

Lichtleitkabelverstärker *fibre-optic-amplifiers*

Verstärker *amplifiers* | Lichtleitkabel Ø 1 - Ø 2,2 mm *plastic fibre-optic cable Ø 1 - Ø 2,2 mm*
Lichtleitkabel Adaption M18 *glas fibre-optic cable adaption M18*



Durch Lichtleiter aus Kunststoff oder Glas lässt sich Licht vom Verstärker zum Objekt und wieder zurück transportieren. Lichtleitkabelverstärker eignen sich besonders für Anwendungen unter beengten Einbaubedingungen oder bei schwierigen Umgebungsbedingungen wie z.B. hohe Temperaturen. Lichtleitkabelverstärker sind im Tast- oder Einwegbetrieb einsetzbar.

Die Reichweite ist stark von der Qualität des Lichtleitkabels abhängig. Lichtleitkabel von Eickmann-Elektronik besitzen die höchste Güte und ermöglichen eine maximale Reichweite.

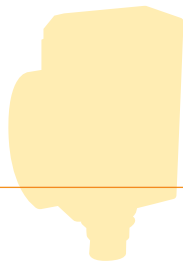
Fibre optics made of glass or plastic are used to transport the light from the sensor to the target and back. Fibre optics are especially suited for space-limited applications or for difficult environmental conditions e.g. high temperature applications. Fibre optic sensors come as opposed, retro-reflective and diffuse mode types.

The sensing range largely depends on the quality of the fibre optic cable. Eickmann fibre optic cables possess the highest quality and allows the maximum sensing range.

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fibre-optic-amplifiers

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Lichtleitkabel Adaption M18 *glas fibre-optic cable adaption M18*



- + Robuste Gehäuse, integrierte Elektronik *tough housing with integrated electronics*
- + Einfache und schnelle Montage *simple and fast assembling*
- + Hohe Schutzart IP67 *high protection class IP67*
- + Hohe Schaltfrequenz *high switching frequency*
- + Empfindlichkeitseinstellung *sensitivity adjustable*
- + Rot- und Infrarotlichtausführungen *red- and infrared light*
- + Normstecker M8 und M12 *connector M8 and M12*
- + Ausgänge kurzschlußfest *output short circuit proof*
- + Erfassung kleinster Teile *detection of smallest items*
- + Garantie 2 Jahre *warranty 2 years*
- + Anwendungsbezogene Sonderausführungen möglich *special sizes are available on request*

Lichtleitkabelverstärker
fibre-optic-amplifiers

Typenschlüssel *coding*

OLK - 40 - P U K I - ST4

OLK

OLK = Verstärker Adaption LLK *amplifier adaption LLK (glas)*
LKV = Verstärker Adaption KLLK *amplifier adaption KLLK (plastic)*

40

Dimension *dimension*

P

P = pnp | A = Analogausgang *analog*

U

U = NO-NC | S = NO | O = NC | V = Spannungsausgang *voltage output*

K

K = Kurzschlußfest *short circuit proof*

(X)

I = Infrarot *infrared*

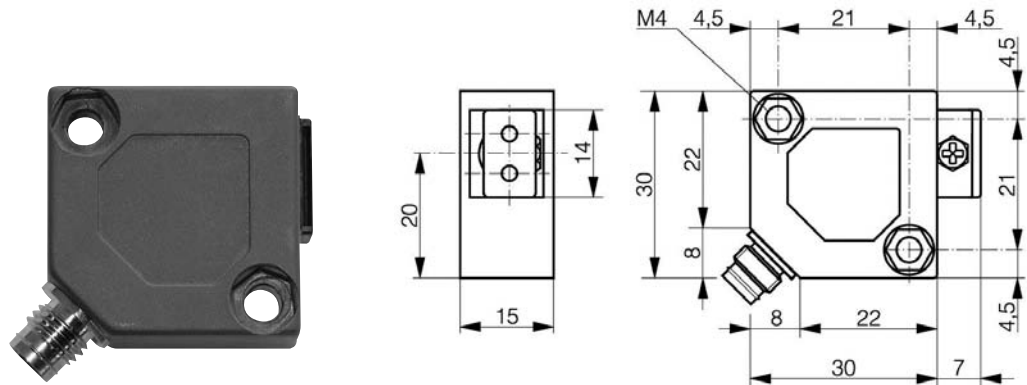
ST4

ST3 = Stecker M8 *connector M8* | ST4 = Stecker M12 *connector M12*
ST3-4 = Stecker M8 4polig *connector M8 4pole*

Lichtleitkabelverstärker *fibre-optic-amplifiers*

Verstärker *amplifiers*

Bauform (B x H x T) <i>dimension (W x H x D)</i>	15 x 30 x 30 mm
Anschluss <i>connection</i>	Stecker M8 <i>connector M8</i>
Empfindlichkeit <i>sensitivity</i>	einstellbar / Poti <i>adjustable / potentiometer</i>



Betriebsspannung <i>service voltage</i>	10-35 VDC
Eigenstromaufnahme <i>internal power consumpt.</i>	< 15 mA
Spannungsabfall <i>voltage drop</i>	< 2 V
Schalthysterese <i>switching hysteresis</i>	< 10 %
Reproduzierbarkeit <i>reproducibility</i>	abhängig vom Lichtleiter <i>dependent on optic cable</i>
Umgebungstemperatur <i>ambient temperature</i>	- 10°C ... + 60°C
Schutzart <i>protection class</i>	IP 65
Sendelicht <i>emitted light</i>	rot / getaktet <i>red / clocked</i>
Gehäusematerial <i>casing material</i>	PBTP
Isolationsspannung <i>insulation voltage endurance</i>	500 V
Fremdlichtfestigkeit <i>ambient light immunity</i>	10 klx
Reichweite Taster/Einweg <i>sensing range</i>	100 mm / 250 mm abhängig vom Lichtleiter <i>dependent on optic cable</i>
max. Laststrom <i>max. load current</i>	200 mA / kurzschlußfest <i>short-circuit-proof</i>
Schaltfrequenz <i>max. operating frequency</i>	1,0 kHz
Lichtleiter <i>fibre optics</i>	KLLK ...

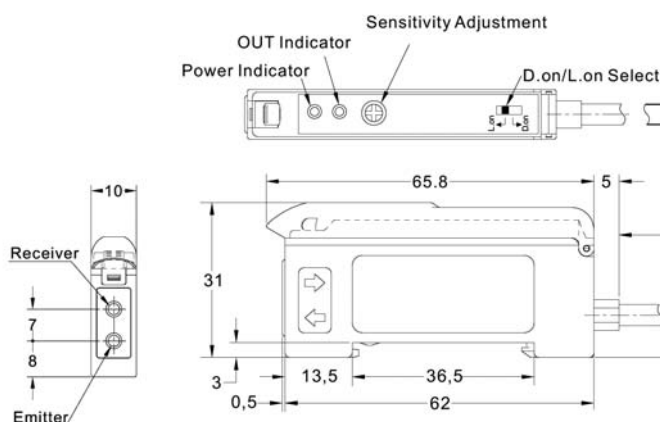
Schema <i>diagramm</i>	Ausgang <i>output</i>	
1	PNP-NO	LKV-15-PSK-ST3

Lichtleitkabelverstärker
fibre-optic-amplifiers

Lichtleitkabelverstärker *fibre-optic-amplifiers*

Verstärker *amplifiers*

Bauform (B x H x T) <i>dimension (W x H x D)</i>	10 x 65,8 x 31 mm
Anschluss <i>connection</i>	15 cm Kabel Stecker M12 <i>15 cm cable connector M12</i>
Empfindlichkeit <i>sensitivity</i>	einstellbar <i>adjustable</i>



