



**Model Number**

**SU19.1/110/115**

Fiber optic sensor  
with 2 m fixed cable

**Features**

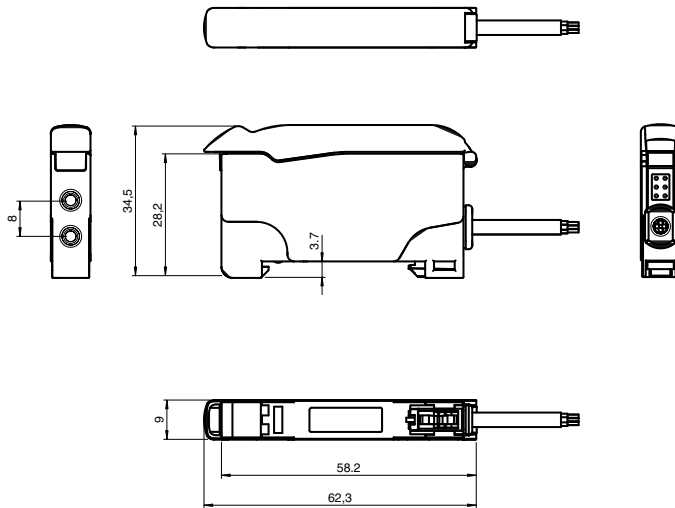
- Classic line with display
- AGC (Automatic Gain Control) for faster teach-in
- Gang mounting for easy wiring
- Transparency recognition
- 30 µs High Speed Mode
- Slave module

**Product information**

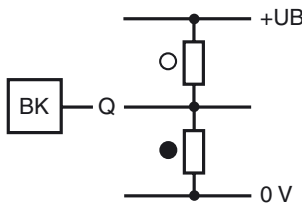
The fiber optics amplifier SU19 with display was developed to set a benchmark with the most comfortable and user-friendly interface. This simplicity of the settings decreases the costs of ownership significantly. The whole Teach-In process of objects is time-saving due to an easy Teach-In algorithm. The high resolution 4-digit percentage display indicates current values and thresholds with highest accuracy. Wire-saving and the replacement of devices is designed user-friendly and time-saving due to gang mounting on the rear.

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**Dimensions**

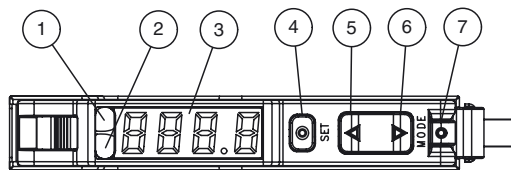


**Electrical connection**



- = Light on
- = Dark on

**Indicators/operating means**



1	Operating display	green
2	Signal display	yellow
3	Display	
4	Button: Set	
5	Button: Up	
6	Button: Down	
7	Button: Mode	

**Technical data****General specifications**

Sensor range	up to 150 mm (KLR-C02-2,2-2,0-K146)
Detection range	up to 450 mm (KLE-C01-2,2-2,0-K116)
Light source	LED
Light type	modulated visible red light , 660 nm
Ambient light limit	10000 Lux
Gang mounting	maximum 20 units / 100 mA load current per unity

**Functional safety related parameters**

MTTF <sub>d</sub>	500 a
Mission Time (T <sub>M</sub> )	20 a
Diagnostic Coverage (DC)	0 %

**Indicators/operating means**

Operating display	Power on: static illumination , Undervoltage indicator: Green LED, pulsing (approx. 0.8 Hz) , short-circuit : LED green flashing (approx. 4 Hz)
Diagnostics display	7-segment display
Function display	LED yellow: static illumination switching state, flashes when falling short of the stability control
Controls	Button (Mode) for menu choice ; Button (Set) for Teach-In ; Button (Up/Down) for fine adjusting and parameterization

**Electrical specifications**

Operating voltage	U <sub>B</sub>	10 ... 30 V DC
Ripple		10 %
No-load supply current	I <sub>0</sub>	≤ 30 mA

