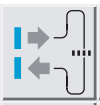
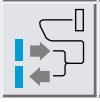
LL 3
Plastic Fiber-Optic Cables – Flexible in Every Sense of the Word

	**Fiber-optic cable through-beam systems**
	**Fiber-optic cable scanner systems**

No assembly space – not even for miniature photoelectric cables, chemical corrosion or increased ambient temperatures are often decisive reasons for the use of LL 3 plastic fiber-optic cables. In connection with the photoelectric switch series WLL 160(T), LL 3 cables enable reliable object detection even under difficult conditions.

Their multifaceted flexibility says a lot about the LL 3: small bending radii, simple shortening to the required length and different terminal sleeves make it possible to connect and lay them easily.

Their great variety is another factor: a total of approximately 50 different models of the LL 3 provide optimum alternatives for almost all applications from optical, mechanical and chemical standpoints. Various tip adapters make additional applications possible. The LL 3 fiber-optic cables and the corresponding photoelectric fiber-optic switches from SICK create a strong team. They are especially useful in the semi-conductor, electronics assembly, packaging, handling and assembly systems, special mechanical engineering and precision engineering.

LL 3 options:
- Standard fiber-optic cables
- Large scanning ranges
- Tip adapters
- Small terminal sleeves
- Highly flexible with the smallest bending radii
- Integrated 90° offset
- Temperature resistant to 180 °C
- Teflon coating against aggressive environments
- Coaxial structure
- Pliable terminal sleeves
- 10 m length
- Fiber-optic lines
- Level switch ...

Fiber-optic cable scanner system

Characteristics

- Highly flexible
- Small bending radii
- Fiber-optic cables can be shortened easily with cuting device (supplied with equipment)
- Operation temperature –40 … +70 °C
  Special models to 180 °C

Selection table: sensors, fiber-optic cables, scanning distances

Scanner systems

Scanning distances SD[1] and minimum object diameter MO[7] in mm in connection with sensor type

LL 3 Fiber-optic cables				WLL 160 Red light		WLL 160 T Red light (NORM/MAX)		WLL 160 T Red light (FAST)	
Description	Bending radius mm	Type	Order no.	SD	MO	SD	MO	SD	MO
Compact sleeve, M 4, large scanning distance	25	LL 3-DM 01	5 308 071	70	0.015	70	0.015	50	0.015
Super compact sleeve, ø 2.5 mm	15	LL 3-DT 03	5 308 072	20	0.015	20	0.015	14	0.015
Super compact, sleeve M 3	10	LL 3-DS 06	5 308 073	20	0.015	20	0.015	14	0.015
Large scanning distance, M 6, coaxial fiber-optic cable	25	LL 3-DB 01	5 308 074	70	0.02	70	0.015	50	0.015
Length 10 m, M 6, coaxial fiber-optic cable	25	LL 3-DB 01-1	5 308 075	40	0.015	40	0.015	30	0.015
For tip adapters, M 3	15	LL 3-DT 01	5 308 076	25	0.02	25/12[2]	0.015	18	0.015
Thin, short sleeve, M 4, coaxial fiber-optic cable	25	LL 3-DM 02	5 308 077	25	0.02	25	0.015	18	0.015
Highly flexible, M 6, large scanning distance	4	LL 3-DR 01	5 308 078	70	0.02	70	0.015	50	0.015
Highly flexible, small sleeve, M 3	4	LL 3-DR 02	5 308 079	9	0.02	9	0.015	6	0.015
Highly flexible, ø 3 mm, thin sleeve	4	LL 3-DR 03	5 308 080	20	0.02	20	0.015	14	0.015
Highly flexible, ø 1.5 mm, thin sleeve	4	LL 3-DR 04[4]	5 308 081	9	0.02	9	0.015	6	0.015
Highly flexible, M 4, compact sleeve	4	LL 3-DR 06	5 308 082	20	0.02	20	0.015	14	0.015
Flexible sleeve, M 6, large scanning distance	25/10[3]	LL 3-DB 02	5 308 083	70	0.02	70	0.015	50	0.015
Flexible sleeve, M 4	25/10[3]	LL 3-DM 03	5 308 084	20	0.02	20	0.015	14	0.015
Thin, long terminal tip, M 3	15	LL 3-DT 02	5 308 085	5	0.02	5	0.015	3	0.015
Thin, long terminal tip, M 3, coaxial fiber-optic cable	15	LL 3-DT 04[4]	5 308 086	9	0.02	9	0.015	5	0.015
ø 3.0 mm, thin terminal tip, ø 0.82 mm	4	LL 3-DR 05[4]	5 308 087	5	0.02	5	0.015	3	0.015
90° offset, ø 5.0 mm	25	LL 3-DV 01	5 308 088	40	0.03	40	0.025	30	0.025
90° offset, small sleeve, ø 3.0 mm	15	LL 3-DV 02	5 308 089	9	0.02	8	0.015	5	0.015
90° offset, M 6	25	LL 3-DV 03	5 308 090	40	0.03	40	0.025	30	0.025
Temp. resist. to 180 °C, M 6, large scanning distance	30	LL 3-DH 01[5]	5 308 091	100	0.02	100	0.015	70	0.015
Temperature resistant to 100 °C, M 6	25	LL 3-DH 02[6]	5 308 092	55	0.02	55	0.015	50	0.015
Teflon coating, chemically resistant, ø 6.0 mm	40	LL 3-DY 01	5 308 093	●		45	0.02	●	
Level switch, clear liquid, ø 6.0 mm	50	LL 3-DF 01	5 308 094	●		yes		●	
Level switch, cloudy liquid, ø 6.0 mm	50	LL 3-DF 02	5 308 095	●		yes		●	

1) With reference to white scanned object, 90 % reflectance, minimum object diameter = light size (opening angle LL: approx. 65°) fiber-optic cable not shortened
2) With scanner tip adapter für LL 3, see tip adapters for LL 3
3) Bending radius of the flexible terminal sleeve
4) Cannot be shortened
5) Ambient operating temperature –40 ... +180 °C
6) Ambient operating temperature –40 ... +100 °C
7) Minimum object diameter: scanning distance reduction!