Lichtleitkabelverstärker
fibre-optic-amplifiers

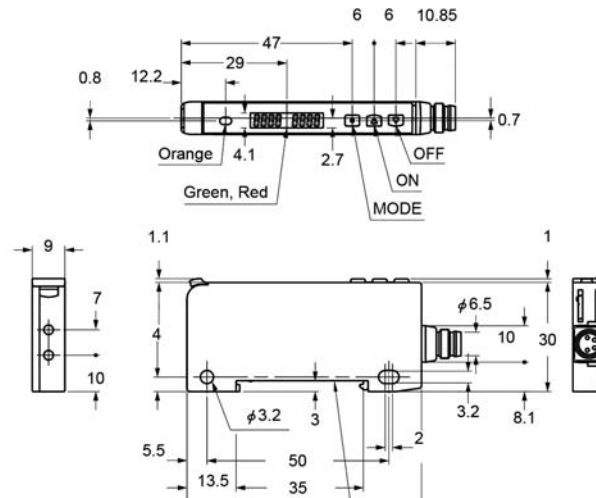
Betriebsspannung <i>service voltage</i>	12-26 VDC
Eigenstromaufnahme <i>internal power consumpt.</i>	< 35 mA
Spannungsabfall <i>voltage drop</i>	< 1 V
Schalthysterese <i>switching hysteresis</i>	< 10 %
Reproduzierbarkeit <i>reproducibility</i>	abhängig vom Lichtleiter <i>dependent on optic cable</i>
Umgebungstemperatur <i>ambient temperature</i>	- 20°C ... + 60°C
Schutzart <i>protection class</i>	IP 65
Sendelicht <i>emitted light</i>	rot / getaktet <i>red / clocked</i>
Gehäusematerial <i>casing material</i>	ABS
Isolationsspannung <i>insulation voltage endurance</i>	500 V
Fremdlichtfestigkeit <i>ambient light immunity</i>	50 klx
Reichweite Taster/Einweg <i>sensing range</i>	80 mm / 200 mm abhängig vom Lichtleiter <i>dependent on optic cable</i>
max. Laststrom <i>max. load current</i>	100 mA / kurzschlußfest <i>short-circuit-proof</i>
Schaltfrequenz <i>max. operating frequency</i>	1,0 kHz
Lichtleiter <i>fibre optics</i>	KLLK ...

Schema <i>diagramm</i>	Ausgang <i>output</i>	
3	PNP -NO/NC	LKV-70-PUK-KST4

Lichtleitkabelverstärker *fibre-optic-amplifiers*

Verstärker *amplifiers*

Bauform (B x H x T) <i>dimension (W x H x D)</i>	9 x 64,5 x 30 mm
Anschluss <i>connection</i>	Stecker M8-4 polig <i>connector M8 4pole</i>
Empfindlichkeit <i>sensitivity</i>	einstellbar / teach in <i>adjustable / teach in</i>



Betriebsspannung <i>service voltage</i>	12-26 VDC
Eigenstromaufnahme <i>internal power consumpt.</i>	< 30 mA
Spannungsabfall <i>voltage drop</i>	< 2,5 V
Schalthyserese <i>switching hysteresis</i>	< 10 %
Reproduzierbarkeit <i>reproducibility</i>	abhängig vom Lichtleiter <i>dependent on optic cable</i>
Impulsverlängerung <i>impulse stretching</i>	1-1000 ms einstellbar <i>adjustable</i>
Umgebungstemperatur <i>ambient temperature</i>	- 25°C ... + 55°C
Schutzart <i>protection class</i>	IP 65
Sendelicht <i>emitted light</i>	rot / getaktet <i>red / clocked</i>
Gehäusematerial <i>casing material</i>	Polycarbonate
Isolationsspannung <i>insulation voltage endurance</i>	1000 V
Fremdlichtfestigkeit <i>ambient light immunity</i>	70 klx
Reichweite Taster/Einweg <i>sensing range</i>	80 mm / 200 mm abhängig vom Lichtleiter <i>dependent on optic cable</i>
max. Laststrom <i>max. load current</i>	100 mA / kurzschlußfest <i>short-circuit-proof</i>
Schaltfrequenz <i>max. operating frequency</i>	1,0 kHz
Lichtleiter <i>fibre optics</i>	KLLK ...

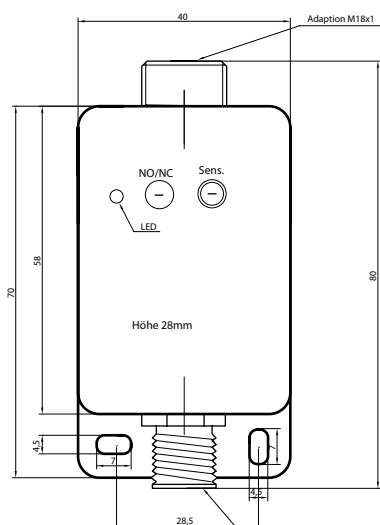
Schema <i>diagramm</i>	Ausgang <i>output</i>
3	PNP-NO/NC LKV-100-PUK-ST3-4

Lichtleitkabelverstärker
fibre-optic-amplifiers

Lichtleitkabelverstärker *fibre-optic-amplifiers*

Verstärker *amplifiers*

Bauform (B x H x T) <i>dimension (W x H x D)</i>	40 x 28 x 80 mm
Anschluss <i>connection</i>	Stecker M12 <i>connector M12</i>
Empfindlichkeit <i>sensitivity</i>	einstellbar / Poti <i>adjustable / Poti</i>



Lichtleitkabelverstärker
fibre-optic-amplifiers

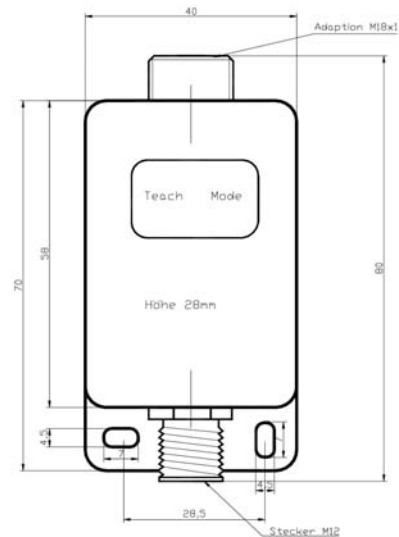
Betriebsspannung <i>service voltage</i>	10-30 VDC
Eigenstromaufnahme <i>internal power consumpt.</i>	< 40 mA
Spannungsabfall <i>voltage drop</i>	< 2,5 V
Schalthyserese <i>switching hysteresis</i>	< 10 %
Reproduzierbarkeit <i>reproducibility</i>	abhängig vom Lichtleiter <i>dependent on optic cable</i>
Impulsverlängerung <i>impulse stretching</i>	–
Umgebungstemperatur <i>ambient temperature</i>	- 25°C ... + 55°C
Schutzart <i>protection class</i>	IP 67
Sendelicht <i>emitted light</i>	IR / getaktet <i>IR / clocked</i>
Gehäusematerial <i>casing material</i>	Alu / blau eloxiert <i>aluminium / blue anodised</i>
Isolationsspannung <i>insulation voltage endurance</i>	500 V
Fremdlichtfestigkeit <i>ambient light immunity</i>	70 klx
Reichweite Taster/Einweg <i>sensing range</i>	150 mm / 1200 mm abhängig vom Lichtleiter <i>dependent on optic cable</i>
max. Laststrom <i>max. load current</i>	200 mA / kurzschlussfest <i>short-circuit-proof</i>
Schaltfrequenz <i>max. operating frequency</i>	1,0 kHz
Lichtleiter <i>fibre optics</i>	LLK ...

