S200XA Linear Heat Series Sensor Cables

Fike's fiber-optic sensing technology provides gapless fire detection and maintenance-free monitoring in even the harshest environments.

Unlike traditional fire detection systems, Fike’s fiber optic Linear Heat Detection system (LHD) continuously and actively monitors the real-time temperature at every point along an asset, precisely detecting and locating hotspots or fires within a minimum virtual zone size of 6 linear feet.

A laser pulse emitted from the LHD controller travels through a single optical fiber, light is scattered back, carrying temperature information along the route. The exact position of the temperature reading is determined by the arrival time of the returning light pulse.

With one single passive fiber optic cable, the temperature of an entire assist is monitored continuously. The sensor cable can be flexibly divided into custom alarm zones, each with individually-defined alarm thresholds monitoring fixed temperature and rate of rise signatures.

If an alarm is triggered by the LHD controller, the information will be immediately transmitted to the fire control panel. Fike's sensing cables can monitor temperatures of up to 750 degrees C, so the operator has full visibility of the fire size and how it spreads, while first responders are on the way.

The fiber optic LHD system uses a very low powered laser, that makes the system inherently safe to use even in hazardous environments - such as petrochemical plants, combustible dust hazards or mining shafts.

Fiber optic LHD offers a huge advantage in monitoring transportation infrastructure such as conveyor belts and various industrial application areas, aircraft hangars and warehouses. Fike’s LHD solution offers the most complete set of fire certifications and is well suited to the needs of your asset. More information is available in the data sheets below.

DATA SHEET

S200XA Linear Heat Series Sensor Cables

Multimode, Flame-Retardant, Non-Corrosive (FRNC)

Two types of multi-mode, fiber-optic sensor cables are available for use with the N43 and N45 Series Distributed Temperature Sensor (DTS) controllers – Sensor Cable Safety and Sensor Cable Steel. Both cables have two fiber cores covered by polyacrylate, with an outer cable sheath made of a halogen-free, flame retardant, non-corrosive polyethylene-based compound.

The **Sensor Cable Safety (S2000A)** is a fast-responding sensor cable with a tight-buffered fiber, compact dimensions, high flexibility, and good bending behavior. The Aramid yarn surrounding the fibers offers good rodent protection and withstands high tensile loads.

The **Sensor Cable Steel (S2002A and S2002A-RED)** are fast-responding sensor cables with stainless steel loose tubes and outer sheath. This design offers high tensile strength, high crush resistance, good rodent protection, and is longitudinally and laterally watertight.

Sensor Cable Safety S2000A

Sensor Cable Steel
S2002A and S2002A-RED

ORDERING

PART NUMBER	DESCRIPTION
S2000A	Sensor Safety Cable
S2002A	Sensor Cable Steel
S2002A-RED	Sensor Cable Steel, red outer sheath, for use with DTS system
S2000A-001	Sensor Safety Cable with 2 x pigtail with E2000 8° APC connectors[1] pre-assembled on one cable end. Provides splice protection and strain relief.
S2002A-001	Sensor Cable Steel with 2 x pigtail with E2000 8° APC connectors[1] pre-assembled on one cable end. Provides splice protection and strain relief.
S2008A	Pigtail with E2000 8° APC Connector for splicing to the sensor fiber, 5 m length. Used for connection to DTS or termination.
S2006A	Pigtail with E2000 8° APC Connector for splicing to the sensor fiber, 3 m length. Used for connection to DTS or termination.
S2011A	E2000 APC Adapter for connecting two E2000 APC connectors
S2010A	Sensor (fiber) cutting tool. Used to cut the stainless steel tube, cable sheath removal, and splicing the pigtail to the sensor fiber.

[1] Pre-assembled sensor cable connectors are optionally available to reduce deployment cost and time. The connectors are covered with a flexible protective tube when shipped for safe transport.