**Output**

Switching type	light/dark on selectable programmable	
Signal output	1 push-pull output NPN/PNP , short-circuit protected	
Switching voltage	max. 30 V DC	
Switching current	max. 100 mA , resistive load	
Voltage drop	U <sub>d</sub>	≤ 2 V DC at 100 mA ; ≤ 0.7 V at 10 mA
Switching frequency	f	High speed mode: 16 kHz , Standard mode: 3 kHz , High resolution: 250 Hz ~ 3 kHz (selection by the sensor), Automatic: 250 Hz , Glass mode: 250 Hz
Response time		High speed mode: 30 μs , Standard mode: 160 μs , High resolution: 2 ms , Automatic: 160 μs ~ 2 ms (choice by the sensor), Glass mode: 2 ms
Repeat accuracy	R	≤ 0.5 % of adjusted sensor range
Timer function		ON-delay, OFF-delay, one shot, pulse extension ; adjustable 0 ... 999 ms in 1 ms increments

**Ambient conditions**

Ambient temperature	-10 ... 55 °C (14 ... 131 °F)
Storage temperature	-20 ... 70 °C (-4 ... 158 °F)

**Mechanical specifications**

Protection degree	IP50
Connection	2 m fixed cable , 1 x 0.25 mm <sup>2</sup> , PVC
Material	
Housing	PC
Mass	45 g

**Compliance with standards and directives**

Standard conformity	
Product standard	EN 60947-5-2:2007 IEC 60947-5-2:2007

**Approvals and certificates**

UL approval	cULus Listed, Class 2 Power Source, Type 1 enclosure
CCC approval	Products with a maximum operating voltage of ≤36 V do not bear a CCC marking because they do not require approval.

**Accessories**

**KLR-C02-2,2-2,0-K146**  
Plastic fiber optic - diffuse

**KLR-C02-2,2-2,0-K70**  
Plastic fiber optic - diffuse

**KLR-C02-1,0-2,0-K75**  
Plastic fiber optic - diffuse

**KLR-C09-1,25-2,0-K76**  
Plastic fiber optic - diffuse

**KLR-C09-1,25-2,0-K74**  
Plastic fiber optic - diffuse

**KLR-C16-2,2-2,0-K71**  
Plastic fiber optic - diffuse

**KLR-A32-2,2-2,0-K83**  
Plastic fiber optic - diffuse

**KHR-C02-2,2-2,0-K131**  
Plastic fiber optic - diffuse

**KHTR-C02-2,2-2,0-K88**  
Plastic fiber optic - diffuse

**LHR 00-0,8-1,0-20M4**  
Glass fiber optic - diffuse with silicon covering

**KLE-C01-2,2-2,0-K116**  
Plastic fiber optic - thru-beam

**KLE-C01-2,2-2,0-K103**  
Plastic fiber optic - thru-beam

**KLE-C01-2,2-2,0-K102**  
Plastic fiber optic - thru-beam

**KLE-C01-2,2-2,0-K100**  
Plastic fiber optic - thru-beam

**KLE-C01-2,2-2,0-K101**  
Plastic fiber optic - thru-beam

**KLE-C01-2,2-2,0-K113**  
Plastic fiber optic - thru-beam

**KLE-C01-1,0-2,0-K120**  
Plastic fiber optic - thru-beam

**KHE-C01-2,2-2,0-K122**  
Plastic fiber optic - thru-beam

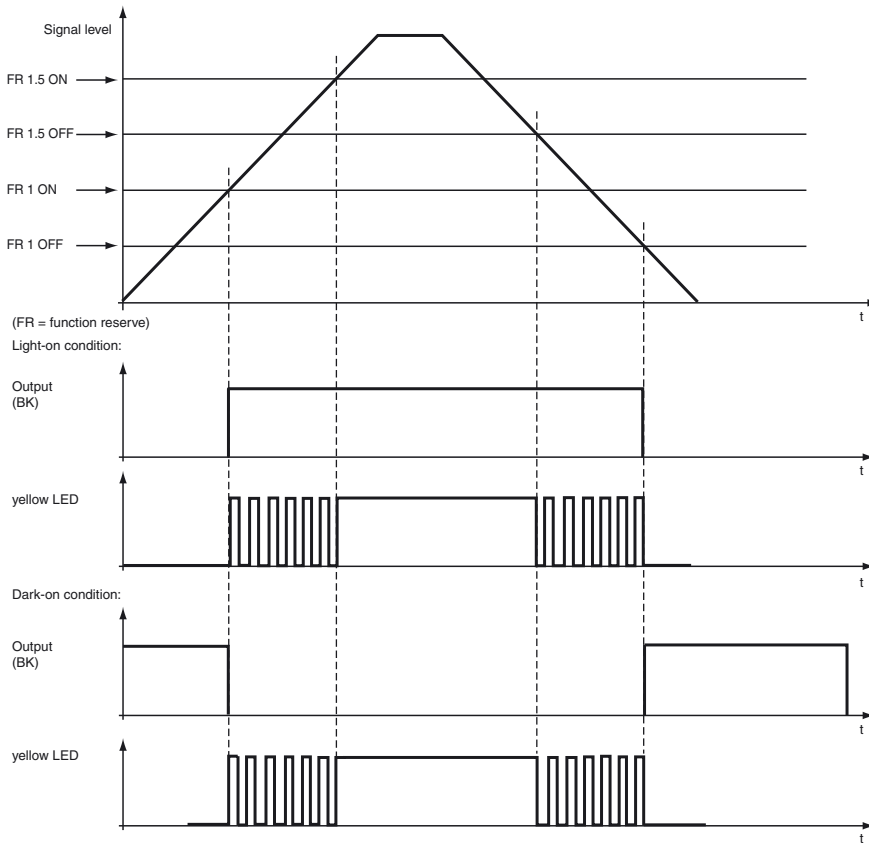
**KHTE-C01-2,2-2,0-K118**  
Plastic fiber optic - thru-beam