Schema <i>diagramm</i>	Ausgang <i>output</i>	
3	PNP-NO/NC	OLK-40-PUKI-ST4

Lichtleitkabelverstärker *fibre-optic-amplifiers*

Verstärker *amplifiers*

Bauform (B x H x T) <i>dimension (W x H x D)</i>	40 x 28 x 80 mm
Anschluss <i>connection</i>	Stecker M12 <i>connector M12</i>
Empfindlichkeit <i>sensitivity</i>	einstellbar / teach in <i>adjustable / teach in</i>



Betriebsspannung <i>service voltage</i>	10-30 VDC
Eigenstromaufnahme <i>internal power consumpt.</i>	< 40 mA
Spannungsabfall <i>voltage drop</i>	< 2,5 V
Schalthysterese <i>switching hysteresis</i>	< 10 %
Reproduzierbarkeit <i>reproducibility</i>	abhängig vom Lichtleiter <i>dependent on optic cable</i>
Impulsverlängerung <i>impulse stretching</i>	0 – 1 sec.
Umgebungstemperatur <i>ambient temperature</i>	- 25°C ... + 55°C
Schutzart <i>protection class</i>	IP 67
Sendelicht <i>emitted light</i>	IR / getaktet <i>IR / clocked</i>
Gehäusematerial <i>casing material</i>	Alu / blau eloxiert <i>aluminium / blue anodised</i>
Isolationsspannung <i>insulation voltage endurance</i>	500 V
Fremdlichtfestigkeit <i>ambient light immunity</i>	70 klx
Reichweite Taster/Einweg <i>sensing range</i>	150 mm / 1200 mm abhängig vom Lichtleiter <i>dependent on optic cable</i>
max. Laststrom <i>max. load current</i>	200 mA / kurzschlußfest <i>short-circuit-proof</i>
Schaltfrequenz <i>max. operating frequency</i>	1,0 kHz
Lichtleiter <i>fibre optics</i>	LLK ...

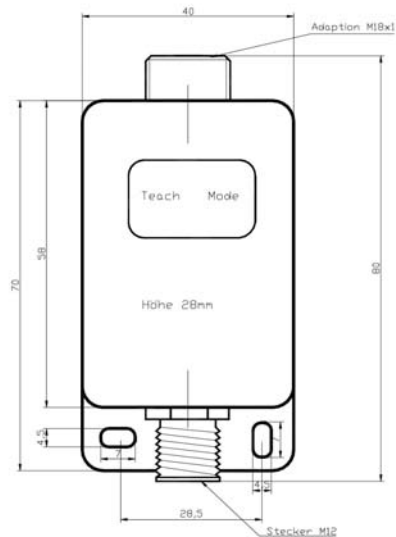
Schema <i>diagramm</i>	Ausgang <i>output</i>	
3	PNP-NO/NC	OLKT-40-PUKI-ST4

Lichtleitkabelverstärker
fibre-optic-amplifiers

Lichtleitkabelverstärker *fibre-optic-amplifiers*

Verstärker *amplifiers*

Bauform (B x H x T) <i>dimension (W x H x D)</i>	40 x 28 x 80 mm
Anschluss <i>connection</i>	Stecker M12 <i>connector M12</i>
Empfindlichkeit <i>sensitivity</i>	einstellbar / teach in <i>adjustable / teach in</i>
Ausgang <i>output</i>	Analog 0 - 10 VDC



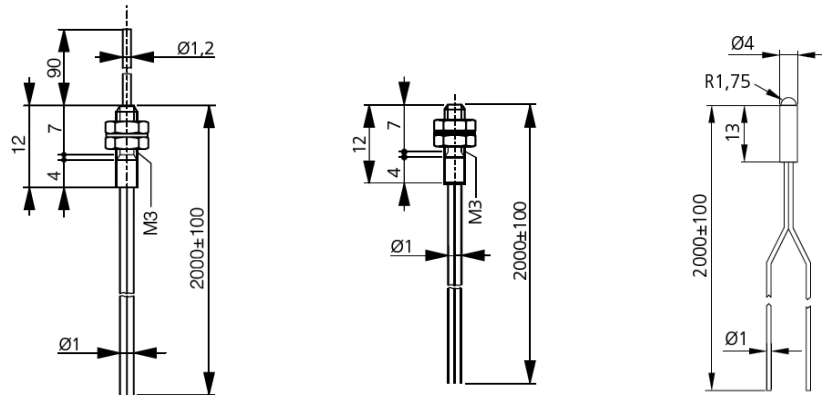
Lichtleitkabelverstärker
fibre-optic-amplifiers

Betriebsspannung <i>service voltage</i>	10-30 VDC
Eigenstromaufnahme <i>internal power consumpt.</i>	< 40 mA
Spannungsabfall <i>voltage drop</i>	< 2,5 V
Schalthysterese <i>switching hysteresis</i>	< 10 %
Reproduzierbarkeit <i>reproducibility</i>	abhängig vom Lichtleiter <i>dependent on optic cable</i>
Impulsverlängerung <i>impulse stretching</i>	–
Umgebungstemperatur <i>ambient temperature</i>	0°C ... + 55°C
Schutzart <i>protection class</i>	IP 67
Sendelicht <i>emitted light</i>	IR / getaktet <i>IR / clocked</i>
Gehäusematerial <i>casing material</i>	Alu / blau eloxiert <i>aluminium / blue anodised</i>
Isolationsspannung <i>insulation voltage endurance</i>	500 V
Fremdlichtfestigkeit <i>ambient light immunity</i>	70 klx
Reichweite Taster/Einweg <i>sensing range</i>	150 mm / 1200 mm abhängig vom Lichtleiter <i>dependent on optic cable</i>
max. Laststrom <i>max. load current</i>	10 mA
Schaltfrequenz <i>max. operating frequency</i>	1,0 kHz
Lichtleiter <i>fibre optics</i>	LLK ...

Schema <i>diagramm</i>	Ausgang <i>output</i>	
14	analog	OLKT-40-AV-ST4

Lichtleitkabel Ø 1 - Ø 2,2 mm *plastic fibre-optic cable Ø 1 - Ø 2,2 mm*

Funktion <i>function</i>	Taster <i>diffuse reflective sensor</i>		
Lichtleiter <i>fibre optics</i>	Ø 1 mm		
Besonderheit <i>feature</i>	max. Auflösung <i>max. resolution</i>	max. Auflösung <i>max. resolution</i>	Kugeloptik <i>spherical optic</i>



Umgebungstemperatur <i>ambient temperature</i>	-25°C ... + 70°C		
Lichtfaser <i>single fibre</i>	Ø 0,5 mm		
Öffnungswinkel <i>angle of beam</i>	56°		
Schutzart <i>protection class</i>	IP 67		
Biegeradius <i>bending radius</i>	≥15 mm		
Biegeradius Tastkopf <i>bending radius of probe</i>	—	≥25 mm	—
Material Tastkopf <i>material sensor probe</i>	—	VA	—
Material Gewindehülse <i>material thread sleeves</i>	Messing vernickelt <i>brass nickel plated</i>	Messing vernickelt <i>brass nickel plated</i>	VA
Material Faser <i>material fibre</i>	PMMA		
Material Ummantelung <i>material jacket</i>	PE		
Länge Lichtleiter <i>length fibre optic cable</i>	2000 mm		
Vorsatzoptik <i>auxiliary optic</i>	—		

max. Reichweite <i>max. scanning range</i>			
LKV-15...	20 mm	20 mm	60 mm
LKV-32...	15 mm	10 mm	25 mm
LKV-170...	70 mm	70 mm	140 mm

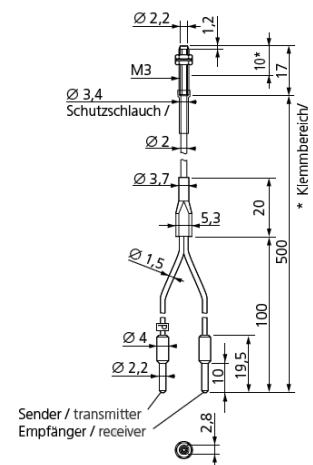
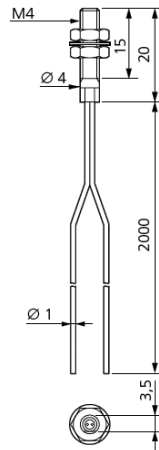
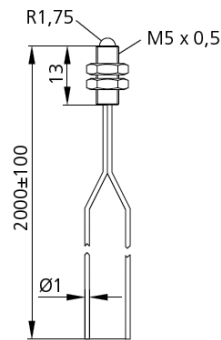
Type <i>type</i>	KLLKT 2000 K-M3-0.5	KLLKT 2000 KB-M3-0.5	KLLKT 2000 K-4-Z8
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Lichtleitkabelverstärker
fibre-optic-amplifiers

Lichtleiter KLLK ... fibre optics KLLK ...

