Protectowire Linear Heat Detector

Features

- Line coverage... continuous sensitivity.
- Seven alarm temperature ratings.
- The ability to withstand severe environmental conditions.
- Approval for use hazardous locations when used with required equipment.
- Ease of installation, testing, and splicing.
- Compatibility with other initiation devices on same circuit.
- Listed for spacing up to 50 ft. (15.2m).

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 a specific length to be heated in order to initiate an alarm, nor system calibration to compensate for changes in the installed ambient temperature. Protectowire Linear Heat Detector provides the advantages of line coverage with point sensitivity.

Applications

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 the appropriate Protectowire control equipment, 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 Factory Mutual (FM) Approved for Class I, II, or III, Div. 1, Applicable Groups A, B, C, D, E, F & G hazardous areas, when used with suitably approved Protectowire control equipment.

- 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

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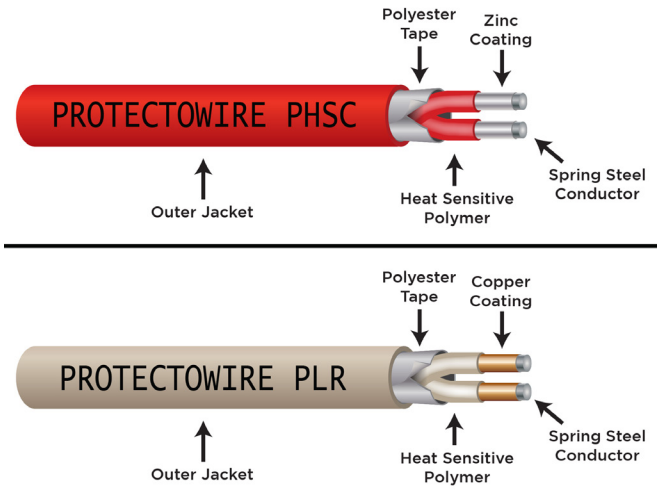


Approximately 5/32" (4mm) diameter

Protectowire Features & Benefits

- Alarm location identified and displayed, at the control panel, anywhere along its length when used with the exclusive Protectowire Alarm Point Location Meter.
- Sensitivity unaffected by changes in ambient temperature or length of cable used on the detection circuit. Compensating adjustments are not required.
- Installation and splicing is simple with common tools. Junctions can be made without effecting the integrity of the system.
- Compatibility with other types of alarm initiating devices on the same circuit such as manual pull stations, thermal heat detectors and smoke detectors.
- Installation possible in hazardous areas when used with suitably approved Protectowire control equipment.
- Full range of temperatures and models available to accommodate the most demanding applications.
- Different temperature detectors may be utilized in the same initiating circuit.
- Detectors available on integrated stainless steel messenger wire for installations where mounting is difficult such as large open areas.
- Test equipment is portable and available for easy field service.
- Detectors are ideal for activation of extinguishing 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 two distinct types of cable. Standard PHSC models and low resistance "Universal" versions designated with the prefix PLR. Each model number designation also identifies a specific outer jacket material carefully selected to accommodate the widest range of installation environments. All specifications are subject to change without notice.

PHSC-EPC – consists of a durable flame retardant vinyl outer jacket and is designed for interior commercial and industrial applications. Features of this jacket include low moisture absorption, resistance to many common chemicals, and excellent flexibility at low temperatures.

PHSC-XCR – consists of a high-performance fluoropolymer jacket and is designed for exterior environments as well as harsh interior applications. Features of this low smoke jacket include excellent chemical resistance, abrasion resistance, weather resistance, and high-temperature performance. XCR is the only detector that is FM-approved for corrosive environments.

PHSC-LSZH – consists of a durable low smoke zero halogen outer jacket and is designed for interior commercial and industrial applications. Features of this jacket include low moisture absorption, resistance to many common chemicals, and excellent flexibility at low temperatures.

PHSC-XLT – consists of a outer jacket that is specifically selected for cold storage and freezers. Features of this jacket include low moisture absorption and excellent performance in extremely low temperatures. This detector has been UL and FM tested to –60°F (–51°C).

PLR-EPR – consists of a polypropylene elastomer jacket and is designed for universal compatibility through the use of special low-resistance inner conductors. Features of this jacket include good abrasion resistance, chemical resistance, and weather resistance.

PLR-XCR – is constructed with low resistance inner conductors, allowing for longer detector zone lengths on most types of fire alarm panels including addressable panels. Utilizing a high performance fluoropolymer outer jacket, this detector is specifically designed for use in applications where extreme environment and product criteria must be met. The flame retardant, low smoke jacket provides excellent abrasion resistance and mechanical properties over a broad range of applications. It provides excellent chemical and permeation resistance to a wide range 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.

Installation

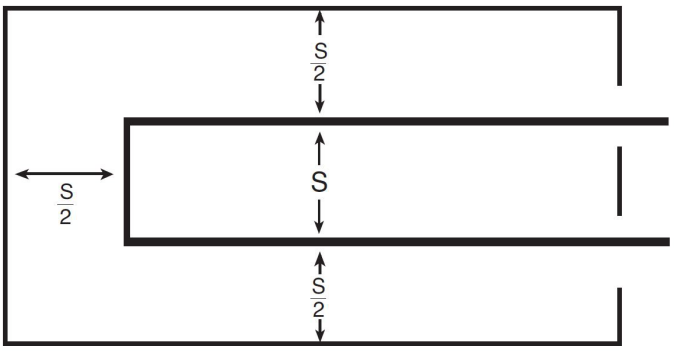
The Protectowire Linear Heat Detector is approved as a heat actuated automatic fire detector and is intended to be used on a supervised initiating circuit of an approved fire protective signaling control unit. The detector must be installed in continuous runs without taps or branches in accordance with 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 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.