Fiber-optic cable through-beam system

Characteristics

- Highly flexible
- Small bending radii
- Fiber-optic cables can be shortened easily with cuting device (supplied with equipment)
- Ambient temperature –40...+70 °C
  Special models to 180 °C

Selection table: sensors, fiber-optic cables, scanning ranges

Through-beam systems

Scanning ranges SR[1] and minimum object diameter MO[6] in mm in connection with sensor type

LL 3 Fiber-optic cables				WLL 160 Red light		WLL 160 T Red light (NORM/MAX)		WLL 160 T Red light (FAST)	
Description	Bending radius mm	Type	Order no.	SR	MO	SR	MO	SR	MO
Standard, M 4	25	LL 3-TB 02	5 308 048	200/2000[2]	0.2/4.0	200/2000[2]	0.2/4.0	150/1500[2]	0.2/4.0
Standard, ø 3 mm, large scanning range	35	LL 3-TS 07	5 308 049	500	0.5	500	0.5	360	0.5
Standard, M 4, large scanning range	25	LL 3-TB 01	5 308 050	400/1500[2]	0.5/4.0	400/1500[2]	0.2/4.0	280/1500[2]	0.2/4.0
Standard, M 4, length 10 m	25	LL 3-TB 01-10	5 308 051	250/900[2]	0.5/4.0	250/900[2]	0.5/4.0	190/660[2]	0.5/4.0
Highly flexible, M 4, large scanning range	4	LL 3-TR 01	5 308 052	180/1200[2]	0.2/4.0	180/1200[2]	0.2/4.0	130/850[2]	0.2/4.0
Highly flexible, M 3	4	LL 3-TR 02	5 308 053	50	0.2	50	0.1	40	0.2
Small sleeve, ø 1,5 mm, highly flexible, length 1 m	4	LL 3-TR 03	5 308 054	50	0.2	50	0.1	40	0.2
Small sleeve, ø 1,5 mm, highly flexible, length 2 m	4	LL 3-TR 03-2	5 308 055	50	0.2	50	0.1	40	0.2
Flexible terminal sleeve, M 4	25/10[3]	LL 3-TB 03	5 308 056	200	0.2	200	0.2	150	0.2
Compact, M 3, terminal piece 1,0 m	15	LL 3-TT 01	5 308 057	18	0.1	18	0.1	10	0.2
90° offset, standard, ø 3 mm	25	LL 3-TV 01	5 308 058	150	0.2	150	0.2	130	0.2
90° offset, compact, ø 2.5 mm	15	LL 3-TV 02	5 308 059	40	0.2	40	0.2	30	0.2
90° offset, compact, M 3	15	LL 3-TV 04	5 308 060	40	0.2	40	0.2	30	0.2
90° offset, standard, ø 3 mm	25	LL 3-TS 08	5 308 061	200	0.2	200	0.2	150	0.2
90° offset, large scanning range	25	LL 3-TS 12	5 308 062	700	0.5	700	0.5	400	0.5
Fiber-optic line	25	LL 3-TS 10	5 308 063	260	1.0	260	1.0	190	1.0
Temperature resistant, M 4	25	LL 3-TH 01[4]	5 308 064	180/1500[2]	0.2/4.0	180/1500[2]	0.2/4.0	130/1050[2]	0.2/4.0
Temperature resistant to 180 °C, M 4	30	LL 3-TH 02[5]	5 308 065	350	0.5	350	0.5	240	0.5
Teflon coating, ø 6.0 mm, chemically resistant	40	LL 3-TY 01	5 308 066	1000	0.8	1000	0.5	700	0.5
Teflon coating, ø 6.0 mm, chemically resistant	40	LL 3-TY 02	5 308 067	250	0.5	250	0.3	180	0.3
90° offset									
Small terminal sleeve, M 3, large scanning range	25	LL 3-TM 01	5 308 068	200	0.2	200	0.2	150	0.2
Small terminal sleeve, M 3	15	LL 3-TM 02	5 308 069	70	0.2	70	0.1	50	0.1
Small terminal sleeve, ø 1.5 mm	15	LL 3-TM 03	5 308 070	70	0.2	70	0.1	50	0.1

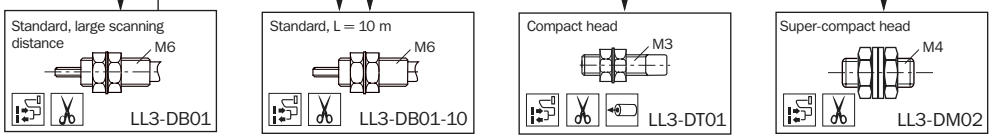
1) Fiber-optic cable not shortened
2) With tip adapters for LL 3, also see tip adapters for LL 3
3) Bending radius of the flexible terminal sleeve
4) Ambient operating temperature –40 ... +100 °C
5) Ambient operating temperature –40 ... +180 °C
6) Minimum object diameter: scanning range reduction!

Flow diagrams of fiber-optic cable selection

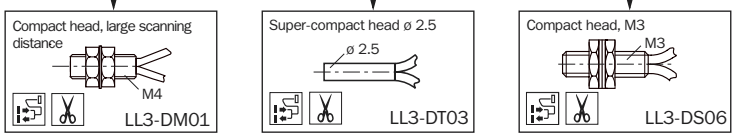
Scanner systems

Coaxial design for exact switching

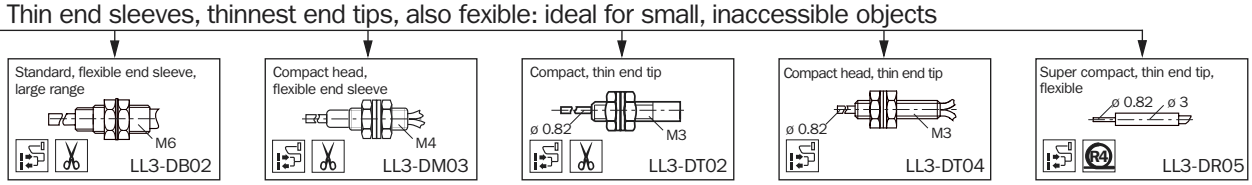
Fiber length 10 m



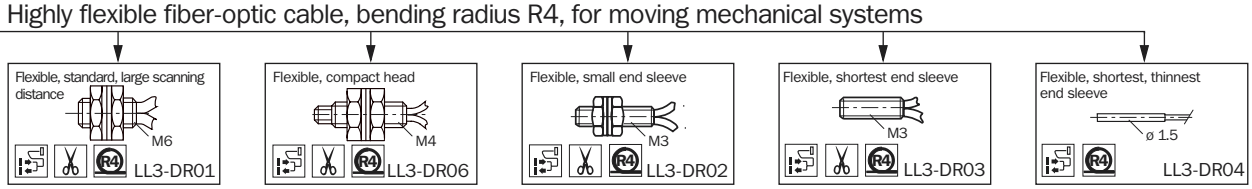
Compact end sleeve, attractive scanning



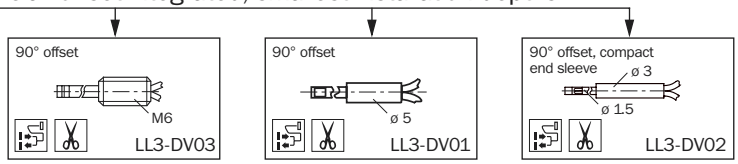
Thin end sleeves, thinnest end tips, also fexible: ideal for small, inaccessible objects