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SPECIFICATIONS

Fiber Cables			
Cable Type	S2000A	S2002A	S2002A-RED
Cable Version	Safety	Steel armored	
Outer Sheath Material	Flame retardant, non-corrosive (FRNC)		
Armoring	Swellable aramid yarns (metal free)	Stainless steel AISI 316L tube Stainless steel AISI 316L wires	
Cable Design	GRP strength member, fiber tight-buffered in aramid yarn	Gel-free, fiber loose in FIMT (fiber in a metal tube)	
Standard Fiber Count / Cable	2 MM		
UV-Resistance	Yes		
Longitudinal Water Resistant	No	Yes	
Approximate Weight[1]	17 kg/km (11.4 lb/ft)	29 kg/km (19.5 lb/ft)	
Outer Diameter[1]	4 mm (0.16 in)	3.8 mm (0.15 in)	
Crush Resistance[2]	1,000 N/10 cm	9,600 N/10 cm[4]	
Tensile Strength (installation)[2]	1,000 N	800 N	
Tensile Strength (operation)[2]	800 N		
Operating Temperature	-40°C to +85°C (-40°F to +185°F)		
Short Term Temperature	-40°C to +150°C (-40°F to +302°F)		
Functional Integrity[3]	up to +750°C (+1,382°F)		
Optical Details			
MM Attenuation	OM2		
850 nm Wavelength	Maximum 2.7 dB/km / Average 2.5 dB/km		
1300 nm Wavelength	Maximum 0.8 kB/km / Average 0.7 kB/km		
Installation Details			
Outer Diameter[1]	4 mm (0.16 in)	3.8 mm (0.15 in)	
Static Bending Radius[2]	15 x D (outer Ø)		
Repeated Bending[2]	20 x D (outer Ø)		
Installation Temperature	-5°C to +50°C (23°F to +122°F)		
Certifications and Approvals			
IEC	IEC 60331-25 [2] IEC 60332-1/-2/-3-24 IEC 60754-1/-2 IEC 60793 IEC 60794-1-2 IEC 61034-2		
EN	EN 187000		
VDS	EN 54-5 / A1		
UL	UL 521		
ULC/CAN	ULC S530		
FM	FM 3210		

[1] Tolerance of -5% / +10%

[2] Crush resistance IEC 60794-1-2, method E3A; Tensile strength short term (installation) IEC 60794-1-2, method E1 A/B; Tensile strength long term (operation) IEC 60794-1-2, method E1 A/B; Static bend radius IEC 60794-1-2, method E11; Repeated bending IEC 60794-1-2, method E6.

[3] The functional integrity of the sensor cable was tested for 2 hours with min. flame temperature of 750°C as per IEC 60331-25. The functional integrity of the cable was maintained for several minutes in tunnel fire testing with temperatures exceeding 1000°C.

[4] 600 N/cm in operation / max. 960 N/cm during installation.

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DATA SHEET

N4387B Linear Heat Series Detection System

The N4387B Linear Heat Series is a fiber-optic linear heat detection system that can monitor several kilometers of fiber-optic cable, providing a continuous temperature profile along the entire length. A maximum of four sensor channels can be added to the unit to provide either four independent sensor channels or two independent sensor channels with redundant pathways. The unit is available in a 19-inch rack-mount enclosure (standard) or an IP66-rated outdoor enclosure.

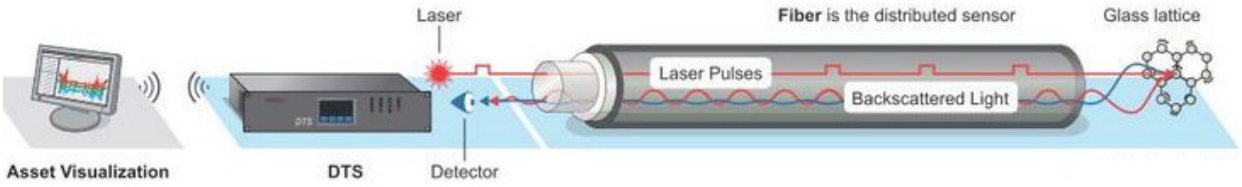
The system is especially suited for harsh conditions like dirt, dust, humidity, electromagnetic or radioactive conditions, and for monitoring objects with high danger potential. It is also well suited for large-scale installations like transport tunnels, cable trays, conveyor belts, and large-scale building structures.

H01D 19 inch Rack Model

HW2D Outdoor Housing (IP66) with Window

OPERATING PRINCIPLE

Each unit has an integral low-power laser source that generates an optical laser pulse that is sent through the fiber-optic cables. Some of the light from the optical laser pulse is scattered and reflected back to the unit. The unit analyzes the intensity of the returning optical signal for amplitude changes, indicating a temperature change along the sensor cable. The position of the temperature reading along the length of the fiber-optic cable is determined by measuring the arrival time of the returning light pulse, similar to a radar echo.



