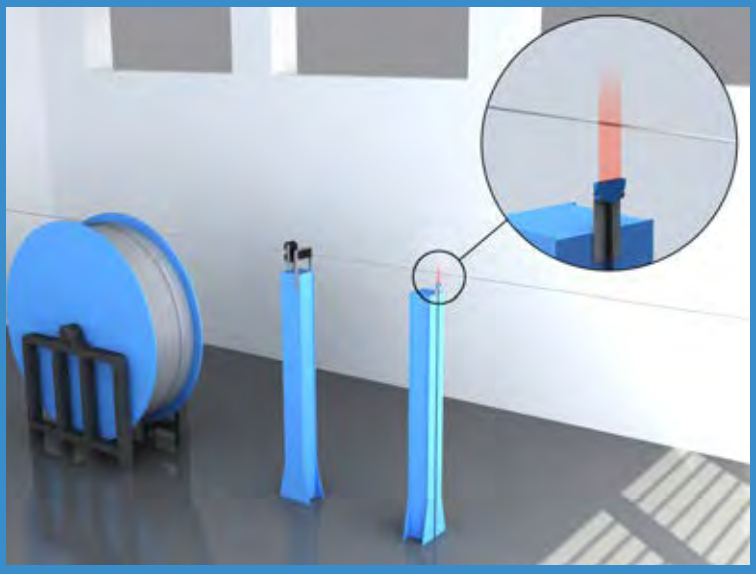


APPLICATION

Photoelectric fiber-optic sensor detects broken parking-brake cable during manufacture

During manufacture of automotive parking-brake cable, multiple strands of steel wire are twisted together, forming a single cable. After twisting, cable passes to the next process in an unsupported, continuous length. Occasionally, the cable breaks, compromising safety and damaging equipment. Although the cable's exact path is unpredictable, a multi-beam fiber-optic sensor detects its presence, interrupting the process if it breaks.

INDUSTRIES

Packaging, logistics, materials handling, robotics, precision engineering, printed circuit board production, electronics, vending machines, special machinery, quality control

Printed circuit board production

Presence sensing by industrial robot

Packaging systems

Robotics

FIBER-OPTIC
PHOTOELECTRIC SENSORS
RELIABLE SHORT- AND LONG-RANGE SENSING

With self-contained fiber-optic sensors available in housings as small as 30 x 30 x 15 mm, and several models of small DIN-rail mounted amplifiers that accommodate multiple-sensor applications, the Contrinex range is highly versatile. A choice of **synthetic** or **glass optical fibers** provides options for even the most demanding applications.

KEY ADVANTAGES

Fiber-optic sensors

- ✓ Robust 3030 series (30 x 30 x 15 mm)
- ✓ DIN-rail mounted 3060 series (31 x 60 x 10 mm) suitable for multiple-sensor applications
- ✓ Distance setting by potentiometer or teach-in
- ✓ IO-Link

Fibers

- ✓ Large selection of types, including cylindrical light beam, multi-beam and low & high temperature
- ✓ Diffuse or through-beam sensing, axial or radial
- ✓ Synthetic fibers with bending radii from 2 mm, suitable for cutting on-site
- ✓ Glass fibers for high temperatures and aggressive environment

PRODUCT OVERVIEW

IO-Link

SERIES Housing size mm	3030 □ 30 × 30 × 15	3060 □ 30 × 60 × 10
Fiber-optic amplifier (s_n mm)	60 / 120	200

OPTICAL FIBERS OVERVIEW

Housing size		Ø2.3 mm	M3	Ø3.2 mm	M4	Ø4.5 mm	M5	M6	□ 18 × 32 mm
Synthetic fibers	Diffuse	p. 168	p. 168			p. 170	p. 170	p. 168, 172	p. 168
	Through-beam		p. 170	p. 170	p. 172			p. 174	
Glass fibers	Diffuse							p. 170	
	Through-beam				p. 174				

COMMON FEATURES

Supply Voltage range	10 … 36 VDC

OUTPUT

Sensor type
[F] Fiber amplifier

[0] High performance [1] Standard

L[x][x]-303[x]-[xxx] see p. 197

Connection
[K] Cable [S] Connector

Reference key on page 197

OPERATING PRINCIPLE

Diffuse

Through-beam

ACCESSORIES

A **Group A: M8 3-pin**
Sub-group: Field attachable connectors
Sub-group: Distribution boxes