Lichtleitkabel Ø 1 - Ø 2,2 mm plastic fibre-optic cable Ø 1 - Ø 2,2 mm

Funktion <i>function</i>	Taster <i>diffuse reflective sensor</i>		
Lichtleiter <i>fibre optics</i>	Ø 1 mm	Ø 1 mm	Ø 2,2 mm
Besonderheit <i>feature</i>	Kugeloptik <i>spherical optic</i>	kleiner Tastkopf <i>small sensor probe</i>	koaxial Faser-Anordnung <i>coaxial fibre config.</i>



Umgebungstemperatur <i>ambient temperature</i>	-25°C ... + 70°C	-40°C ... + 70°C	-20°C ... + 60°C
Lichtfaser <i>single fibre</i>	Ø 0,5 mm		
Öffnungswinkel <i>angle of beam</i>	56°		
Schutzart <i>protection class</i>	IP 67		
Biegeradius <i>bending radius</i>	≥15 mm	≥25 mm	≥25 mm
Biegeradius Tastkopf <i>bending radius of probe</i>	–		
Material Tastkopf <i>material sensor probe</i>	–		
Material Gewindehülse <i>material thread sleeves</i>	VA	Messing vernickelt <i>brass nickel plated</i>	Messing vernickelt <i>brass nickel plated</i>
Material Faser <i>material fibre</i>	PMMA		
Material Ummantelung <i>material jacket</i>	PE	PE	Polyoefin
Länge Lichtleiter <i>length fibre optic cable</i>	2000 mm	2000 mm	500 mm
Vorsatzoptik <i>auxiliary optic</i>	–	–	VO-M3

max. Reichweite *max. scanning range*

LKV-15...	60 mm	30 mm	–
LKV-32...	25 mm	15 mm	–
LKV-170...	140 mm	80 mm	9 mm / 13mm (VO-M3)

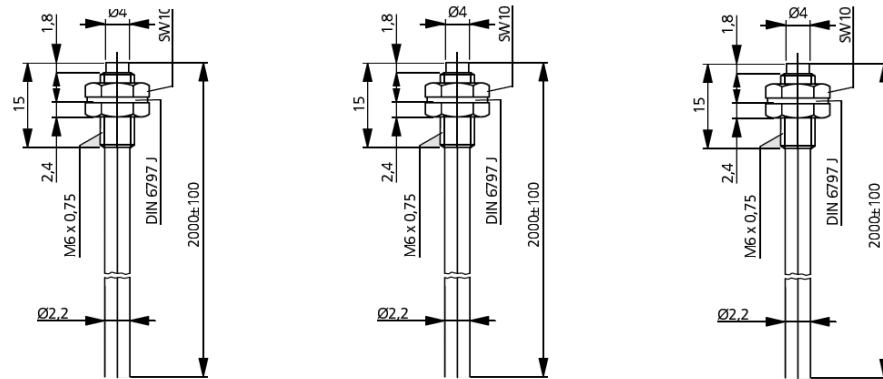
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Lichtleitkabelverstärker
fibre-optic-amplifiers

Lichtleiter KLLK ... fibre optics KLLK ...

Lichtleitkabel Ø 1 - Ø 2,2 mm plastic fibre-optic cable Ø 1 - Ø 2,2 mm

Funktion <i>function</i>	Taster <i>diffuse reflective sensor</i>		
Lichtleiter <i>fibre optics</i>	Ø 2,2 mm		
Besonderheit <i>feature</i>	großer Schaltabstand <i>large scanning range</i>	kleiner Biegeradius <i>small bending radius</i>	koaxial Faser-Anordnung <i>coaxial fibre config.</i>



Umgebungstemperatur <i>ambient temperature</i>	-25°C ... + 70°C		
Lichtfaser <i>single fibre</i>	Ø 1 mm		
Öffnungswinkel <i>angle of beam</i>	56°		
Schutzart <i>protection class</i>	IP 67		
Biegeradius <i>bending radius</i>	≥ 25 mm	≥ 5 mm	≥ 25 mm
Biegeradius Tastkopf <i>bending radius of probe</i>	-		
Material Tastkopf <i>material sensor probe</i>	-		
Material Gewindehülse <i>material thread sleeves</i>	VA	Messing vernickelt <i>brass nickel plated</i>	Messing vernickelt <i>brass nickel plated</i>
Material Faser <i>material fibre</i>	PMMA		
Material Ummantelung <i>material jacket</i>	PE		
Länge Lichtleiter <i>length fibre optic cable</i>	2000 mm		
Vorsatzoptik <i>auxiliary optic</i>	-		

max. Reichweite *max. scanning range*

LKV-15...	60 mm	45 mm	60 mm
LKV-32...	45 mm	25 mm	40 mm
LKV-170...	200 mm	150 mm	200 mm

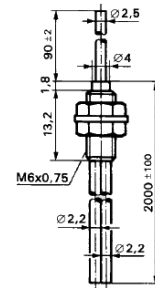
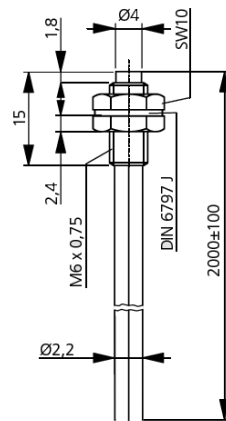
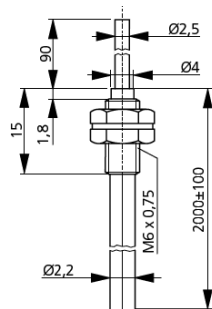
Type <i>type</i>	KLLKT 2000 K-M6-1,0	KLLKT 2000 KF-M6-1,0	KLLKT 2000 K-M6x16-1,0
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Lichtleitkabelverstärker
fibre-optic-amplifiers

Lichtleiter KLLK ... fibre optics KLLK ...

Lichtleitkabel Ø 1 - Ø 2,2 mm plastic fibre-optic cable Ø 1 - Ø 2,2 mm

Funktion <i>function</i>	Taster <i>diffuse reflective sensor</i>		
Lichtleiter <i>fibre optics</i>	Ø 2,2 mm		
Besonderheit <i>feature</i>	biegbarer Tastkopf <i>bending sensor probe</i>	großer Schaltabstand <i>large scanning range</i>	biegbarer Tastkopf / VA <i>bending sensor probe</i>



Lichtleitkabelverstärker
fibre-optic-amplifiers

Umgebungstemperatur <i>ambient temperature</i>	-25°C ... + 70°C		
Lichtfaser <i>single fibre</i>	Ø 1 mm		
Öffnungswinkel <i>angle of beam</i>	56°	56°	58°
Schutzart <i>protection class</i>	IP 67		
Biegeradius <i>bending radius</i>	≥ 5 mm	≥ 40 mm	≥ 25 mm
Biegeradius Tastkopf <i>bending radius of probe</i>	≥ 25 mm	-	≥ 25 mm
Material Tastkopf <i>material sensor probe</i>	VA	-	VA
Material Gewindehülse <i>material thread sleeves</i>	Messing vernickelt <i>brass nickel plated</i>		
Material Faser <i>material fibre</i>	PMMA		
Material Ummantelung <i>material jacket</i>	PE		
Länge Lichtleiter <i>length fibre optic cable</i>	2000 mm		
Vorsatzoptik <i>auxiliary optic</i>	-		

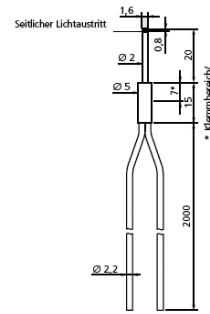
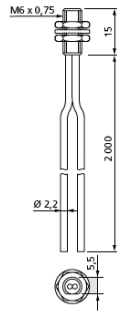
max. Reichweite *max. scanning range*

