



Model Number

SU19/110/115a/126a

Fiber optic sensor
with fixed cable and 4-pin, M8 connector

Features

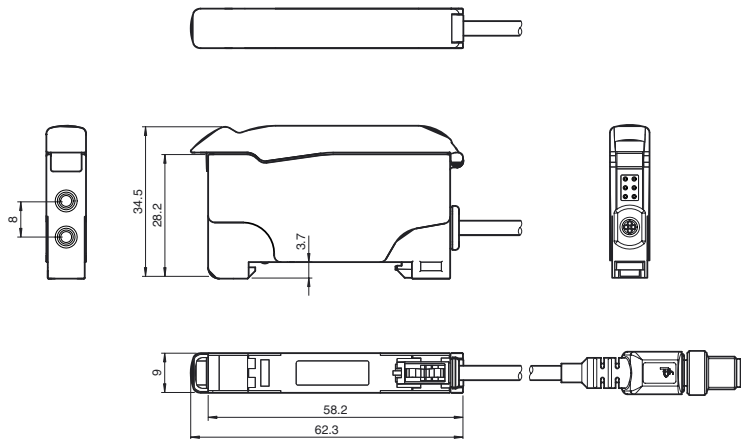
- Classic line with display
- AGC (Automatic Gain Control) for faster teach-in
- Gang mounting for easy wiring
- Transparency recognition
- 30 µs High Speed Mode
- Master module

Product information

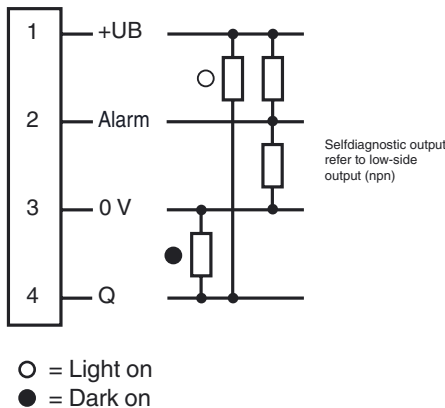
The fiber optics amplifier SU19 with display was developed to set a benchmark with the most comfortable and user-friendly interface. This simplicity of the settings decreases the costs of ownership significantly. The whole Teach-In process of objects is time-saving due to an easy Teach-In algorithm. 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



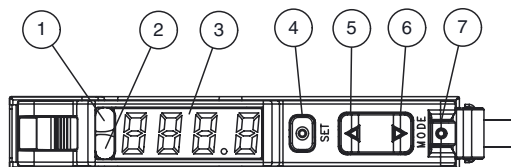
Electrical connection



Pinout



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 |

Functional safety related parameters

| | |
|--------------------------------|-------|
| MTTF _d | 500 a |
| Mission Time (T _M) | 20 a |
| Diagnostic Coverage (DC) | 0 % |

Indicators/operating means

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

Electrical specifications

| | | |
|------------------------|----------------|----------------|
| Operating voltage | U _B | 10 ... 30 V DC |
| Ripple | | 10 % |
| No-load supply current | I ₀ | ≤ 30 mA |

Output

| | | |
|-----------------------------|---|--|
| Pre-fault indication output | 1 push-pull (4 in 1) output NPN/PNP , short-circuit protected | |
| Switching type | light/dark on selectable programmable | |
| Signal output | 1 push-pull (4 in 1) output NPN/PNP , short-circuit protected | |
| Switching voltage | max. 30 V DC | |
| Switching current | max. 100 mA , resistive load | |
| Voltage drop | U _d | ≤ 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 | 200 mm, PVC cable with M8 connector, 4-pin |
| 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 | CCC approval / marking not required for products rated ≤36 V |

Accessories**HPF-D032**

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

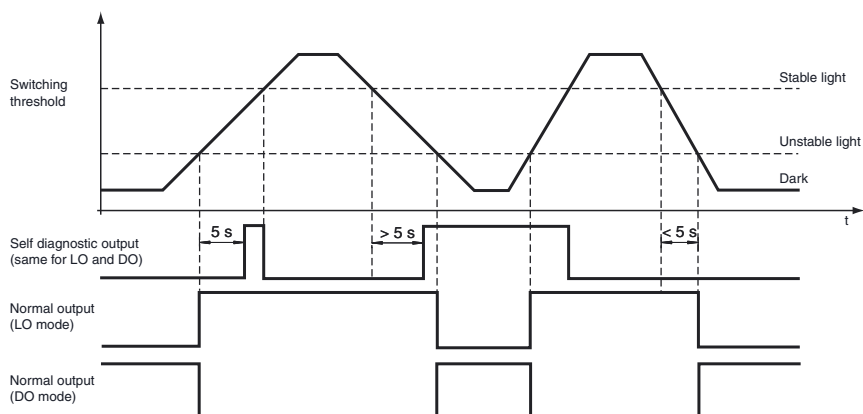
Bracket SU
Mounting bracket for DIN rail