**LHE 00-1,1-1,0-20M4**  
Glass fiber optic - thru-beam with silicon covering

**Bracket SU**  
Mounting bracket for DIN rail

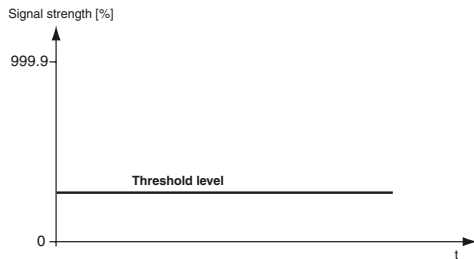
Other suitable accessories can be found at [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com)

**LED indicators and operating chart:**



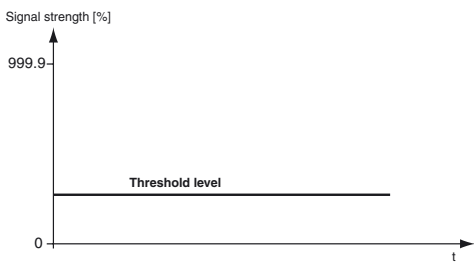
**Teach-In methods**

**Maximum Teach-In**



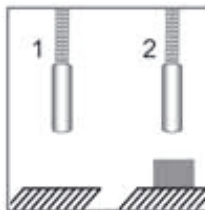
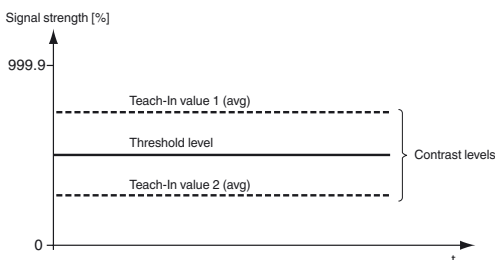
- Gain is set to maximum.
- Threshold is set to minimum.
- Maximum sensitivity is achieved.

**Position Teach-In**



- Sensor set the optimum gain.
- Threshold is set to minimum.
- Signal received is ~ 100%.

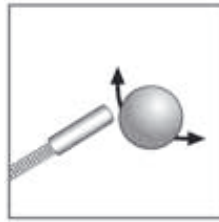
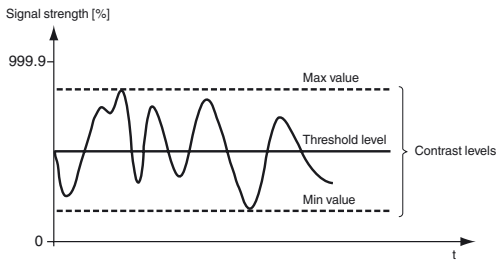
**2-Point Teach-In**



- Sensor set the optimum gain.
- Threshold is set in the middle of the 2 average taught values.

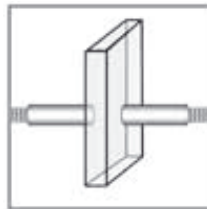
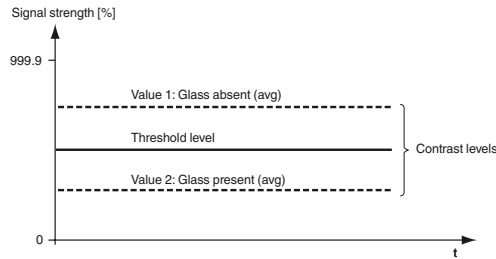
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**Dynamic Teach-In**



- Sensor set the optimum gain.
- Threshold is placed in the middle of the minimum and maximum taught values.