B **Group B: M8 4-pin**
Sub-group: Field attachable connectors

C **Group C: M12 4-pin**
Sub-group: Field attachable connectors
Sub-group: Distribution boxes

D **Group D: M12 AC/DC 3-pin**

E **Group E: Universal mounting brackets**
Sub-group: Mechanical stops

F **Group F: Photoelectric mounting brackets**

G **Group G: Photoelectric reflectors**

H **Group H: Sensor tester**

Go to page 298 for details

CABLES

Cable lengths available:
2 m, 5 m, 10 m
other customised lengths possible

CUBIC 3030
3030 SERIES
AMPLIFIER

FAMILY	OPERATING PRINCIPLE	SENSING RANGE (mm)	HOUSING SIZE (mm)	LIGHT SOURCE
CUBIC 3030 – 3030 SERIES	(dependent on selected optical fiber)	60	30 × 30	LED, red 660 nm
		60	30 × 30	LED, red 660 nm
		60	30 × 30	LED, red 660 nm
		60	30 × 30	LED, red 660 nm
		60	30 × 30	LED, red 660 nm
		60	30 × 30	LED, red 660 nm
		60	30 × 30	LED, red 660 nm
		60	30 × 30	LED, red 660 nm
		120	30 × 30	LED, red 660 nm
		120	30 × 30	LED, red 660 nm
		120	30 × 30	LED, red 660 nm
		120	30 × 30	LED, red 660 nm

KEY ADVANTAGES

- ✓ Fiber-optic amplifiers in rugged Crastin housing 30 × 30 × 15 mm
- ✓ Shock and vibration resistant due to fully potted electronics
- ✓ Sensing range up to 120 m

	HOUSING MATERIAL	CABLE	CONNECTOR	IO-Link	SWITCHING FREQUENCY	AMBIENT TEMPERATURE	DEGREE OF PROTECTION	PART REFERENCE	ACCESSORIES (SEE PAGE 164)
	PBTP (Crastin)	PVC			1,000	−25 … +55°C	IP67	**LFK-3031-301**	F H
	PBTP (Crastin)	PVC			1,000	−25 … +55°C	IP67	**LFK-3031-302**	F H
	PBTP (Crastin)		M8		1,000	−25 … +55°C	IP67	**LFS-3031-301**	A F H
	PBTP (Crastin)		M8		1,000	−25 … +55°C	IP67	**LFS-3031-302**	A F H
	PBTP (Crastin)	PVC			1,000	−25 … +55°C	IP67	**LFK-3031-303**	F H
	PBTP (Crastin)	PVC			1,000	−25 … +55°C	IP67	**LFK-3031-304**	F H
	PBTP (Crastin)		M8		1,000	−25 … +55°C	IP67	**LFS-3031-303**	A F H
	PBTP (Crastin)		M8		1,000	−25 … +55°C	IP67	**LFS-3031-304**	A F H
	PBTP (Crastin)	PVC			1,000	−25 … +55°C	IP67	**LFK-3030-101**	F H
	PBTP (Crastin)		M8		1,000	−25 … +55°C	IP67	**LFS-3030-101**	B F H
	PBTP (Crastin)	PVC			1,000	−25 … +55°C	IP67	**LFK-3030-103**	F H
	PBTP (Crastin)		M8		1,000	−25 … +55°C	IP67	**LFS-3030-103**	B F H

COMMON FEATURES

Supply Voltage range	10 … 30 VDC

OUTPUT

Sensor type
[F] Fiber amplifier

[0] Red light [3] Blue light

L[x][x]-3[x]6[x]-[xxx] — see p. 197

Connection
[K] Cable [S] Connector

[0] Potentiometer
[5] Teach
[6] Digital display

Reference key on page 197

OPERATING PRINCIPLE

Diffuse

Through-beam

ACCESSORIES

A **Group A: M8 3-pin**
Sub-group: Field attachable connectors
Sub-group: Distribution boxes