Highly flexible fiber-optic cable, bending radius R4, for moving mechanical systems



90° offset integrated, smallest installation depths

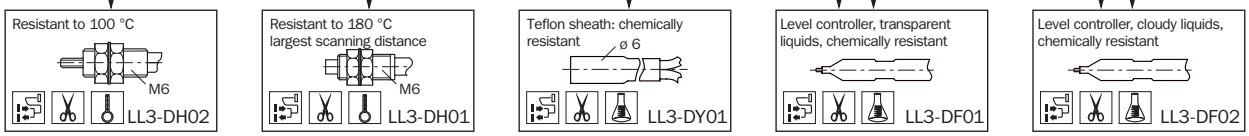


Special applications:

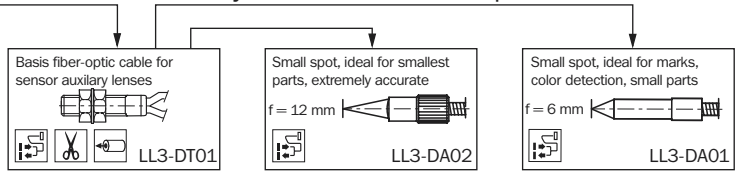
Level controller

Chemicals

Temperature



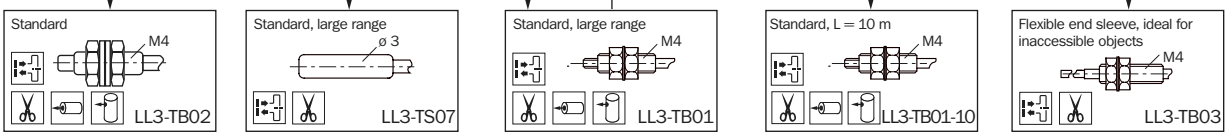
Accessories: Auxiliary lenses with focused optics



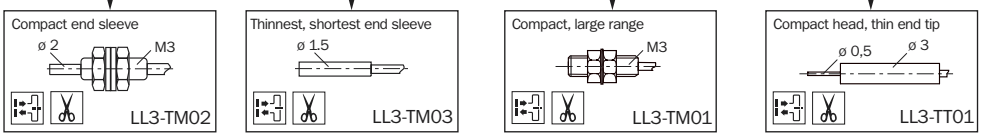
Flow diagrams of fiber-optic cable selection

Through-beam systems

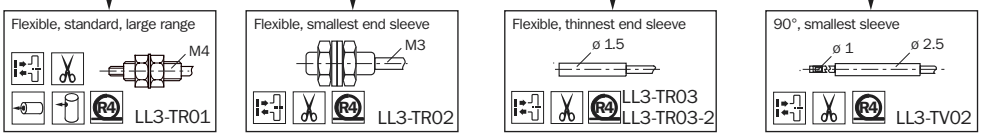
Standard



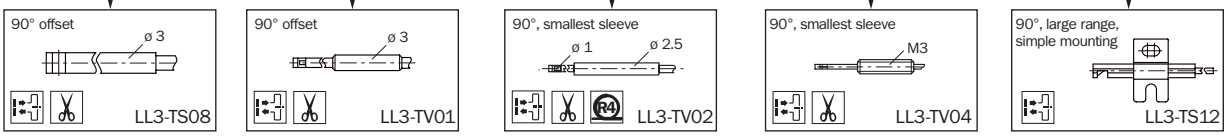
Thin, short end sleeve



Highly flexible fiber-optic cable, small bending radius R4, for moving mechanical systems



Integrated 90° offset, smallest installation depth

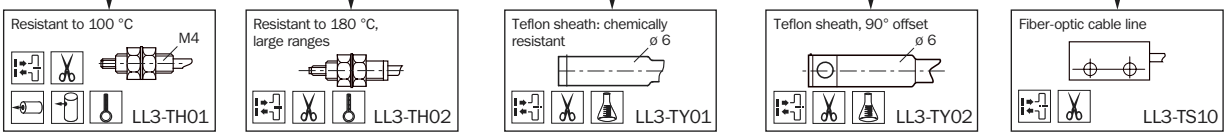


Special applications:

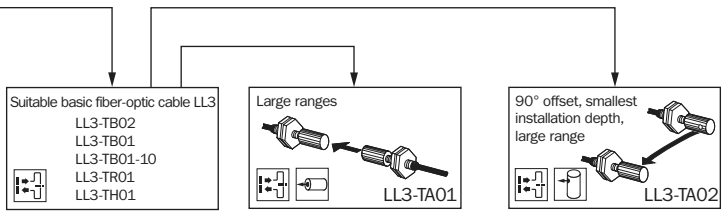
Fiber-optic cable line

Chemicals

Temperature



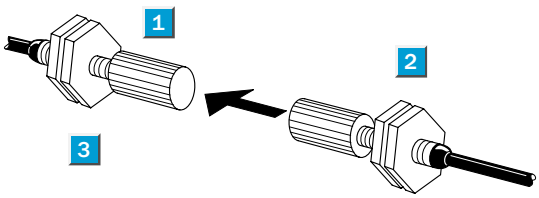
Accessories: Auxiliary lenses, large ranges (max. 3200 mm), 90° offset



Tip adapters for through-beam systems

Large scanning ranges

1 Light spot ø: approx. 170 mm at 1000 mm
2 Opening angle: approx. 15°
3 Material: CuZn (nickel-plated)/glass

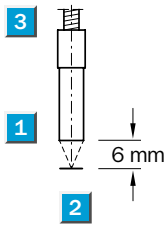


Ordering information	
Type	**Order no.**
LL 3-TA01	5 308 128

Tip adapters for scanner systems

For detecting the smallest parts
Focussed, very small light spot ø
High sensitivity (6 % reflectance)
For suppressing background interference