LKV-15...	60 mm	45 mm	60 mm
LKV-32...	45 mm	25 mm	40 mm
LKV-170...	200 mm	150 mm	200 mm

Type <i>type</i>	KLLKT 2000 KBF-M6-1,0	KLLKT 2000 KH-M6-1,0	KLLK 150 KB-2,5-1,5
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Lichtleitkabel Ø 1 - Ø 2,2 mm *plastic fibre-optic cable Ø 1 - Ø 2,2 mm*

Funktion <i>function</i>	Taster <i>diffuse reflective sensor</i>	
Lichtleiter <i>fibre optics</i>	Ø 2,2 mm	
Besonderheit <i>feature</i>	kostengünstig <i>low price</i>	seitlicher Lichtaustritt <i>lateral light emission</i>



Umgebungstemperatur <i>ambient temperature</i>	-40°C ... + 70°C	-20°C ... + 60°C
Lichtfaser <i>single fibre</i>	Ø 1 mm	Ø 0,8 mm
Öffnungswinkel <i>angle of beam</i>	56°	58°
Schutzart <i>protection class</i>	IP 67	
Biegeradius <i>bending radius</i>	≥ 25 mm	
Biegeradius Tastkopf <i>bending radius of probe</i>	-	
Material Tastkopf <i>material sensor probe</i>	-	VA
Material Gewindehülse <i>material thread sleeves</i>	Messing vernickelt <i>brass nickel plated</i>	VA
Material Faser <i>material fibre</i>	PMMA	
Material Ummantelung <i>material jacket</i>	PE	
Länge Lichtleiter <i>length fibre optic cable</i>	2000 mm	
Vorsatzoptik <i>auxiliary optic</i>	-	

max. Reichweite *max. scanning range*

LKV-15...	10 mm	25 mm
LKV-32...	90 mm	15 mm
LKV-170...	250 mm	50 mm

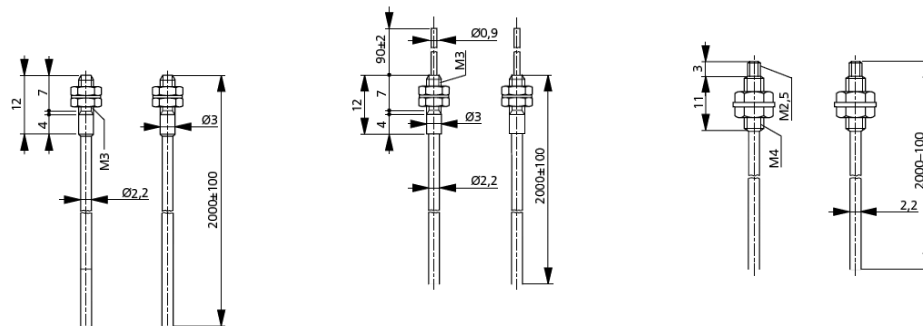
Type <i>type</i>	KLLKT 2000 K-M6-1,5	KLLKT 2000 KR-5,0-2,0
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Lichtleitkabelverstärker
fibre-optic-amplifiers

Lichtleiter KLLK ... fibre optics KLLK ...

Lichtleitkabel Ø 1 - Ø 2,2 mm plastic fibre-optic cable Ø 1 - Ø 2,2 mm

Funktion <i>function</i>	Einweg <i>through beam sensor</i>		
Lichtleiter <i>fibre optics</i>	Ø 2,2 mm		
Besonderheit <i>feature</i>	max. Auflösung <i>max. resolution</i>	großer Schaltabstand <i>large scanning range</i>	kleiner Biegeradius <i>small bending radius</i>



Umgebungstemperatur <i>ambient temperature</i>	-25°C ... + 70°C		
Lichtfaser <i>single fibre</i>	Ø 0,5 mm	Ø 0,5 mm	Ø 1 mm
Öffnungswinkel <i>angle of beam</i>	56°		
Schutzart <i>protection class</i>	IP 67		
Biegeradius <i>bending radius</i>	≥ 25 mm	≥ 25 mm	≥ 5 mm
Biegeradius Tastkopf <i>bending radius of probe</i>	—	≥ 25 mm	—
Material Tastkopf <i>material sensor probe</i>	—	VA	—
Material Gewindehülse <i>material thread sleeves</i>	Messing vernickelt <i>brass nickel plated</i>		
Material Faser <i>material fibre</i>	PMMA		
Material Ummantelung <i>material jacket</i>	PE		
Länge Lichtleiter <i>length fibre optic cable</i>	2000 mm		
Vorsatzoptik <i>auxiliary optic</i>	—	—	VO-2,5 / VO-2,5-90°

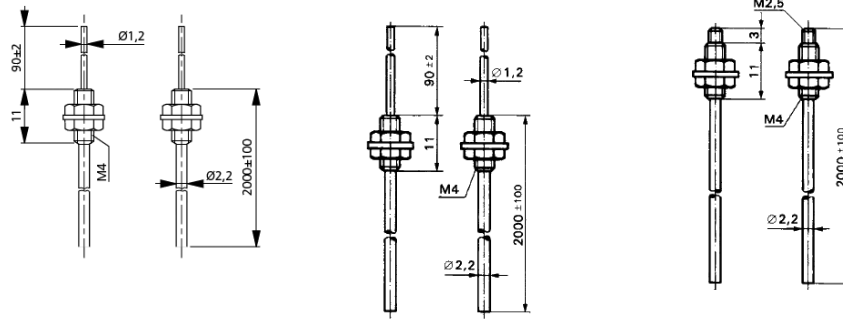
max. Reichweite <i>max. scanning range</i>			
LKV-15...	60 mm	45 mm	60 mm
LKV-32...	45 mm	25 mm	40 mm
LKV-170...	200 mm	150 mm	200 mm

Type <i>type</i>	KLLKE 2000 K-M3-1,0	KLLKE 2000 KB-M3-0,5	KLLKE 2000 KF-M4-M2,5-1,0
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Lichtleitkabelverstärker
fibre-optic-amplifiers

Lichtleitkabel Ø 1 - Ø 2,2 mm *plastic fibre-optic cable Ø 1 - Ø 2,2 mm*

Funktion <i>function</i>	Einweg <i>through beam sensor</i>		
Lichtleiter <i>fibre optics</i>	Ø 2,2 mm		
Besonderheit <i>feature</i>	kleiner Biegeradius <i>small bending radius</i>	großer Schaltabstand <i>large scanning range</i>	Vorsatzoptik einsetzbar <i>auxiliary optic applicable</i>



Umgebungstemperatur <i>ambient temperature</i>	-25°C ... + 70°C	-25°C ... + 70°C	-35°C ... + 85°C
Lichtfaser <i>single fibre</i>	Ø 1 mm	Ø 1 mm	Ø 1 mm
Öffnungswinkel <i>angle of beam</i>	56°	58°	58°
Schutzart <i>protection class</i>	IP 67	IP 67	IP 67
Biegeradius <i>bending radius</i>	≥ 5 mm	≥ 22 mm	≥ 22 mm
Biegeradius Tastkopf <i>bending radius of probe</i>	≥ 25 mm	≥ 25 mm	—
Material Tastkopf <i>material sensor probe</i>	VA	VA	—
Material Gewindehülse <i>material thread sleeves</i>	Messing vernickelt <i>brass nickel plated</i>		
Material Faser <i>material fibre</i>	PMMA		
Material Ummantelung <i>material jacket</i>	PE		
Länge Lichtleiter <i>length fibre optic cable</i>	2000 mm		
Vorsatzoptik <i>auxiliary optic</i>	—	—	VO-2,5 / VO-2,5-90°

max. Reichweite *max. scanning range*

LKV-15...	150 mm	400 mm	200 mm
LKV-32...	100 mm	150 mm	160 mm
LKV-170...	500 mm	700 mm	700 mm

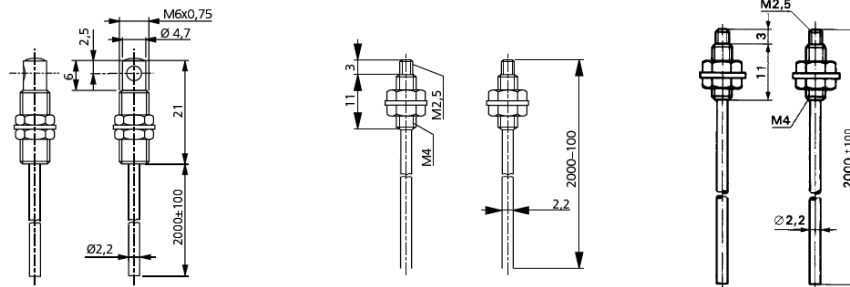
Type <i>type</i>	KLLKE 2000 KBF-M4-1,0	KLLK 250 KB-1,2-1,0	KLLK 250 K-M4-M2,5-1,0
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Lichtleitkabelverstärker
fibre-optic-amplifiers

Lichtleiter KLLK ... fibre optics KLLK ...