**Glass detection Teach-In**

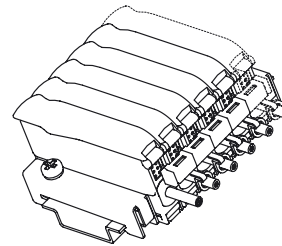


- Sensor set the optimum gain.
- Threshold is set in the middle of the 2 average taught values.

**Gang mounting**

Selection of connectable slave units on a master unit to suppress mutual interference via gang mounting

Quantity of connectable units	Function modus			
	Standard	High resolution	Auto	Glass detection
6u	6 units	6 units	6 units	6 units
12u	12 units	12 units	12 units	12 units
18u	18 units	18 units	18 units	18 units



When 12u is selected, the response time is twice (2x) of the normal value (6u).  
 When 18u is selected, the response time is triple (3x) of the normal value (6u).

Please note the protection cap of the master units.

**Menu**

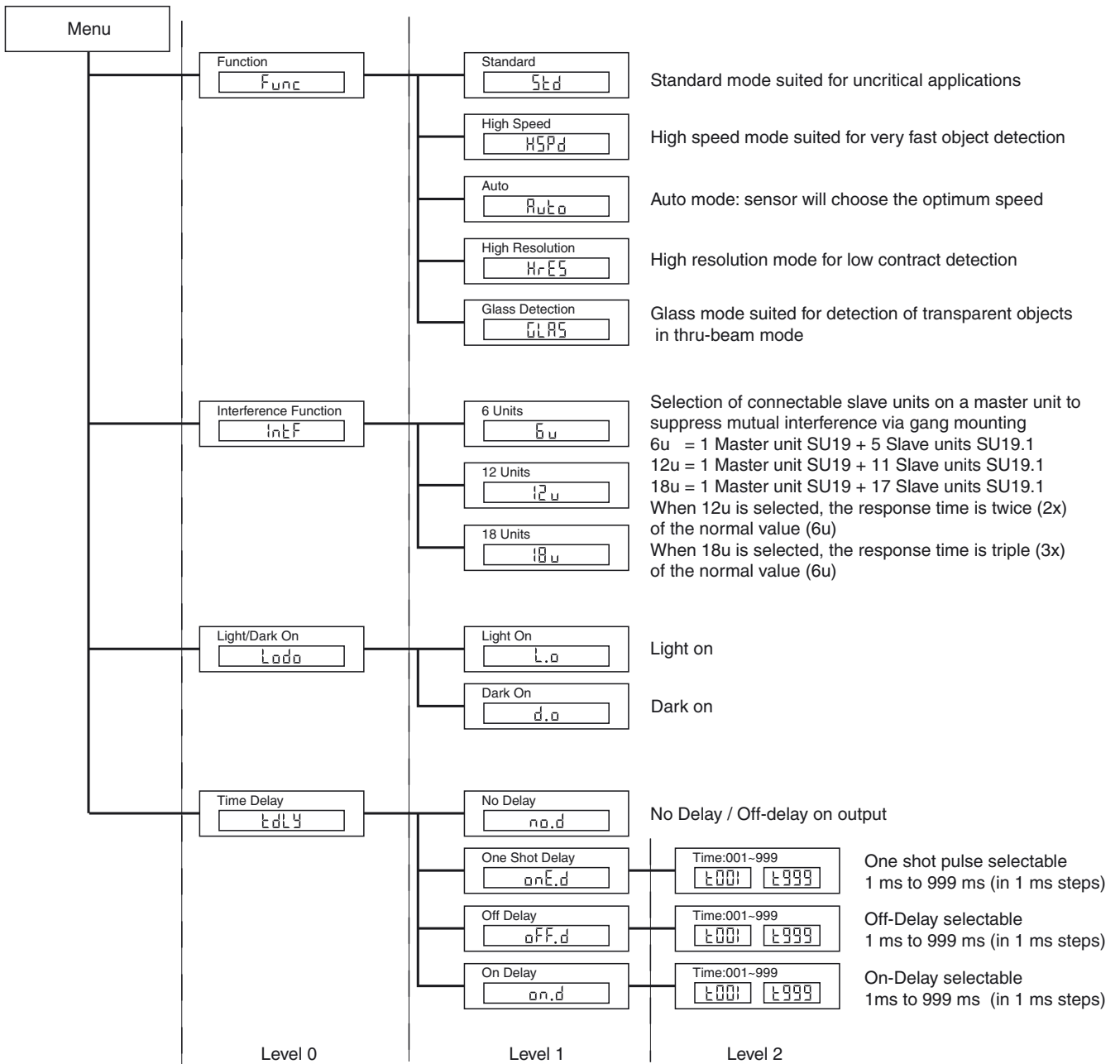
The menu structure has three levels:

Level 0: Press the "mode"-button. Select the required function via the "±" -button.  
Press the "set"-button for confirmation.

Level 1: Select the required function via the "±" -button.  
Press the "set"-button to confirm your selection.

Level 2: Use the "±" - button to select the required time delay in 1ms steps.  
Press the "set"-button to confirm your selection.

To exit the menu, press the "mode"-button.



**Appropriate fibre optics**

Suitable fiber optics can be found in the internet: [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com).

**Selection table - thru-beam fiber optic cable**

Head shape	Mounting	Model number	Core	Detection distance	Fiber cross section	minimum Object size	Fiber optic length	Bend radius	Dimensions	Special features
Highly precise										

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Head shape	Mounting	Model number	Core	Detection distance	Fiber cross section	minimum Object size	Fiber optic length	Bend radius	Dimensions	Special features
Cylindrical	dia. 1.5 mm	KHE-C01-1.0-2.0-K139	PMMA	50 mm	0.5 mm	0.05 mm	2 m	min. 1 mm		only 1 mm Bend radius
Cylindrical	dia. 3 mm	KHE-C01-2.2-2.0-K126	PMMA	50 mm	0.5 mm	0.15 mm	2 m	min. 1 mm		only 1 mm Bend radius
Cylindrical	dia. 3 mm	KHE-C01-2.2-2.0-K123	PMMA	200 mm	1 mm	0.25 mm	2 m	min. 2 mm		only 2 mm Bend radius
Right angle	dia. 15 x 5	KHE-C01-2.2-2.0-K137	PMMA	35 mm	0.5 mm	0.15 mm	2 m	min. 1 mm		only 1 mm Bend radius
Right angle	dia. 15 x 5	KHE-C01-2.2-2.0-K140	PMMA	150 mm	1 mm	0.25 mm	2 m	min. 2 mm		only 2 mm Bend radius
<b>Flexible</b>										
Threaded	M3 x 0.5 /M2.6	KLE-C01-1.3-2.0-K112	PMMA	200 mm	1 mm	0.25 mm	2 m	min. 25 mm		4 x high Detection range with Auxiliary lens K-LA01/ 8 x high Detection range with Auxiliary lens K-LA06 Side view / Periscope with K-LA02
Threaded	M3 x 0.5	KLE-C01-2.2-2.0-K103	PMMA	220 mm	1 mm	0.25 mm	2 m	min. 25 mm		
Threaded	M4 x 0.7 /M2.6	KLE-C01-2.2-2.0-K102	PMMA	220 mm	1 mm	0.25 mm	2 m	min. 25 mm		4 x high Detection range with Auxiliary lens K-LA01/ 8 x high Detection range with Auxiliary lens K-LA06 Side view / Periscope with K-LA02
Threaded	M6	KLE-C01-2.2-2.0-K100	PMMA	220 mm	1 mm	0.32 mm	2 m	min. 25 mm		
Threaded	M2.6	KLE-C01-2.2-2.0-K113	PMMA	200 mm	1 mm	0.25 mm	2 m	min. 25 mm		4 x high Detection range with Auxiliary lens K-LA01/ 8 x high Detection range with Auxiliary lens K-LA06 Side view / Periscope with K-LA02
Cylindrical	dia. 2 mm	KLE-C01-1.3-2.0-K114	PMMA	220 mm	1 mm	0.25 mm	2 m	min. 25 mm		