Other suitable accessories can be found at
www.pepperl-fuchs.com

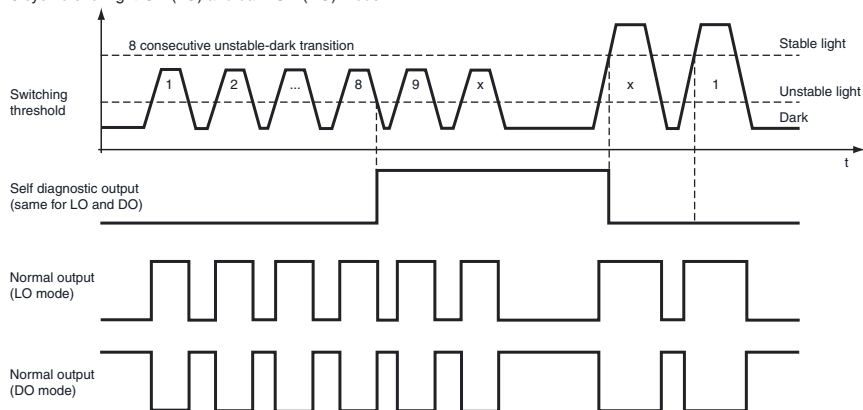
Curves/Diagrams

Self-Diagnostic definition and operation:

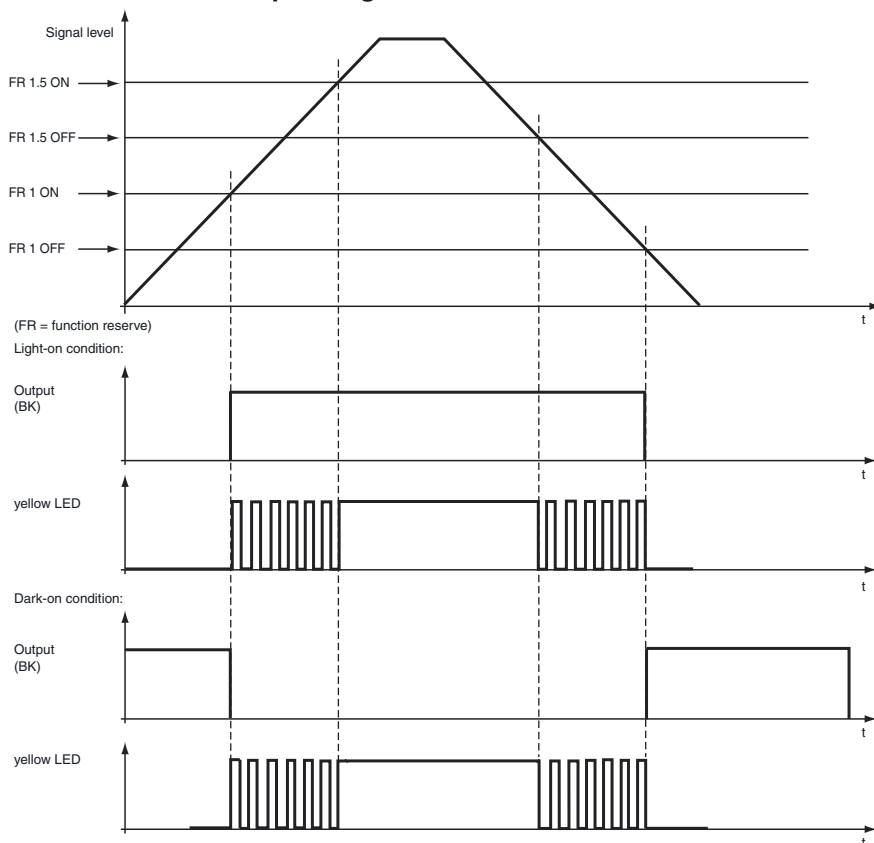
5 sec. rule for light-ON (LO) and dark-ON (DO) mode



8 cyc. rule for light-ON (LO) and dark-ON (DO) mode



LED indicators and operating chart:

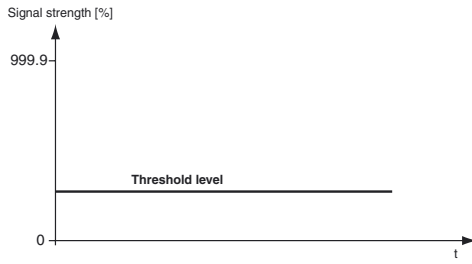


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Teach-In methods

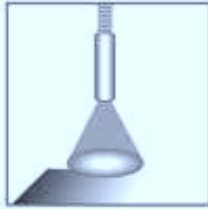
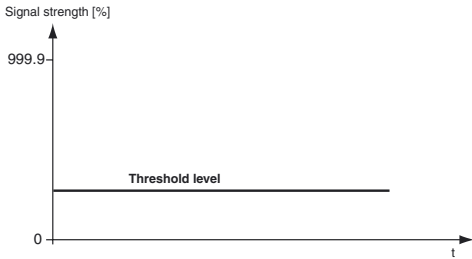
Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

Maximum Teach-In



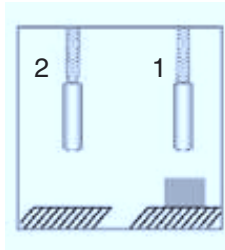
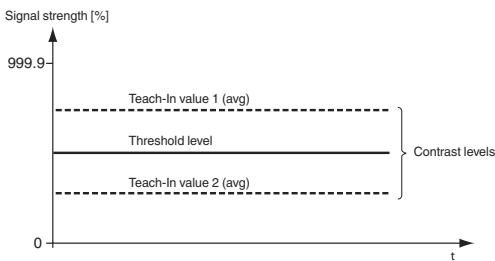
- Gain is set to maximum.
- Threshold is set to minimum.
- Maximum sensitivity is achieved.

Position Teach-In



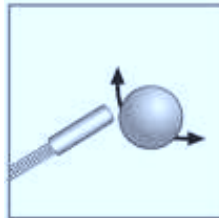
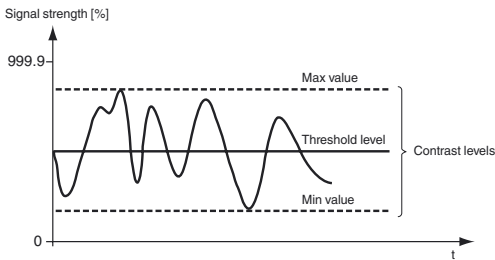
- Sensor set the optimum gain.
- Threshold is set to minimum.
- Signal received is ~ 100%.

2-Point Teach-In



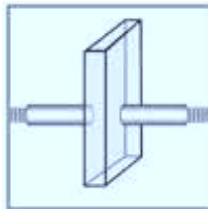
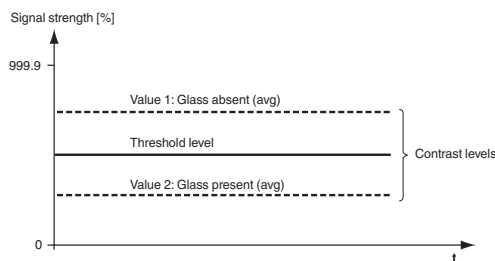
- Sensor set the optimum gain.
- Threshold is set in the middle of the 2 average taught values.

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



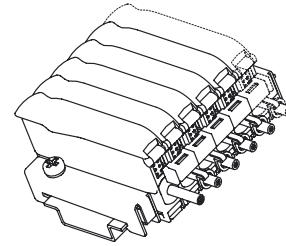
- Sensor set the optimum gain.
- Threshold is set in the middle of the 2 average taught values.

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Modular construction

Selection of the maximum number of connectible slave modules to a master module for cross-talk suppression via bridge contacts.

| Number of linkable units | Operating modes | | | |
|--------------------------|-----------------|-----------------|------------|-----------------|
| | Standard | High Resolution | Auto | Glass detection |
| 6u | 6 modules | 6 modules | 6 modules | 6 modules |
| 12u | 12 modules | 12 modules | 12 modules | 12 modules |
| 18u | 18 modules | 18 modules | 18 modules | 18 modules |



If 12u is selected, the switch-on delay doubles.

If 18u is selected, the switch-on delay triples.

When connecting several modules using bridge contacts, please ensure that the black blind pins on the bridge contacts are cut off. The outer blind pins must be retained only on the two outer bridge contacts. This is to seal off the pins that are not in use.

Master modules must **not** be connected to one another via the bridge contacts.

The power applied to the external input on the master module supplies the master module and all connected slave modules.

A master module is required to operate a slave module.

Information regarding current consumption:

- Maximum of 20 units (19 slaves per master). Maximum current consumption = 20 mA per unit.
- Maximum of 10 units (9 slaves per master). Maximum current consumption = 70 mA per unit.
- Maximum of 8 units (7 slaves per master). Maximum current consumption = 110 mA per unit.