1 Light spot ø: approx. 0.25 mm in focus = 6 mm
2 Opening angle: focus = 6 mm
3 Material: Al (aluminum)/glass

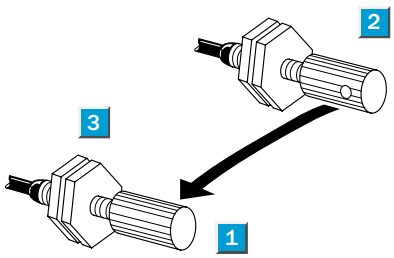


Ordering information	
Type	**Order no.**
LL 3-DA01	5 308 127

Tip adapters for through-beam systems

Compact 90° offset

1 Light spot ø: X axis: approx. 110 mm,
Y axis: approx. 170 mm, each time when SR = 200 mm
2 Opening angle: X axis: approx. 30°, Y axis: approx. 40°
3 Material: CuZn (nickel-plated)/glass

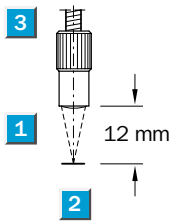


Ordering information	
Type	**Order no.**
LL 3-TA02	5 308 129

Tip adapters for scanner systems

Suitable as “mark” sensor for color marks
Focussed, very small light spot ø
High sensitivity (6 % reflectance)
For suppressing background interference

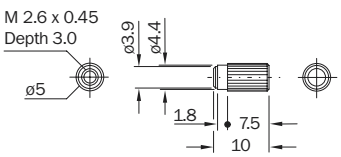
1 Light spot ø: approx. 3 mm in focus = 12 mm
2 Opening angle: focus = 12 mm
3 Material: Al (aluminum)/glass



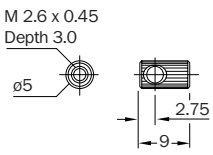
Ordering information	
Type	**Order no.**
LL 3-DA02	5 308 130

Dimensional drawings for tip adapters for LL 3 fiber-optic cables

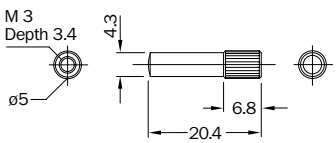
Ordering information	
Type	**Order no.**
LL 3-TA01	5 308 128



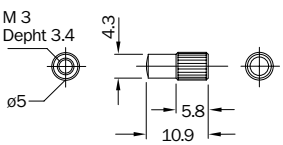
Ordering information	
Type	**Order no.**
LL 3-TA02	5 308 129



Ordering information	
Type	**Order no.**
LL 3-DA01	5 308 127



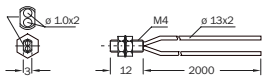
Ordering information	
Type	**Order no.**
LL 3-DA02	5 308 130



Dimensional drawings for LL 3 fiber-optic cables – scanner systems

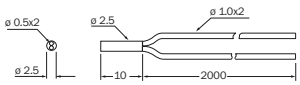
Ordering information	
Type	**Order no.**
LL 3-DM01	5 308 071

Material: core: PMMA; coating: PE;
Sleeve: 1.4305 (German material no.)
Corrosion-resistant stainless steel



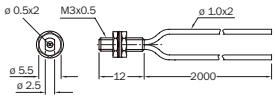
Ordering information	
Type	**Order no.**
LL 3-DT03	5 308 072

Material: core: PMMA; coating: PE;
Sleeve: 1.4305 (German material no.)
Corrosion-resistant stainless steel



Ordering information	
Type	**Order no.**
LL 3-DS06	5 308 073

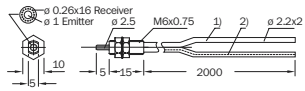
Material: core: PMMA; coating: PE;
Sleeve: 1.4305 (German material no.)
Corrosion-resistant stainless steel



Ordering information	
Type	**Order no.**
LL 3-DB01	5 308 074

Material: core: PMMA; coating: PE;
Sleeve: 1.4305 (German material no.)
Corrosion-resistant stainless steel

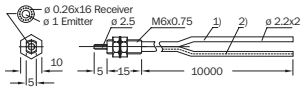
1) Transmitter
2) Receiver



Ordering information	
Type	**Order no.**
LL 3-DB01-10	5 308 075

Material: core: PMMA; coating: PE;
Sleeve: 1.4305 (German material no.)
Corrosion-resistant stainless steel

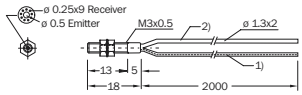
1) Transmitter
2) Receiver



Ordering information	
Type	**Order no.**
LL 3-DT01	5 308 076

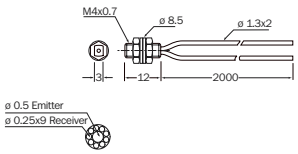
Material: core: PMMA; coating: PE;
Sleeve: 1.4305 (German material no.)
Corrosion-resistant stainless steel

1) Transmitter
2) Receiver



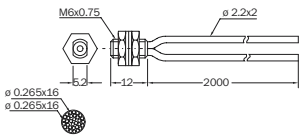
Ordering information	
Type	**Order no.**
LL 3-DM02	5 308 077

Material: core: PMMA; coating: PE;
Sleeve: 1.4305 (German material no.)
Corrosion-resistant stainless steel



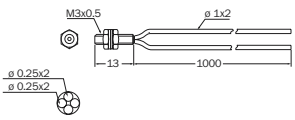
Ordering information	
Type	**Order no.**
LL 3-DR01	5 308 078

Material: core: PMMA; coating: PE;
Sleeve: 1.4305 (German material no.)
Corrosion-resistant stainless steel



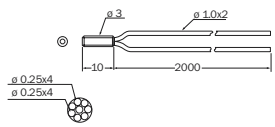
Ordering information	
Type	**Order no.**
LL 3-DR02	5 308 079

Material: core: PMMA; coating: PE;
Sleeve: 1.4305 (German material no.)
Corrosion-resistant stainless steel



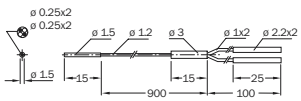
Ordering information	
Type	**Order no.**
LL 3-DR03	5 308 080

Material: core: PMMA; coating: PE;
Sleeve: 1.4305 (German material no.)
Corrosion-resistant stainless steel



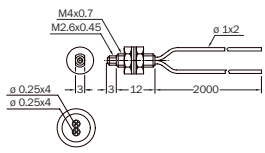
Ordering information	
Type	**Order no.**
LL 3-DR04	5 308 081

Material: core: PMMA; coating: PE;
Sleeve: 1.4305 (German material no.)
Corrosion-resistant stainless steel



Ordering information	
Type	**Order no.**
LL 3-DR06	5 308 082

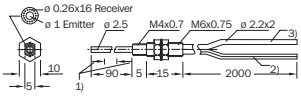
Material: core: PMMA; coating: PE;
Sleeve: 1.4305 (German material no.)
Corrosion-resistant stainless steel