Lichtleitkabel Ø 1 - Ø 2,2 mm plastic fibre-optic cable Ø 1 - Ø 2,2 mm

Funktion <i>function</i>	Einweg <i>through beam sensor</i>		
Lichtleiter <i>fibre optics</i>	Ø 2,2 mm		
Besonderheit <i>feature</i>	seitlicher Lichtaustritt <i>lateral light emission</i>	großer Schaltabstand <i>large scanning range</i>	großer Schaltabstand <i>large scanning range</i>



Umgebungstemperatur <i>ambient temperature</i>	-25°C ... + 70°C	-25°C ... + 70°C	-40°C ... + 70°C
Lichtfaser <i>single fibre</i>	Ø 1 mm	Ø 1 mm	Ø 1 mm
Öffnungswinkel <i>angle of beam</i>	56°	56°	58°
Schutzart <i>protection class</i>	IP 67	IP 67	IP 67
Biegeradius <i>bending radius</i>	≥ 25 mm	≥ 40 mm	≥ 25 mm
Biegeradius Tastkopf <i>bending radius of probe</i>	–	–	–
Material Tastkopf <i>material sensor probe</i>	–	–	–
Material Gewindehülse <i>material thread sleeves</i>	Messing vernickelt <i>brass nickel plated</i>		
Material Faser <i>material fibre</i>	PMMA		
Material Ummantelung <i>material jacket</i>	PE		
Länge Lichtleiter <i>length fibre optic cable</i>	2000 mm		
Vorsatzoptik <i>auxiliary optic</i>	–	VO-2,5 / VO-2,5-90°	VO-2,5 / VO-2,5-90°

max. Reichweite *max. scanning range*

LKV-15...	550 mm	250 mm	300 mm
LKV-32...	400 mm	250 mm	200 mm
LKV-170...	1500 mm	900 mm	700 mm

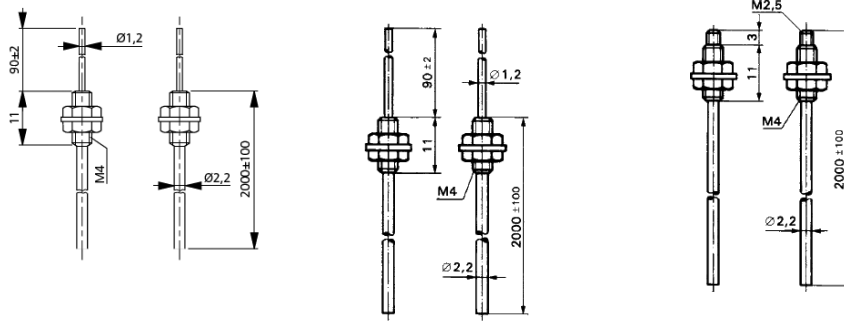
Type <i>type</i>	KLLKE 2000 KR-M6-1,0	KLLKE 2000 KH-M4-M2,5-1,0	KLLK 250 K-M4-M2,5-1,0
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Lichtleitkabelverstärker
fibre-optic-amplifiers

Lichtleiter KLLK ... fibre optics KLLK ...

Lichtleitkabel Ø 1 - Ø 2,2 mm plastic fibre-optic cable Ø 1 - Ø 2,2 mm

Funktion <i>function</i>	Einweg <i>through beam sensor</i>		
Lichtleiter <i>fibre optics</i>	Ø 2,2 mm		
Besonderheit <i>feature</i>	kleiner Biegeradius <i>small bending radius</i>	großer Schaltabstand <i>large scanning range</i>	Vorsatzoptik einsetzbar <i>auxiliary optic applicable</i>



Umgebungstemperatur <i>ambient temperature</i>	-25°C ... + 70°C	-25°C ... + 70°C	-35°C ... + 85°C
Lichtfaser <i>single fibre</i>	Ø 1 mm	Ø 1 mm	Ø 1 mm
Öffnungswinkel <i>angle of beam</i>	56°	58°	58°
Schutzart <i>protection class</i>	IP 67	IP 67	IP 67
Biegeradius <i>bending radius</i>	≥ 5 mm	≥ 22 mm	≥ 22 mm
Biegeradius Tastkopf <i>bending radius of probe</i>	≥ 25 mm	≥ 25 mm	—
Material Tastkopf <i>material sensor probe</i>	VA	VA	—
Material Gewindehülse <i>material thread sleeves</i>	Messing vernickelt <i>brass nickel plated</i>		
Material Faser <i>material fibre</i>	PMMA		
Material Ummantelung <i>material jacket</i>	PE		
Länge Lichtleiter <i>length fibre optic cable</i>	2000 mm		
Vorsatzoptik <i>auxiliary optic</i>	—	—	VO-2,5 / VO-2,5-90°

max. Reichweite *max. scanning range*

LKV-15...	150 mm	400 mm	200 mm
LKV-32...	100 mm	150 mm	160 mm
LKV-170...	500 mm	700 mm	700 mm

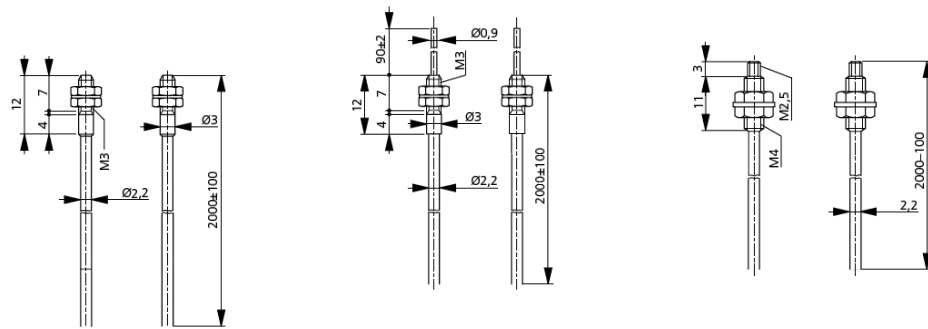
Type <i>type</i>	KLLKE 2000 KBF-M4-1,0	KLLK 250 KB-1,2-1,0	KLLK 250 K-M4-M2,5-1,0
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Lichtleitkabelverstärker
fibre-optic-amplifiers

Lichtleiter KLLK ... fibre optics KLLK ...