B **Group B: M8 4-pin**
Sub-group: Field attachable connectors

C **Group C: M12 4-pin**
Sub-group: Field attachable connectors
Sub-group: Distribution boxes

D **Group D: M12 AC/DC 3-pin**

E **Group E: Universal mounting brackets**
Sub-group: Mechanical stops

F **Group F: Photoelectric mounting brackets**

G **Group G: Photoelectric reflectors**

H **Group H: Sensor tester**

Go to page 298 for details

CABLES

Cable lengths available:
2 m, 5 m, 10 m
other customised lengths possible

CUBIC 3060
3060 SERIES
AMPLIFIER

FAMILY	OPERATING PRINCIPLE	SENSING RANGE (mm)	HOUSING SIZE (mm)	LIGHT SOURCE
CUBIC 3060 – 3060 SERIES	or (dependent on selected optical fiber)	100	31 × 60	LED, blue 465 nm
		100	31 × 60	LED, blue 465 nm
		100	31 × 60	LED, blue 465 nm
		100	31 × 60	LED, blue 465 nm
		200	31 × 60	LED, red 680 nm
		200	31 × 60	LED, red 680 nm
		200	31 × 60	LED, red 680 nm
		200	31 × 60	LED, red 680 nm
		200	31 × 60	LED, red 680 nm
		200	31 × 60	LED, red 680 nm
		200	31 × 60	LED, red 680 nm
		200	31 × 60	LED, red 680 nm
		200	31 × 60	LED, red 680 nm
		200	31 × 60	LED, red 680 nm
		200	31 × 60	LED, red 680 nm
		200	31 × 60	LED, red 680 nm

KEY ADVANTAGES

- ✓ Complete series of fiber-optic amplifiers for plastic fibers and DIN-rail mounting
- ✓ Small housings 31 × 60 × 10 mm
- ✓ Sensing ranges up to 200 mm
- ✓ IO-Link
- ✓ Blue light version for glass detection

	HOUSING MATERIAL	CABLE	CONNECTOR	IO-Link	SWITCHING FREQUENCY	AMBIENT TEMPERATURE	DEGREE OF PROTECTION	PART REFERENCE	ACCESSORIES (SEE PAGE 166)
	PBTP (Crastin)	PVC			1,500	−25 … +55°C	IP64	**LFK-3360-101**	H
	PBTP (Crastin)		M8		1,500	−25 … +55°C	IP64	**LFS-3360-101**	B H
	PBTP (Crastin)	PVC			1,500	−25 … +55°C	IP64	**LFK-3360-103**	H
	PBTP (Crastin)		M8		1,500	−25 … +55°C	IP64	**LFS-3360-103**	B H
	PBTP (Crastin)	PVC			1,500	−25 … +55°C	IP64	**LFK-3065-101**	H
	PBTP (Crastin)		M8		1,500	−25 … +55°C	IP64	**LFS-3065-101**	B H
	PBTP (Crastin)	PVC			1,500	−25 … +55°C	IP64	**LFK-3065-103**	H
	PBTP (Crastin)		M8		1,500	−25 … +55°C	IP64	**LFS-3065-103**	B H
	PBTP (Crastin)	PVC			1,500	−25 … +55°C	IP64	**LFK-3060-101**	H
	PBTP (Crastin)		M8		1,500	−25 … +55°C	IP64	**LFS-3060-101**	B H
	PBTP (Crastin)	PVC			1,500	−25 … +55°C	IP64	**LFK-3060-103**	H
	PBTP (Crastin)		M8		1,500	−25 … +55°C	IP64	**LFS-3060-103**	B H
	PBTP (Crastin)	PVC			4,000	−25 … +55°C	IP64	**LFK-3066-101**	H
	PBTP (Crastin)		M8		4,000	−25 … +55°C	IP64	**LFS-3066-101**	B H
	PBTP (Crastin)	PVC		IO-Link	4,000	−25 … +55°C	IP64	**LFK-3066-403**	H
	PBTP (Crastin)		M8	IO-Link	4,000	−25 … +55°C	IP64	**LFS-3066-403**	B H

FIBERS
SYNTHETIC & GLASS

OUTPUT

L[x][x]-[xxxx]-[xxx]-[xxx]