Dimensional drawings for LL 3 fiber optic cables – scanner systems

Ordering information	
Type	**Order no.**
LL 3-DB02	5 308 083

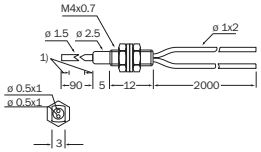
Material: core: PMMA; coating: PE; Sleeve: 1.4305 (German material no.) Corrosion-resistant stainless steel



1) Flexible terminal sleeve, do not bend in this area (10 mm), bending radius R 10
2) Transmitter (marked blue)
3) Receiver

Ordering information	
Type	**Order no.**
LL 3-DM03	5 308 084

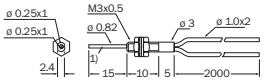
Material: core: PMMA; coating: PE; Sleeve: 1.4305 (German material no.) Corrosion-resistant stainless steel



1) Flexible terminal sleeve, do not bend in this area (10 mm), bending radius R 10

Ordering information	
Type	**Order no.**
LL 3-DT02	5 308 085

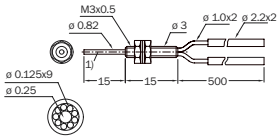
Material: core: PMMA; coating: PE; Sleeve: 1.4305 (German material no.) Corrosion-resistant stainless steel



1) Terminal sleeve inflexible

Ordering information	
Type	**Order no.**
LL 3-DT04	5 308 086

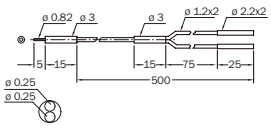
Material: core: PMMA; coating: PE; Sleeve: CuZn brass nickel-plated



1) Terminal sleeve inflexible

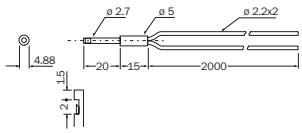
Ordering information	
Type	**Order no.**
LL 3-DR05	5 308 087

Material: core: PMMA; coating: PE; Sleeve: CuZn brass nickel-plated



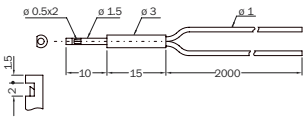
Ordering information	
Type	**Order no.**
LL 3-DV01	5 308 088

Material: core: PMMA; coating: PE; Sleeve: 1.4305 (German material no.) Corrosion-resistant stainless steel



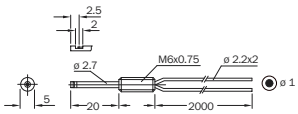
Ordering information	
Type	**Order no.**
LL 3-DV02	5 308 089

Material: core: PMMA; coating: PE; Sleeve: 1.4305 (German material no.) Corrosion-resistant stainless steel



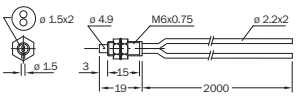
Ordering information	
Type	**Order no.**
LL 3-DV03	5 308 090

Material: core: PMMA; coating: PE; Sleeve: 1.4305 (German material no.) Corrosion-resistant stainless steel



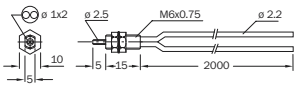
Ordering information	
Type	**Order no.**
LL 3-DH01	5 308 091

Material: core: PMMA; coating: PE; Sleeve: 1.4305 (German material no.) Corrosion-resistant stainless steel



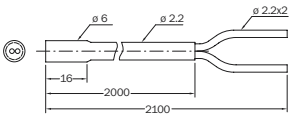
Ordering information	
Type	**Order no.**
LL 3-DH02	5 308 092

Material: core: PMMA; coating: PE; Sleeve: 1.4305 (German material no.) Corrosion-resistant stainless steel



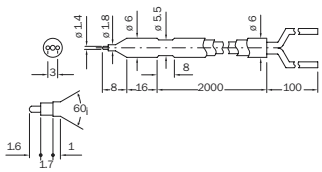
Ordering information	
Type	**Order no.**
LL 3-DY01	5 308 093

Material: core: PMMA; coating: Teflon; Sleeve: Teflon



Ordering information	
Type	**Order no.**
LL 3-DF01	5 308 094 1)
LL 3-DF02	5 308 095 2)

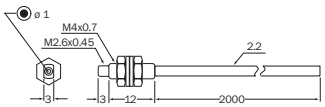
1) For transparent liquids
2) For cloudy liquids



Dimensional drawings for LL 3 fiber-optic cables – through-beam systems

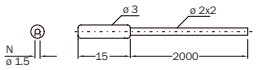
Ordering information	
Type	**Order no.**
LL 3-TB02	5 308 048

Material: core: PMMA; coating: PE;
Sleeve: 1.4305 (German material no.)
Corrosion-resistant stainless steel



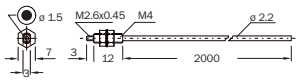
Ordering information	
Type	**Order no.**
LL 3-TS07	5 308 049

Material: core: PMMA; coating: PE;
Sleeve: 1.4305 (German material no.)
Corrosion-resistant stainless steel



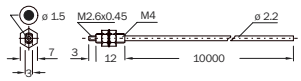
Ordering information	
Type	**Order no.**
LL 3-TB01	5 308 050

Material: core: PMMA; coating: PE;
Sleeve: 1.4305 (German material no.)
Corrosion-resistant stainless steel



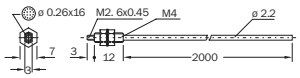
Ordering information	
Type	**Order no.**
LL 3-TB01-10	5 308 051

Material: core: PMMA; coating: PE;
Sleeve: 1.4305 (German material no.)
Corrosion-resistant stainless steel



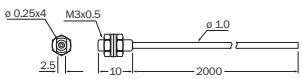
Ordering information	
Type	**Order no.**
LL 3-TR01	5 308 052

Material: core: PMMA; coating: PE;
Sleeve: CuZn brass nickel-plated



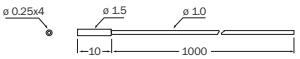
Ordering information	
Type	**Order no.**
LL 3-TR02	5 308 053

Material: core: PMMA; coating: PE;
Sleeve: 1.4305 (German material no.)
Corrosion-resistant stainless steel



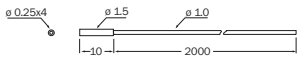
Ordering information	
Type	**Order no.**
LL 3-TR03	5 308 054

Material: core: PMMA; coating: PE;
Sleeve: 1.4305 (German material no.)
Corrosion-resistant stainless steel



