>	Nominal 5/32 inch (4mm)
<b>Weight:</b>	Nominal 8lbs./500 ft. (3.6 kg/152m)

## Installation Accessories

A comprehensive range of mounting and installation accessories are available for the installation of Protectowire Linear Heat Detector. These include several types of clips, straps, drive rings, beam clamps, cable standoffs, connectors and zone boxes. Their proper use assures a neat and reliable installation. Only installation hardware supplied or approved by The Protectowire Company should be used.

Messenger wire is also available for any model 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 which is designed to simplify the installation of the Detector in areas where mounting is difficult due to the lack of appropriate support structures or mounting surfaces. When using messenger wire to support the Detector, turnbuckles and eyebolts must be employed at each end of a run to place tension on the support wire. The maximum Detector run length between turnbuckles

should not exceed 250 feet (76m) and the wire must also be supported with approved intermediate fasteners at intervals ranging from 15 feet (4.5m) to 50 feet (15m) depending upon the application. Outdoor messenger wire installations present additional challenges due to environmental factors such as snow loads, ice build-up or wind. Increased detector support must be provided by using additional intermediate fasteners with closer spacing in all outdoor installations. When ordering messenger wire configurations, add suffix “-M” to the Protectowire model number.

All models of Protectowire Linear Heat Detector have the same size conductors and are readily spliced together with common tools, by means of PWS Splicing Sleeves or PWSC Splicing Connectors. These devices are designed for this specific purpose and are the only approved methods of splicing the Detector.

## System Capabilities

Protectowire Linear Heat Detector is a component of a complete family of systems manufactured by The Protectowire Company — a leader in fire detection for over seventy years.

Protectowire fire detection systems provide a complete single source solution for meeting any fire defense need, from hazardous area detection to auxiliary equipment shutdown, and automatic extinguishing release.

## Accessories

The Protectowire Company offers an assortment of fasteners and splicing devices to facilitate installation for both standard and special applications. Full details are available upon request.