SPECIFICATIONS

Base Unit		
Minimum Sampling Interval	0.25 m	
Available Spatial Resolution	0.5 m to 8.0 m (adjustable	
Channel Options	1 (N4387B-100) 2 (N4387B-200) 4 (N4387B-400)	
Available Measurement Time	10 s to 30 s (adjustable)	
Available Measurement Modes	Single-ended (all controllers) Dual-ended loop with fiber break recovery (not on N4387B-100)	
Average laser output power	< 20 mW	
Fire Certifications	EN54-22 (VdS) UL 521 ULC S530 FM	
ATEX Certifications	EX 11 (1) GD; | M2	
Interfaces		
Optical Connector / Sensor Fiber	E2000 APC, 8° angled / 50/125 µm graded index MM	
Computer Interface	USB, Ethernet (LAN)	
Communication Protocol	SCPI; Modbus TCP (N4387B-060)	
Relay Board	4 opto-coupled reset inputs, 43 volt-free configurable outputs (N4387B-051)	
Power Supply		
Operating Voltage	10 V DC to 30 V DC	
Power Consumption at 20°C (68°F)	17 W average; <40 W maximum (all operating conditions)	
Housing and Environmental Conditions		
Housing Option	19” rack mount (N4387B-H01D)	Outdoor enclosure (N4387B-HW2D)
Operating Temperature Range	-10°C to +60°C (14°F to +140°F)	
Storage Temperature Range	-40°C to +80°C (-40°F to +176°F)	
Operating Humidity Range	0% to 95% relative humidity, non-condensing	
Dimensions (H x W x D)	88 x 450 x 390 mm (3.46 x 17.72 x 15.35 in.)	500 x 400 x 150 mm (19.69 x 15.75 x 5.91 in.)
Weight	9 kg (19.84 lbs.)	17 kg (37.48 lbs.)
Certifications	EN54-22 (VdS) UL 521 ULC S530 FM	

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ORDERING

A base unit, sensor channel card, optional cards, and enclosure option must be ordered for a complete system.

PART NUMBER	DESCRIPTION					
BASE UNIT						
N4387B-XXX	Distributed Temperature Sensor unit (**–XXX** = units maximum measurement range)					
	-001	**-002**	**-004**	**-006**	**-008**	**-010**
	1 km	2 km	4 km	6 km	8 km	10 km
SENSOR CHANNELS[1] [4]						
N4387B-100	1 sensor channel with E2000 8° angle APC optical connectors[3]					
N4387B-200	2 sensor channels with E2000 8° angle APC optical connectors[3]					
N4387B-400	4 sensor channels with E2000 8° angle APC optical connectors[3]					
OPTIONAL CARDS[1]						
N4387B-051	Relay board with 43 configurable alarm outputs[2]					
N4387B-060	Modbus TCP/IP Interface (used to connect the unto to management systems)					
ENCLOSURE OPTIONS						
N4387B-H01D	Indoor housing, 19” rack mount, 2HU [2] - Multicolor LCD - (HxWxD) 88 x 448 x 364 mm - 9 kg (complete instrument)					
N4387B-H02D	Outdoor housing, IP66 / NEMA 4-rated, wall mount - Multicolor LCD - Coated steel, RAL 7035 - 4 x Pflitsch UNI Dicht 32 mm cable glands - (HxWxD) 500 x 400 x 150 mm - 4 x wall holder - 17 kg (complete instrument)					
N4387B-H03D	Outdoor housing, IP66 / NEMA 4-rated, wall mount - Multicolor LCD - SST, gas-tight - 4 x Hawke 20 mm cable glands - 1 x Harting LAN connector - (HxWxD) 500 x 400 x 150 mm - 4 x wall holder - 17 kg (complete instrument)					
N4387B-H07D	Outdoor housing, IP66 / NEMA 4-rated, wall mount - Multicolor LCD - SST - 2 x Pflitsch UNI Dicht 32 mm cable glands - (HxWxD) 500 x 400 x 150 mm - 4 x wall holder - 17 kg (complete instrument)					
N4387B-HW2D (recommended)	Outdoor housing, IP66 / NEMA 4-rated, wall mount, with window - Multicolor LCD - Coated Steel, RAL 7035 - 4 x Pflitsch UNI Dicht 32 mm cable glands - (HxWxD) 500 x 400 x 150 mm - 4 x wall holder - 17 kg (complete instrument)					

[1] Mounted internally in the unit.
[2] Standard unit component. No additional charge if ordered.
[3] Suitable for multi-mode GI 50/125 µm fiber.
[4] One sensor channel is required on each unit.

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