- [x] Sensor type: [F] Fiber amplifier — see p. 197
- [xxxx] — see p. 197
- [xxx] — see p. 197
- [x] [G] Glass optical fiber, [P] Synthetic optical fiber

Reference key on page 197

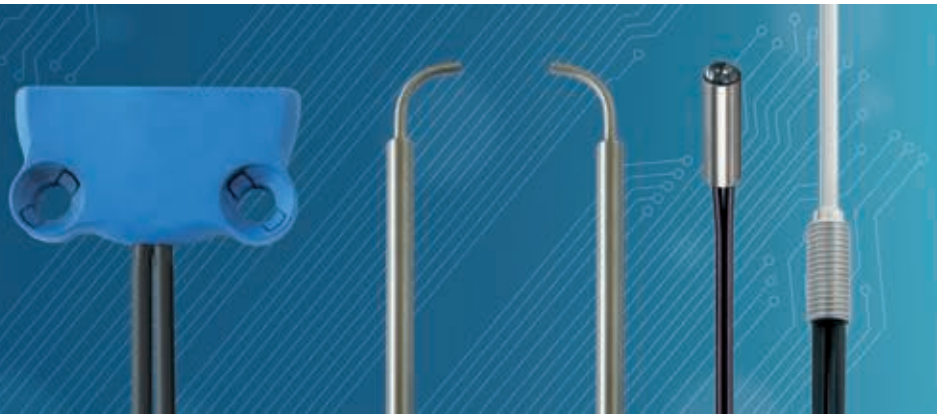
OPERATING PRINCIPLE

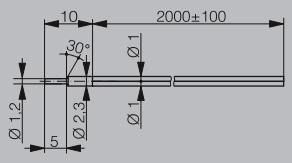
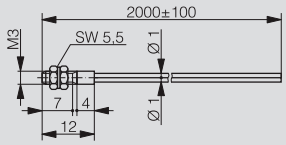
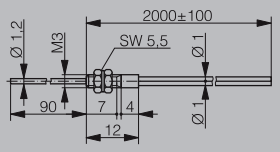
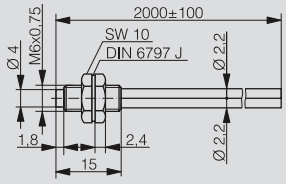
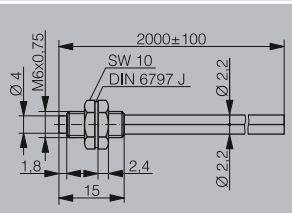
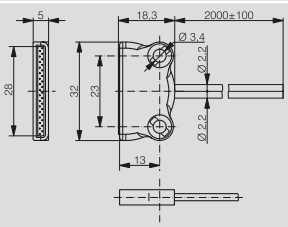
- Diffuse
- Through-beam

FAMILY	OPERATING PRINCIPLE	SENSING RANGE (mm)	FIBER MATERIAL	HOUSING SIZE (mm)
OPTICAL FIBERS		40	Plastic	∅ 2.3
		40	Plastic	M3
		40	Plastic	M3
		90	Plastic	M6
		90	Plastic	M6
		90	Plastic	18 × 32

KEY ADVANTAGES

- ✓ Very small dimensions
- ✓ Long sensing ranges
- ✓ Small bending radii
- ✓ Can be cut on site
- ✓ Large selection of types
- ✓ Mechanically rugged sensing head



CABLE LENGTH	SLEEVE MATERIAL	TEMPERATURE RANGE	TECHNICAL DRAWING	PART REFERENCE
2 m	PE	−25 … +70°C		LFP-1012-020
2 m	PE	−25 … +70°C		LFP-1001-020
2 m	PE	−25 … +70°C		LFP-1004-020
2 m	PE	−25 … +70°C		LFP-1102-020
2 m	PE	−55 … +105°C		LFP-1002-020-002
2 m	PE	−25 … +70°C		LFP-1011-020