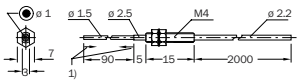
Ordering information	
Type	**Order no.**
LL 3-TR03-2	5 308 055

Material: core: PMMA; coating: PE;
Sleeve: 1.4305 (German material no.)
Corrosion-resistant stainless steel



Ordering information	
Type	**Order no.**
LL 3-TB03	5 308 056

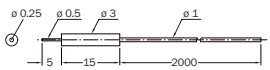
Material: core: PMMA; coating: PE;
Sleeve: 1.4305 (German material no.)
Corrosion-resistant stainless steel



1) Flexible terminal sleeve, do not bend in this area (10 mm), bending radius R 10

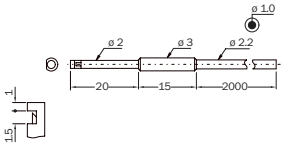
Ordering information	
Type	**Order no.**
LL 3-TT01	5 308 057

Material: core: PMMA; coating: PE;
Sleeve: 1.4305 (German material no.)
Corrosion-resistant stainless steel



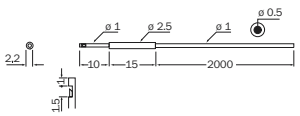
Ordering information	
Type	**Order no.**
LL 3-TV01	5 308 058

Material: core: PMMA; coating: PE;
Sleeve: 1.4305 (German material no.)
Corrosion-resistant stainless steel



Ordering information	
Type	**Order no.**
LL 3-TV02	5 308 059

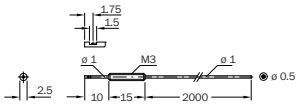
Material: core: PMMA; coating: PE;
Sleeve: 1.4305 (German material no.)
Corrosion-resistant stainless steel



Dimensional drawings for LL 3 fiber-optic cables – through-beam systems

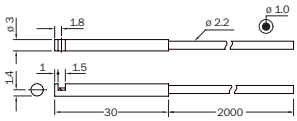
Ordering information	
Type	**Order no.**
LL 3-TV04	5 308 060

Material: core: PMMA; coating: PE; Sleeve: 1.4305 (German material no.) Corrosion-resistant stainless steel



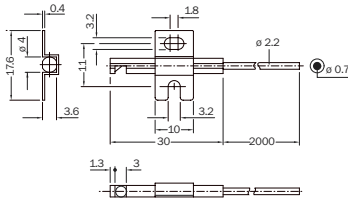
Ordering information	
Type	**Order no.**
LL 3-TS08	5 308 061

Material: core: PMMA; coating: PE; Sleeve: 1.4305 (German material no.) Corrosion-resistant stainless steel



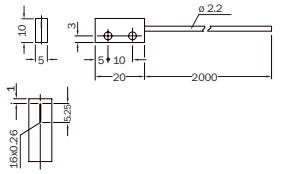
Ordering information	
Type	**Order no.**
LL 3-TS12	5 308 062

Material: core: PMMA; coating: PE; Sleeve: 1.4305 (German material no.) Corrosion-resistant stainless steel



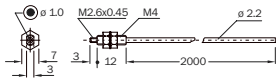
Ordering information	
Type	**Order no.**
LL 3-TS10	5 308 063

Material: core: PMMA; coating: PE; Sleeve: CuZn brass nickel-plated



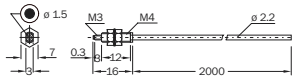
Ordering information	
Type	**Order no.**
LL 3-TH01	5 308 064

Material: core: PMMA; coating: PE; Sleeve: CuZn brass nickel-plated



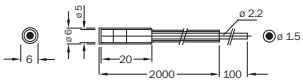
Ordering information	
Type	**Order no.**
LL 3-TH02	5 308 065

Material: core: HPOF; coating: FEP; Sleeve: 1.4305 (German material no.) Corrosion-resistant stainless steel



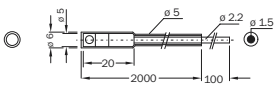
Ordering information	
Type	**Order no.**
LL 3-TY01	5 308 066

Material: core: PMMA; coating: Teflon; Sleeve: Teflon



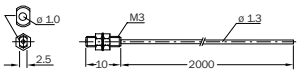
Ordering information	
Type	**Order no.**
LL 3-TY02	5 308 067

Material: core: PMMA; coating: Teflon; Sleeve: Teflon



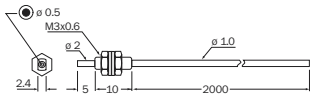
Ordering information	
Type	**Order no.**
LL 3-TM01	5 308 068

Material: core: PMMA; coating: PE; Sleeve: 1.4305 (German material no.) Corrosion-resistant stainless steel



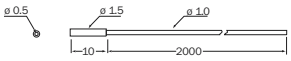
Ordering information	
Type	**Order no.**
LL 3-TM02	5 308 069

Material: core: PMMA; coating: PE; Sleeve: 1.4305 (German material no.) Corrosion-resistant stainless steel



Ordering information	
Type	**Order no.**
LL 3-TM03	5 308 070

Material: core: PMMA; coating: PE; Sleeve: 1.4305 (German material no.) Corrosion-resistant stainless steel



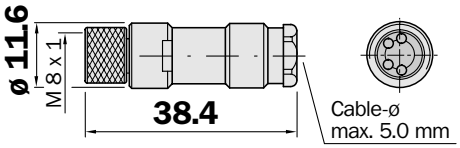
Dimensional drawings and ordering information

Pin assignment according to EN 50044

SENSICK circular screwing system M 8, 4 pin, enclosure rating IP 67

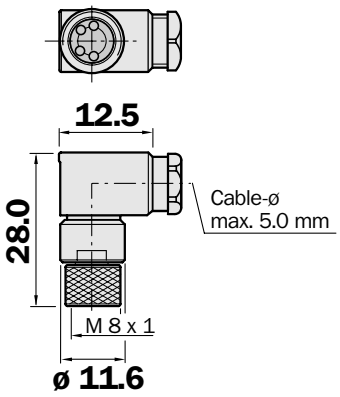
M 8 cable receptacle, 4 pin, straight

Type	Order no.
DOS-0804-G	6 009 974



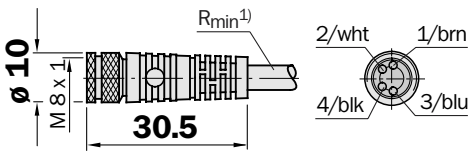
M 8 cable receptacle, 4 pin, angled

Type	Order no.
DOS-0804-W	6 009 975



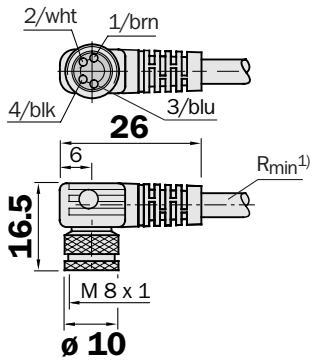
M 8 cable receptacle, 4 pin, straight
Cable ø 5 mm, 4 x 0.25 mm², PVC coating