Lichtleitkabel Ø 1 - Ø 2,2 mm plastic fibre-optic cable Ø 1 - Ø 2,2 mm

Funktion <i>function</i>	Einweg <i>through beam sensor</i>		
Lichtleiter <i>fibre optics</i>	Ø 2,2 mm		
Besonderheit <i>feature</i>	max. Auflösung <i>max. resolution</i>	großer Schaltabstand <i>large scanning range</i>	kleiner Biegeradius <i>small bending radius</i>



Umgebungstemperatur <i>ambient temperature</i>	-25°C ... + 70°C		
Lichtfaser <i>single fibre</i>	Ø 0,5 mm	Ø 0,5 mm	Ø 1 mm
Öffnungswinkel <i>angle of beam</i>	56°		
Schutzart <i>protection class</i>	IP 67		
Biegeradius <i>bending radius</i>	≥ 25 mm	≥ 25 mm	≥ 5 mm
Biegeradius Tastkopf <i>bending radius of probe</i>	-	≥ 25 mm	-
Material Tastkopf <i>material sensor probe</i>	-	VA	-
Material Gewindehülse <i>material thread sleeves</i>	Messing vernickelt <i>brass nickel plated</i>		
Material Faser <i>material fibre</i>	PMMA		
Material Ummantelung <i>material jacket</i>	PE		
Länge Lichtleiter <i>length fibre optic cable</i>	2000 mm		
Vorsatzoptik <i>auxiliary optic</i>	-	-	VO-2,5 / VO-2,5-90°

max. Reichweite *max. scanning range*

LKV-15...	60 mm	45 mm	60 mm
LKV-32...	45 mm	25 mm	40 mm
LKV-170...	200 mm	150 mm	200 mm

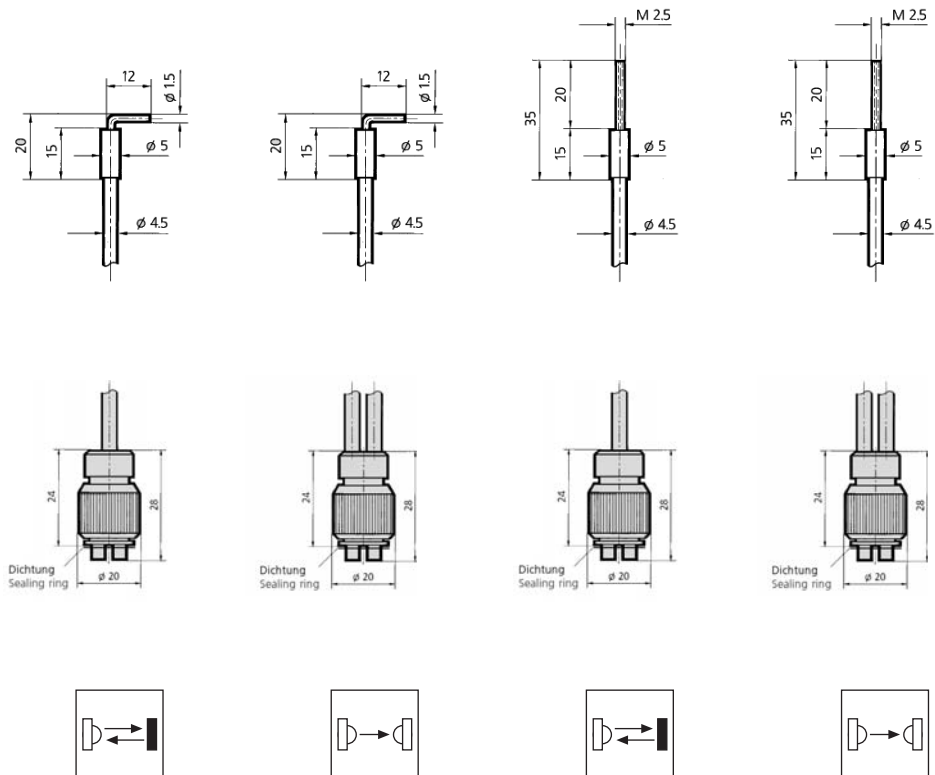
Type <i>type</i>	KLLKE 2000 K-M3-1,0	KLLKE 2000 KB-M3-0,5	KLLKE 2000 KF-M4-M2,5-1,0
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Lichtleitkabelverstärker
fibre-optic-amplifiers

Lichtleiter LLK ... fibre optics LLK ...

Lichtleitkabel Adaption M18 glass fibre-optic cable adaption M18

Funktion <i>function</i>	Taster <i>diffuse reflective sensor</i>	Einweg <i>through beam sensor</i>	Taster <i>diffuse reflective sensor</i>	Einweg <i>through beam sensor</i>
Lichtfaser <i>single fibre</i>	Ø 1,0 mm	Ø 1,0 mm	Ø 1,5 mm	Ø 1,5 mm



Reichweite <i>scanning range</i>	20 mm	150 mm	50 mm	200 mm
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Ummantelung / Länge *jacket / length*

Silikon / 300 mm	LLK-1030S-90-1,5-1,0	LLK-2030S-90-1,5-1,0	LLK-1030S-M2,5-1,5	LLK-2030S-M2,5-1,5
Silikon / 600 mm	LLK-1060S-90-1,5-1,0	LLK-2060S-90-1,5-1,0	LLK-1060S-M2,5-1,5	LLK-2060S-M2,5-1,5
Silikon / 1000 mm	LLK-1100S-90-1,5-1,0	LLK-2100S-90-1,5-1,0	LLK-1100S-M2,5-1,5	LLK-2100S-M2,5-1,5
Metall / 300 mm	LLK-1030M-90-1,5-1,0	LLK-2030M-90-1,5-1,0	LLK-1030M-M2,5-1,5	LLK-2030M-M2,5-1,5
Metall / 600 mm	LLK-1060M-90-1,5-1,0	LLK-2060M-90-1,5-1,0	LLK-1060M-M2,5-1,5	LLK-2060M-M2,5-1,5
Metall / 1000 mm	LLK-1100M-90-1,5-1,0	LLK-2100M-90-1,5-1,0	LLK-1100M-M2,5-1,5	LLK-2100M-M2,5-1,5
PU / 300 mm	-	-	-	-
PU / 300 mm	-	-	-	-
PU / 300 mm	-	-	-	-

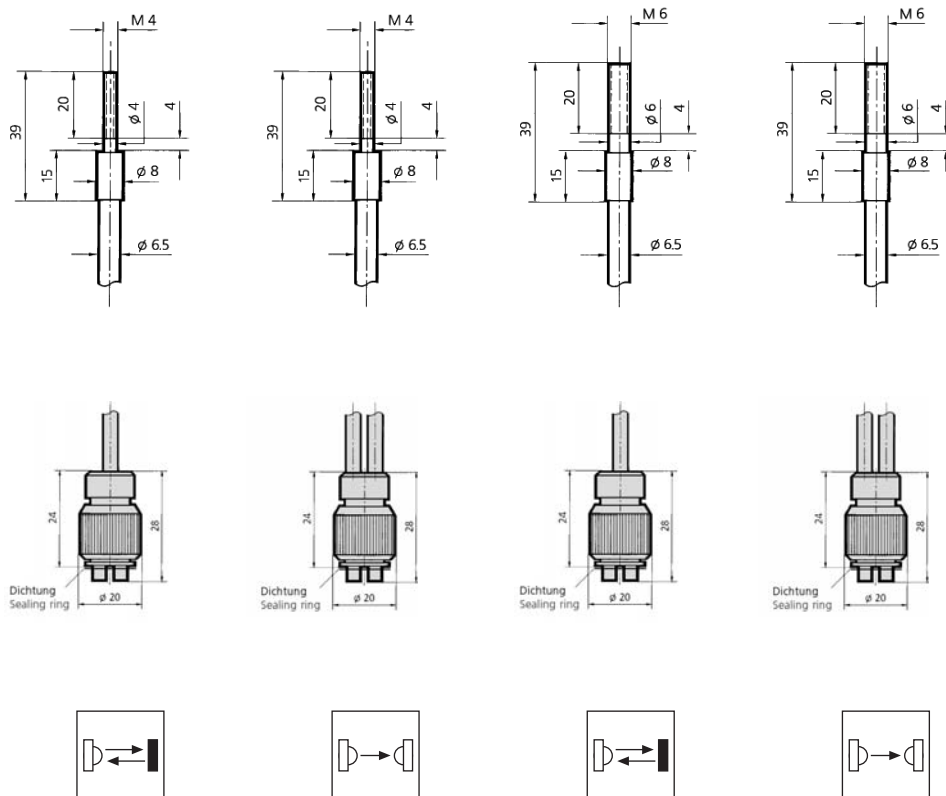
Sonderanfertigungen auf Anfrage. *Special sizes are available on request.*

Lichtleitkabelverstärker
fibre-optic amplifiers

Lichtleiter LLK ... fibre optics LLK ...