OUTPUT

Sensor type
[F] Fiber amplifier

see p. 197

L[x][x]-[xxxx]-[xxx]-[xxx] see p. 197

[G] Glass optical fiber see p. 197
[P] Synthetic optical fiber

Reference key on page 197

OPERATING PRINCIPLE

Diffuse

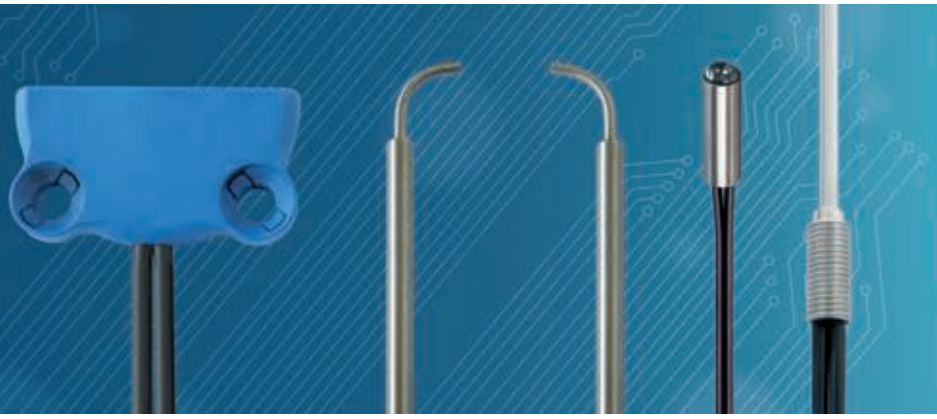
Through-beam

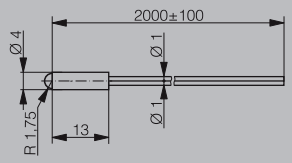
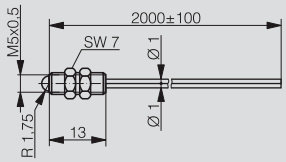
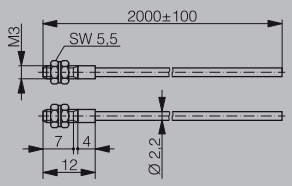
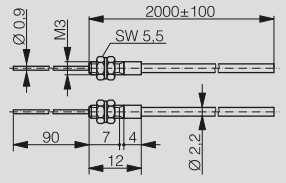
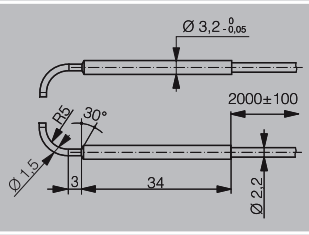
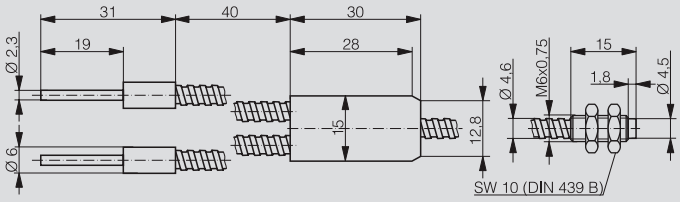
FIBERS
SYNTHETIC & GLASS

FAMILY	OPERATING PRINCIPLE	SENSING RANGE (mm)	FIBER MATERIAL	HOUSING SIZE (mm)
OPTICAL FIBERS		100	Plastic	∅ 4.5
		100	Plastic	M5
		120	Plastic	M3
		120	Plastic	M3
		120	Plastic	∅ 3.2
		120	Glass	M6

KEY ADVANTAGES

- ✓ Very small dimensions
- ✓ Long sensing ranges
- ✓ Small bending radii
- ✓ Can be cut on site
- ✓ Large selection of types
- ✓ Mechanically rugged sensing head



CABLE LENGTH	SLEEVE MATERIAL	TEMPERATURE RANGE	TECHNICAL DRAWING	PART REFERENCE
2 m	PE	–25 … +70°C		LFP-1006-020
2 m	PE	–25 … +70°C		LFP-1007-020
2 m	PE	–25 … +70°C		LFP-2001-020
2 m	PE	–25 … +70°C		LFP-2003-020
2 m	PE	–25 … +70°C		LFP-2006-020
0.5 m	Brass sleeve	–25 … +160°C		LFG-1022-050

OUTPUT

L[x][x]-[xxxx]-[xxx]-[xxx]