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.



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

Specifications

Maximum Voltage Rating:	30 VAC, 42 VDC
Resistance PHSC Models:	.185 ohms/ft. (.607 ohms/m)
Resistance PLR Models:	.058 ohms/ft. (.191 ohms/m)
Min. Bend Radius:	2.5 inches (6.4cm) Nominal
Diameter:	5/32 inch (4mm) Nominal
Weight:	8lbs./500 ft. (3.6 kg/152m)

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 since 1938.

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.

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, beam clamps, cable standoffs, connectors and zone boxes. Their proper use assures a neat and reliable installation. Only installation hardware supplied or recommended 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 (3x per meter). 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 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 PWSK-3 or PWSC Splicing Connectors. These devices are designed for this specific purpose and are the only approved methods of splicing the detector.

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.

Model Numbers, Temperature Ratings, and Approved Spacing

Product Type	Model Number	Alarm Temperature	Max. Ambient Temperature	UL/cUL Approval/ Max. Listed Spacing	FM Approval/ Max. Listed Spacing
PHSC-EPC Multi-Purpose/ Commercial & Industrial Applications	PHSC-155-EPC	155°F (68°C)	115°F (46°C)*	50 ft. / 15.2m	30 ft. / 9.1m
	PHSC-172-EPC	172°F (78°C)	130°F (54°C)	50 ft. / 15.2m	30 ft. / 9.1m
	PHSC-190-EPC	190°F (88°C)	150°F (66°C)	50 ft. / 15.2m	30 ft. / 9.1m
	PHSC-220-EPC	220°F (105°C)	175°F (79°C)*	50 ft. / 15.2m	25 ft. / 7.6m
	PHSC-280-EPC	280°F (138°C)	200°F (93°C)	50 ft. / 15.2m	25 ft. / 7.6m
	PHSC-356-EPC	356°F (180°C)	221°F (105°C)	50 ft. / 15.2m	See Note 1
PHSC-XCR High Performance/ Industrial Applications Excellent Abrasion & Chemical Resistance	PHSC-155-XCR	155°F (68°C)	115°F (46°C)*	50 ft. / 15.2m	30 ft. / 9.1m
	PHSC-172-XCR	172°F (78°C)	130°F (54°C)	50 ft. / 15.2m	30 ft. / 9.1m
	PHSC-190-XCR	190°F (88°C)	150°F (66°C)	50 ft. / 15.2m	30 ft. / 9.1m
	PHSC-220-XCR	220°F (105°C)	175°F (79°C)*	50 ft. / 15.2m	25 ft. / 7.6m
	PHSC-280-XCR	280°F (138°C)	200°F (93°C)	50 ft. / 15.2m	25 ft. / 7.6m
	PHSC-356-XCR	356°F (180°C)	250°F (121°C)	50 ft. / 15.2m	See Note 1
PHSC- LSZH Multi-Purpose/Low Smoke Zero Halogen	PHSC-135-LSZH	135°F (57°C)	100°F (38°C)	50 ft. / 15.2m	30 ft. / 9.1m
	PHSC-155-LSZH	155°F (68°C)	115°F (46°C)*	50 ft. / 15.2m	30 ft. / 9.1m
	PHSC-172-LSZH	172°F (78°C)	130°F (54°C)	50 ft. / 15.2m	30 ft. / 9.1m
	PHSC-190-LSZH	190°F (88°C)	150°F (66°C)	50 ft. / 15.2m	30 ft. / 9.1m
	PHSC-220-LSZH	220°F (105°C)	175°F (79°C)*	50 ft. / 15.2m	25 ft. / 7.6m
	PHSC-280-LSZH	280°F (138°C)	200°F (93°C)	50 ft. / 15.2m	25 ft. / 7.6m
	PHSC-356-LSZH	356°F (180°C)	250°F (121°C)	50 ft. / 15.2m	See Note 1
PHSC- XLT 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
PLR-EPR Good Weathering Properties & Flexibility Over a Wide Temperature Range	PLR-155-EPR	155°F (68°C)	115°F (46°C)*	50 ft. / 15.2m	30 ft. / 9.1m
	PLR-172-EPR	172°F (78°C)	130°F (54°C)	50 ft. / 15.2m	30 ft. / 9.1m
	PLR-190-EPR	190°F (88°C)	150°F (66°C)	50 ft. / 15.2m	30 ft. / 9.1m
PLR-XCR High Performance/ Industrial Applications Excellent Abrasion & Chemical Resistance	PLR-500-XCR	500°F (180°C)	392°F (200°C)	50 ft. / 15.2m	See Note 1

*For open area applications the recommended UL 521 maximum ambient temperature for all 155 models is 100°F (38°C), and 220 models is 150°F (66°C). Temperatures shown in table are acceptable for UL Special Application use. **PHSC-135°F XLT has been UL Listed and FM Approved for -60°F (-51°C).
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.