Pay attention to the protective cover over the bridge contacts of the master modules

Menu structure

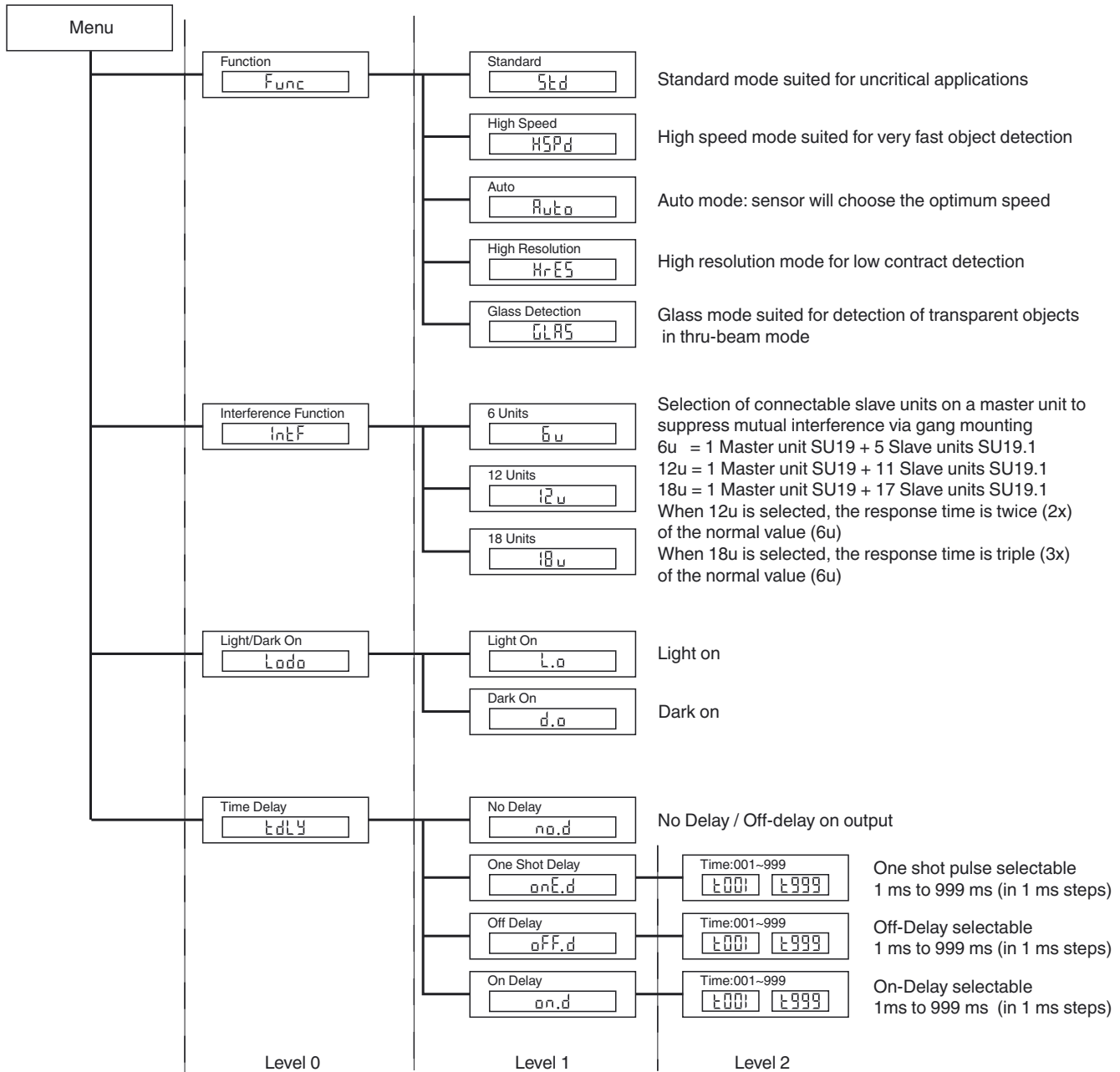
The menu structure has three levels:

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.



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 |
| Flexible | | | | | | | | | | |
| 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 | | |
| Bendable tip | | | | | | | | | | |
| Threaded | M4 | KLE 00-2.2-2.0-K55 | PMMA | 228 mm | 1 mm | | 2 m | min. 25 mm | | |
| High detection range | | | | | | | | | | |
| 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 | | |
| Side view / Periscope | | | | | | | | | | |
| 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 | | |
| Array | | | | | | | | | | |

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Pepperl+Fuchs Group
www.pepperl-fuchs.com

USA: +1 330 486 0001
fa-info@us.pepperl-fuchs.com

Germany: +49 621 776 4411
fa-info@de.pepperl-fuchs.com

Singapore: +65 6779 9091
fa-info@sg.pepperl-fuchs.com