- [x] Sensor type: [F] Fiber amplifier
- [xxxx]: see p. 197
- [xxx]: see p. 197
- [xxx]: see p. 197
  - [G] Glass optical fiber
  - [P] Synthetic optical fiber

Reference key on page 197

OPERATING PRINCIPLE

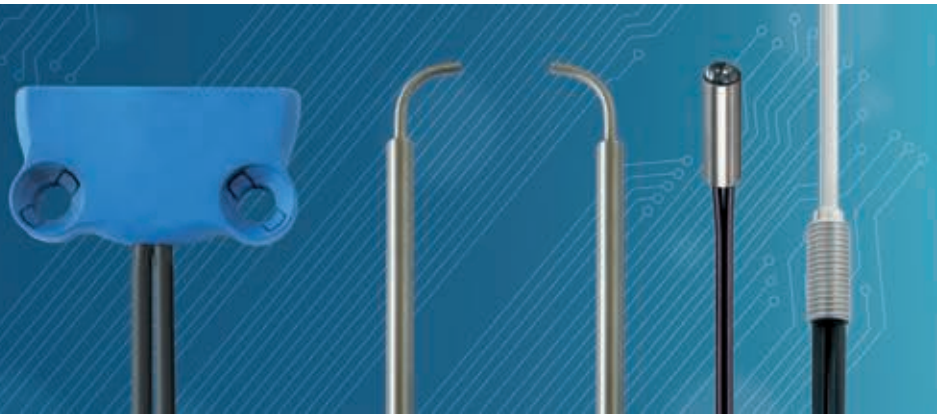
- Diffuse
- Through-beam

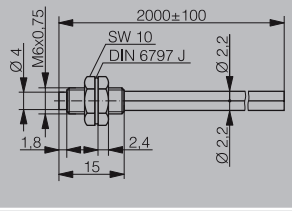
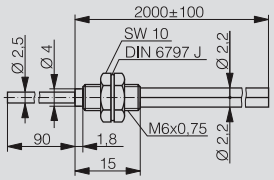
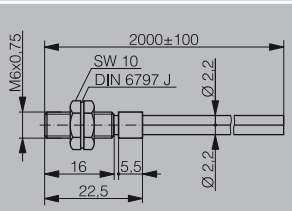
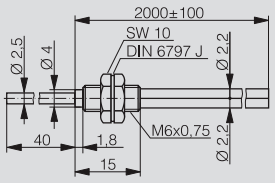
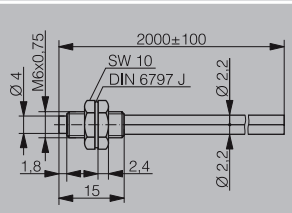
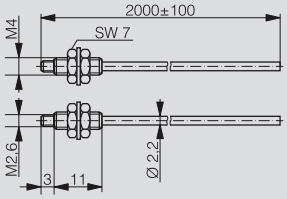
FIBERS
SYNTHETIC & GLASS

FAMILY	OPERATING PRINCIPLE	SENSING RANGE (mm)	FIBER MATERIAL	HOUSING SIZE (mm)
OPTICAL FIBERS	Diffuse	120	Plastic	M6
	Diffuse	120	Plastic	M6
	Diffuse	120	Plastic	M6
	Diffuse	120	Plastic	M6
	Diffuse	150	Plastic	M6
	Through-beam	300	Plastic	M4

KEY ADVANTAGES

- ✓ Very small dimensions
- ✓ Long sensing ranges
- ✓ Small bending radii
- ✓ Can be cut on site
- ✓ Large selection of types
- ✓ Mechanically rugged sensing head



CABLE LENGTH	SLEEVE MATERIAL	TEMPERATURE RANGE	TECHNICAL DRAWING	PART REFERENCE
2 m	PE	–25 … +70°C		LFP-1002-020
2 m	PE	–25 … +70°C		LFP-1005-020
2 m	PE	–25 … +70°C		LFP-1003-020
2 m	PE	–25 … +70°C		LFP-1013-020
2 m	PE	–25 … +70°C		LFP-1202-020
2 m	PE	–25 … +70°C		LFP-2102-020