Type	Order no.	Cable length
DOL-0804-G02M	6 009 870	2 m
DOL-0804-G05M	6 009 872	5 m
DOL-0804-G10M	6 010 754	10 m



M 8 cable receptacle, 4 pin, angled
Cable ø 5 mm, 4 x 0.25 mm², PVC coating

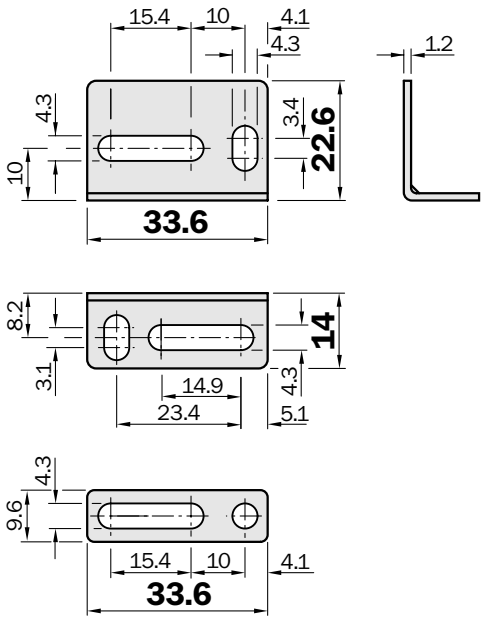
Type	Order no.	Cable length
DOL-0804-W02M	6 009 871	2 m
DOL-0804-W05M	6 009 873	5 m
DOL-0804-W10M	6 010 755	10 m



1) Minimum bending radius with dynamic use
R_{min} = 20 x cable diameter

Mounting bracket for W 160

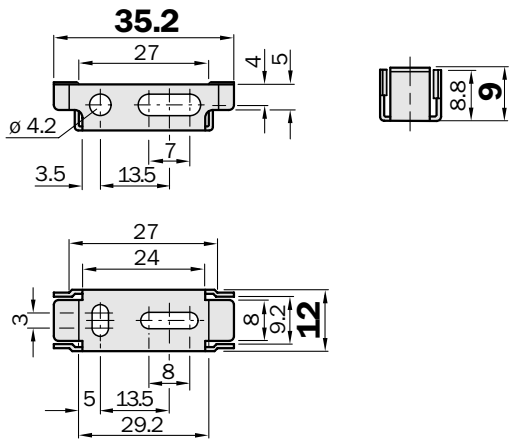
Type	Order no.
BEF-W 160	5 305 197



Supplied with WS/WE 160, WL 160 and WT 160.

Mounting bracket for WLL 160

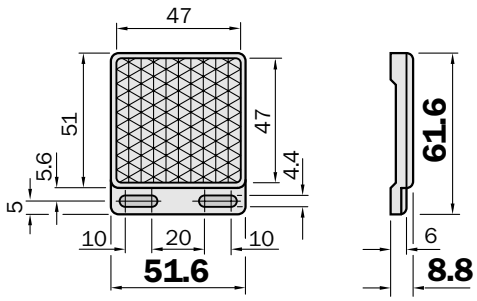
Type	Order no.
BEF-WLL 160	5 305 400



Supplied with WLL 160 and WLL 160T.

Reflector

Type	Order no.
P 250	5 304 812

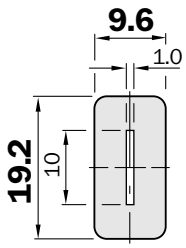


Supplied with WL 160.

Slotted masks for WS/WE 160

Slot width: 1.0 mm*/0.5 mm, 1.0 mm, 2.0 mm

Type	Order no.
BL-160-10*	5 305 196
BL-160-SK	5 310 718



2 pieces supplied with equipment.

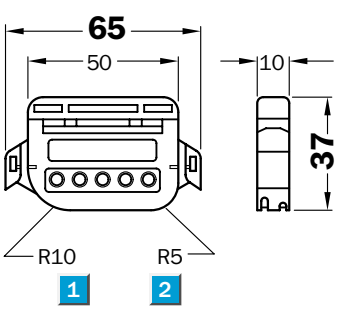
Cutting device for fiber-optic cables

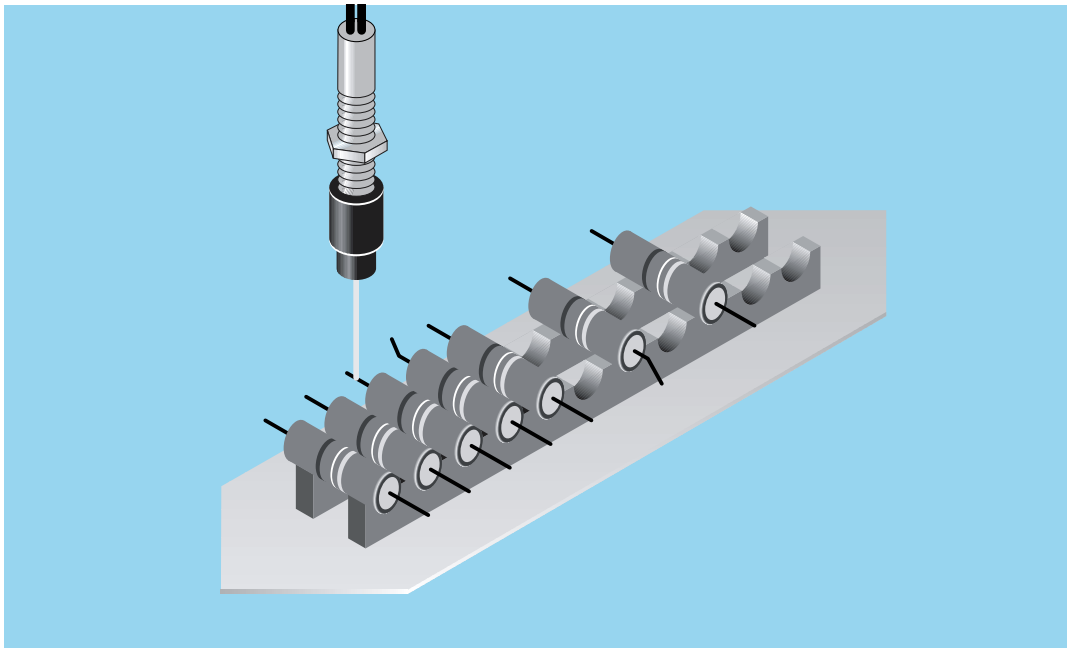
Ordering information

Type	Order no.
FC	5 304 141

The cutting device is supplied with the LL 3. Follow the operating instructions in the packaging.