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Head shape	Mounting	Model number	Core	Detection distance	Fiber cross section	minimum Object size	Fiber optic length	Bend radius	Dimensions	Special features
Cylindrical	dia. 5 mm	KLE-C01-2.2-2.0-K101	PMMA	220 mm	1 mm	0.32 mm	2 m	min. 25 mm		
<b>Bendable tip</b>										
Threaded	M4	KLE 00-2.2-2.0-K55	PMMA	228 mm	1 mm		2 m	min. 25 mm		
<b>High detection range</b>										
Threaded	M3	KLE-C01-2.2-2.0-K116	PMMA	450 mm	1.5 mm	0.35 mm	2 m	min. 40 mm		
Threaded	M6	KLE-C01-2.2-2.0-K115	PMMA	450 mm	1.5 mm	0.35 mm	2 m	min. 40 mm		
Threaded	M8 x 1	FEF-PLT1	PMMA	6000 mm calculated value related on 2 m Fiber optic length	1 mm		1 m	min. 25 mm		Narrow beam
Threaded	M8 x 1	FEF-PLT1-L2	PMMA	6000 mm calculated value related on 2 m Fiber optic length	1 mm		2 m	min. 25 mm		Narrow beam
Threaded	M8 x 1	FEF-PLT1-L5	PMMA	6000 mm calculated value related on 2 m Fiber optic length	1 mm		4 m	min. 25 mm		Narrow beam
Cylindrical	dia. 3 mm	KLE-C01-2.2-2.0-K117	PMMA	400 mm	1.5 mm	0.35 mm	2 m	min. 25 mm		
<b>Side view / Periscope</b>										
Cylindrical	dia. 4.75 mm	KHE-C01-2.2-2.0-K136	PMMA	50 mm	0.5 mm	0.15 mm	2 m	min. 1 mm		only 1 mm Bend radius
Cylindrical	dia. 7 mm	KLE-C01-2.2-2.0-WC1	PMMA	120 mm	1,1 mm		2 m	min. 20 mm		
Right angle	M4	KHE-C01-2.2-2.0-K145	PMMA	112 mm			2 m	mind. 2 mm		
<b>Array</b>										

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Head shape	Mounting	Model number	Core	Detection distance	Fiber cross-section	Fiber optic length	Bend radius	Dimensions	Special features
Threaded	M4 x 0.7	KLR-C02-1.0-2.0-K73	PMMA	4 mm	2 x 0.25 mm	2 m	min. 10 mm		
Threaded	M3 x 0.5	KLR-C04-1.25-2.0-K78	PMMA	8 mm	4 x 0.25 mm	2 m	min. 15 mm		
Cylindrical	dia. 2.0 mm	KLR-C02-1.0-2.0-K91	PMMA	4 mm	2 x 0.25 mm	2 m	min. 10 mm		
Cylindrical	dia. 3.0 mm	KLR-C02-1.0-2.0-K90	PMMA	4 mm	2 x 0.25 mm	2 m	min. 10 mm		
Cylindrical	dia. 1.5 mm	KLR-C04-1.25-2.0-K80	PMMA	8 mm	4 x 0.25 mm	2 m	min. 15 mm		
Cylindrical	dia. 1.5 mm	KLR-C04-1.0-2.0-K133	PMMA	7 mm	4 x 0.25 mm	2 m	min. 15 mm		
Cylindrical	dia. 2.0 mm	KLR-C02-1.0-2.0-K87	PMMA	25 mm	2 x 0.5 mm	2 m	min. 15 mm		
Cylindrical	dia. 3.0 mm	KLR-C04-1.25-2.0-K79	PMMA	8 mm	4 x 0.25 mm	2 m	min. 15 mm		
<b>Coaxial</b>									
Threaded	M3 x 0.5	KLR-C09-1.25-2.0-K76	PMMA	30 mm	1 x 0.5 mm Emitter 9 x 0.25 mm Receiver	2 m	min. 15 mm		only 0.5 mm light spot at 8 mm with auxiliary lens K-LA03
Threaded	M4 x 0.7 /M2.6	KLR-C09-1.25-2.0-K74	PMMA	30 mm	1 x 0.5 mm Emitter 9 x 0.25 mm Receiver	2 m	min. 15 mm		only 0.7 mm light spot at 10 mm with auxiliary lens K-LA04/ 2 x high Detection range with Auxiliary lens K-LA01/ 3 x high Detection range with Auxiliary lens K-LA06
Threaded	M6 x 0.75	KLR-C16-2.2-2.0-K71	PMMA	85 mm	1 x 1.0 mm Emitter 16 x 0.25 mm Receiver	2 m	min. 25 mm		

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