OUTPUT

Sensor type
[F] Fiber amplifier

see p. 197

L[x][x]-[xxxx]-[xxx]-[xxx] see p. 197

[G] Glass optical fiber see p. 197
[P] Synthetic optical fiber

Reference key on page 197

OPERATING PRINCIPLE

Diffuse

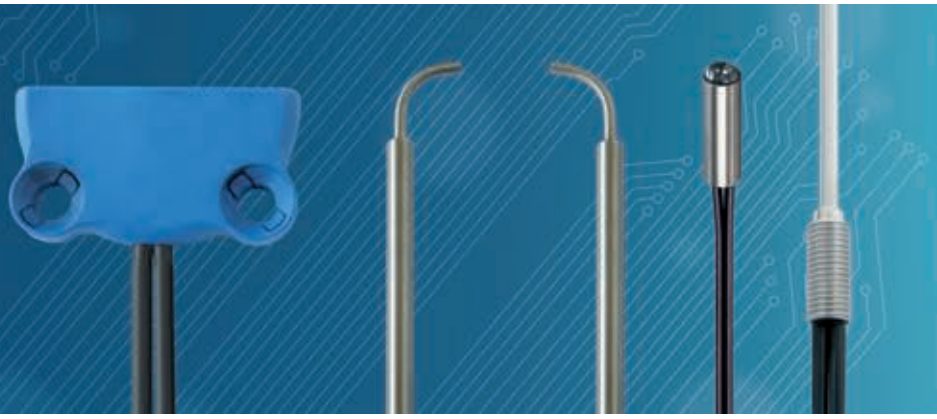
Through-beam

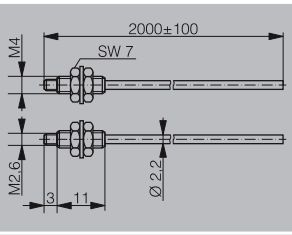
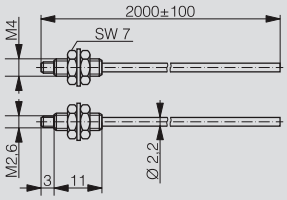
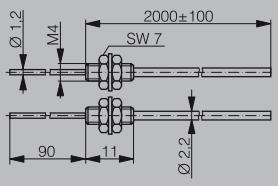
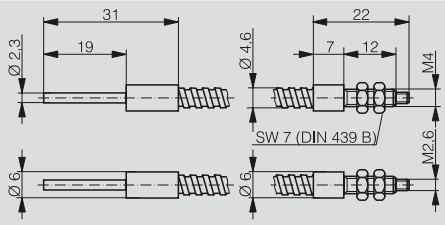
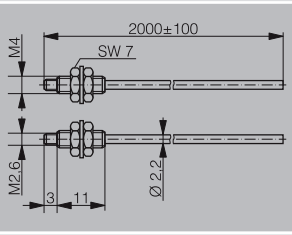
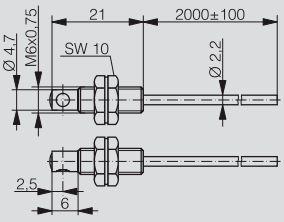
FIBERS
SYNTHETIC & GLASS

FAMILY	OPERATING PRINCIPLE	SENSING RANGE (mm)	FIBER MATERIAL	HOUSING SIZE (mm)
OPTICAL FIBERS		300	Plastic	M4
		400	Plastic	M4
		400	Plastic	M4
		500	Glass	M4
		500	Plastic	M4
		1,100	Plastic	M6

KEY ADVANTAGES

- ✓ Very small dimensions
- ✓ Long sensing ranges
- ✓ Small bending radii
- ✓ Can be cut on site
- ✓ Large selection of types
- ✓ Mechanically rugged sensing head



CABLE LENGTH	SLEEVE MATERIAL	TEMPERATURE RANGE	TECHNICAL DRAWING	PART REFERENCE
2 m	PE	−55 … +105°C		LFP-2002-020-002
2 m	PE	−25 … +70°C		LFP-2002-020
2 m	PE	−25 … +70°C		LFP-2004-020
0.5 m	Brass sleeve	−25 … +160°C		LFG-3022-050
2 m	PE	−25 … +70°C		LFP-2202-020
2 m	PE	−25 … +70°C		LFP-2005-020