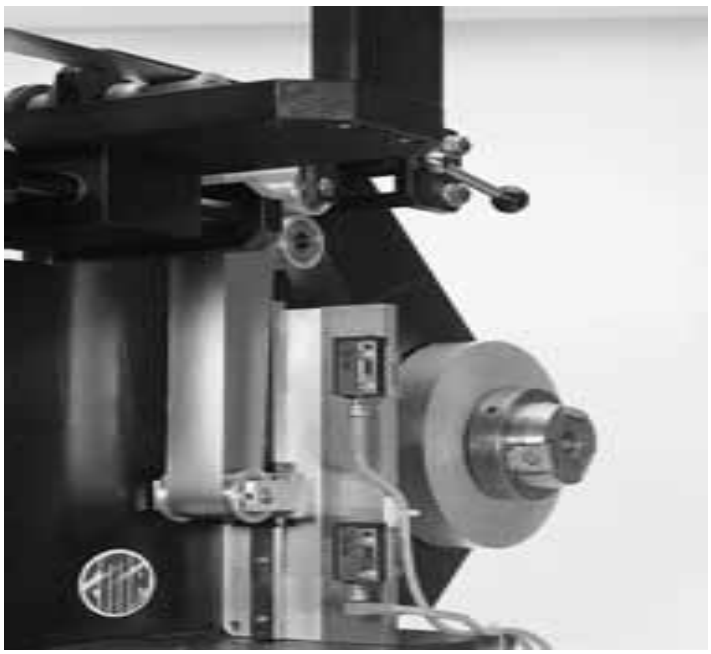
1 Template for bending radius R 10 mm, for terminal sleeve ø 1.5 mm and ø 2.5 mm
2 Bending radius R 5 mm



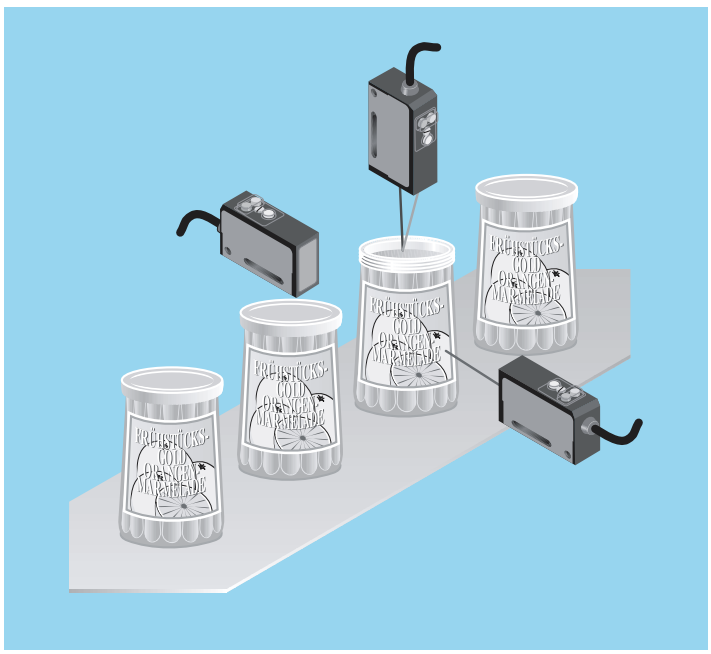


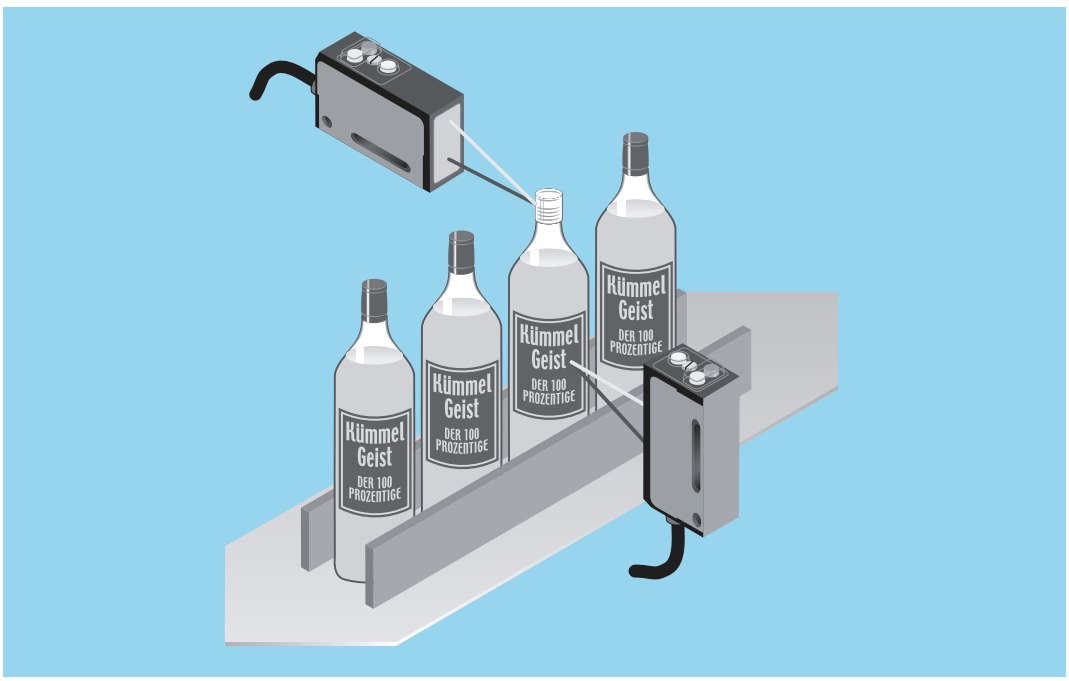
◄ WLL 160 in the fiber-optic cable model detects the thinnest wires without problems in the production of resistances.

▼ Presence check of closures: Lid detection with WT 160 photoelectric proximity switch and clock-pulse with WS/WE 160 through-beam photoelectric switches.



▲ The WT 160 miniature photoelectric proximity switch is used in film processing and for controlling belt tension.





► Closure and lable check with WT 160 photoelectric proximity switch.