



# Protectowire FiberSystem 4000

## PFS Series Fiber Optic Sensor Cable



### Features

- Three models available.
- Immune to electromagnetic interferences.
- Withstands severe environmental conditions.
- Little or no maintenance required.
- Halogen free, flame retardant jacket.

### Description

Protectowire PFS Series Fiber Optic Sensor Cable measures temperatures by means of optical fibers functioning as linear sensors. Temperatures are monitored along the sensor cable as a continuous profile. This ensures highly accurate temperature discrimination over great distances or large surface areas. The sensor cable consists of a stainless steel tube with an outside diameter of 1.2 - 1.8 mm (.05 - .07 inches). In the tube are two independent color-coded quartz fibers that are encased in a special gel to ensure that the sensor fibers remain waterproof. Depending upon the model selected, the stainless steel tube is clad with a layer of stainless steel wire, aluminum wire or Aramid yarns. The sensor's core is then sheathed in a flame retardant black plastic jacketing material to a diameter of 4 mm (.16 inches).

### Applications

- Tunnels
- Cable trays
- Conveyors
- Power distribution apparatus: switchgear, transformers, motor control centers, power cables
- Cooling towers
- Mines
- Pipelines
- Bridges, piers, marine vessels
- Aircraft hangars

Today, fiber optic temperature sensors are used in a variety of special applications. Their unique characteristics make them adaptable for such varied uses as monitoring the curing of concrete, detecting road icing and leaks in pipelines, and monitoring power cables for overloads.

In the area of fire detection, fiber optic technology is ideally suited to industrial high-risk hazards as well as many types of commercial applications. Protectowire PFS Series Fiber Optic Sensor Cable has unique advantages over other types of detectors, especially when difficult installation factors or severe environmental conditions are present. When used with a Protectowire FiberSystem 4000 OTS Controller, temperature measurement on the Sensor Cable takes place at periodic intervals to provide a continuous temperature profile.

## Features & Benefits

- Identifies and displays the alarm location anywhere along its length when used with the unique visualization software and OTS Controller.
- Unique zoning capabilities. A single length of sensor can be divided into 128 zones for various requirements (e.g. video, ventilation, and extinguishment zones). Of these, 64 zones can be optionally subdivided again into a maximum of 10 sub-zones each (640 total).
- Multiple alarm initiating criteria by zone. Alarm initiating may be based upon a maximum temperature per zone, temperature development per zone in terms of time (rate-of-rise), or temperature difference between a measurement location and the zone average (zone differential).
- Reinforced stainless steel inner core and rugged flame retardant outer jacket provide resistance to mechanical damage.
- Simple to install. Can be field spliced with appropriate splicing tool. Junctions can be made without affecting the integrity of the system.

## Specifications

The PFS Series product range consists of three distinct types of Sensor Cable. Each type has a unique construction that has been designed to accommodate the widest range of installation requirements and environments. All product specifications are subject to change without notice.

**PFS-504-FR** - Type FR Sensor Cable consists of a stainless steel core tube that contains two independent color-coded quartz fibers each with an outside diameter of .25 mm (.01 inches). The tube cavity is filled with a water-free, heat conducting fill material to ensure that the optical fibers remain waterproof. The outside of the core tube is wrapped with a layer of fine stainless steel wires that improve heat response and add to the mechanical and tensile

strength of the cable. The sensor cable is then sheathed with a halogen free, flame retardant HM4 thermoplastic jacket suitable for a wide range of applications and environments.

**PFS-604-MF** - Type MF Sensor Cable is a metal free Sensor and has been specifically designed for use in applications where a high amount of electromagnetic disturbances are expected like tunnels, high voltage cable trays and transformers. To minimize the risk of induced voltages, the construction of the metal free Sensor Cable substitutes a polyamide core tube reinforced with Aramid yarn in place of the stainless steel tube and wire used in the FR type Sensor. The outer jacket consists of the same halogen free, flame retardant HM4 thermoplastic used throughout the product line. This series is best described as multi-purpose, and is well suited to a wide range of both commercial and industrial applications.

**PFS-348-EX** - Type EX Sensor Cable is specifically designed for use with the OTS Controllers containing Option D, EX-Zone Access. This system combination has been classified in accordance with ATEX Group II, Category 1G, "Increased Safety." The Sensor consists of a stainless steel core tube that contains four quartz glass fibers. Two of the fibers are available for temperature monitoring and two are intended to be used in a supervisory mode to shut down the OTS laser should the sensor cable become damaged or broken. Like all PFS Series Sensors, the core tube is filled with a hydrophobic gel to protect the fibers from water entry. The outside of the core tube is wrapped with a layer of aluminum wire that improves both the heat response, and the mechanical deflection characteristics of the cable. The sensor cable is jacketed with a halogen free, flame retardant HM4 thermoplastic material to a final diameter of 8 mm (.32 inches).

## Installation Accessories

A comprehensive range of mounting and installation accessories are available for the installation of Protectowire Type FR and MF Fiber Optic Sensor Cables. 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. For information on installation accessories for Type EX Sensor Cable, designed for hazardous locations, consult the Factory. Only installation hardware supplied or approved by The Protectowire Company should be used.

Cable Type	PFS-504-FR	PFS-604-MF	PFS-348-EX
Number of fibers	2	2	4
Diameter	4 mm (.16 inches)	4 mm (.16 inches)	8 mm (.32 inches)
Min. bend radius	60 mm (2.4 inches)	60 mm (2.4 inches)	80 mm (3.2 inches)
Temperature Range	-40° to 85° C (-40° to 185° F)	-40° to 85° C (-40° to 185° F)	-40° to 85° C (-40° to 185° F)
Cable Weight	44 kg/km (30 lbs./1,000 ft.)	18 kg/km (12 lbs./1,000 ft.)	50 kg/km (34 lbs./1,000 ft.)

Only Protectowire PFS Fiber Optic Sensor Cables comply with the manufacturer's requirements for calibration and compatibility with FiberSystem 4000 OTS Controllers. The use of any other fiber optic cable or sensor on this system is considered a misapplication of the product and will void all warranties either expressed or implied.