Lichtleitkabel Adaption M18 glas fibre-optic cable adaption M18

Funktion <i>function</i> Lichtfaser <i>single fibre</i>	Taster <i>diffuse reflective sensor</i> Ø 2,5 mm	Einweg <i>through beam sensor</i> Ø 2,5 mm	Taster <i>diffuse reflective sensor</i> Ø 2,5 mm	Einweg <i>through beam sensor</i> Ø 2,5 mm
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Reichweite <i>scanning range</i>	80 mm	800 mm	80 mm	800 mm
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Ummantelung / Länge *jacket / length*

Silikon / 300 mm	LLK-1030S-M4-2,5	LLK-2030S-M4-2,5	LLK-1030S-M6-2,5	LLK-2030S-M6-2,5
Silikon / 600 mm	LLK-1060S-M4-2,5	LLK-2060S-M4-2,5	LLK-1060S-M6-2,5	LLK-2060S-M6-2,5
Silikon / 1000 mm	LLK-1100S-M4-2,5	LLK-2100S-M4-2,5	LLK-1100S-M6-2,5	LLK-2100S-M6-2,5
Metall / 300 mm	LLK-1030M-M4-2,5	LLK-2030M-M4-2,5	LLK-1030M-M6-2,5	LLK-2030M-M6-2,5
Metall / 600 mm	LLK-1060M-M4-2,5	LLK-2060M-M4-2,5	LLK-1060M-M6-2,5	LLK-2060M-M6-2,5
Metall / 1000 mm	LLK-1100M-M4-2,5	LLK-2100M-M4-2,5	LLK-1100M-M6-2,5	LLK-2100M-M6-2,5
PU / 300 mm	-	-	-	-
PU / 300 mm	-	-	-	-
PU / 300 mm	-	-	-	-

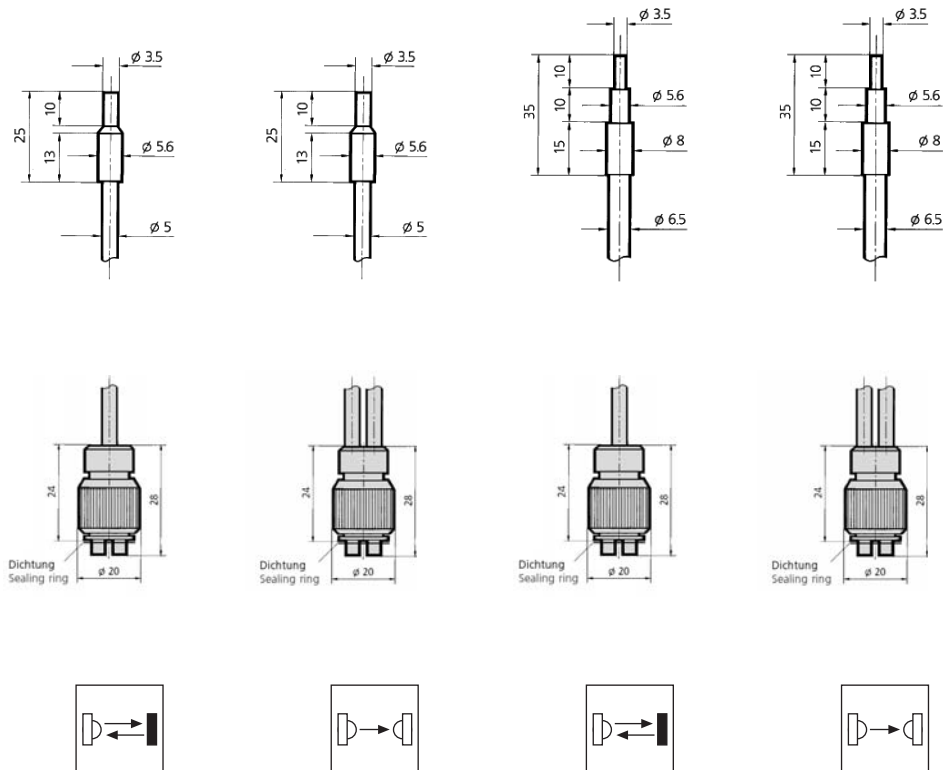
Sonderanfertigungen auf Anfrage. *Special sizes are available on request.*

Lichtleitkabelverstärker
fibre-optic-amplifiers

Lichtleiter LLK ... fibre optics LLK ...

Lichtleitkabel Adaption M18 glas fibre-optic cable adaption M18

Funktion <i>function</i> Lichtfaser <i>single fibre</i>	Taster <i>diffuse reflective sensor</i> Ø 2,5 mm	Einweg <i>through beam sensor</i> Ø 2,5 mm	Taster <i>diffuse reflective sensor</i> Ø 2,5 mm	Einweg <i>through beam sensor</i> Ø 2,5 mm
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Reichweite <i>scanning range</i>	80 mm	800 mm	80 mm	800 mm
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Ummantelung / Länge *jacket / length*

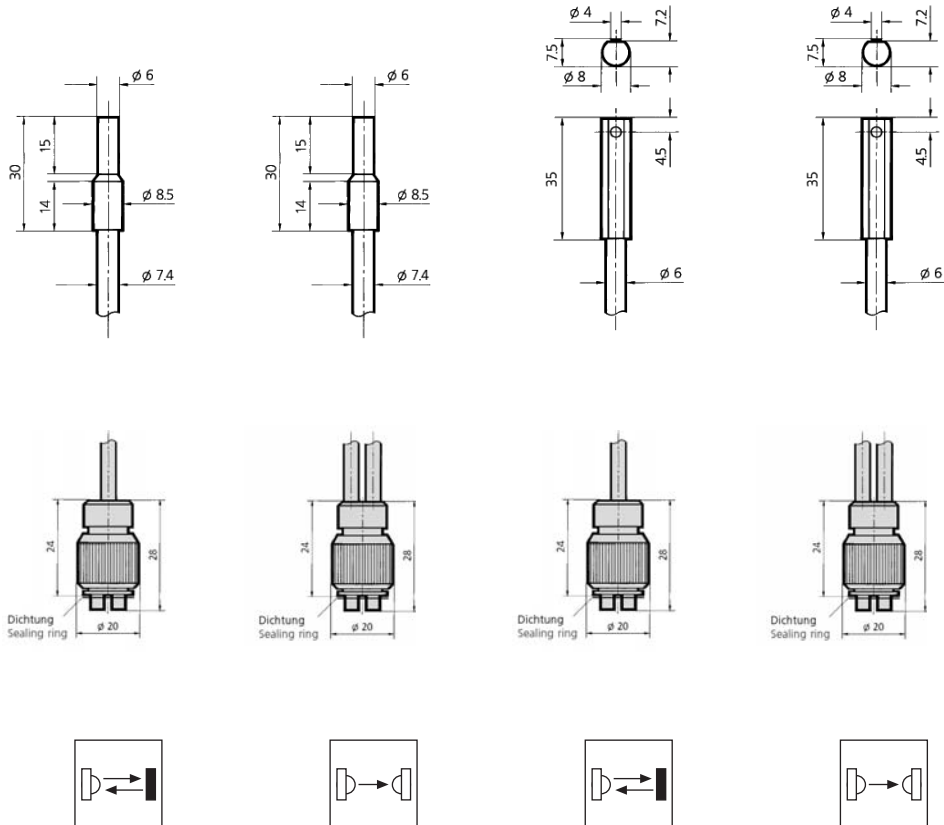
Silikon / 300 mm	LLK-1030S-5,6-2,5	LLK-2030S-5,6-2,5	LLK-1030S-8,0-2,5	LLK-2030S-8,0-2,5
Silikon / 600 mm	LLK-1060S-5,6-2,5	LLK-2060S-5,6-2,5	LLK-1060S-8,0-2,5	LLK-2060S-8,0-2,5
Silikon / 1000 mm	LLK-1100S-5,6-2,5	LLK-2100S-5,6-2,5	LLK-1100S-8,0-2,5	LLK-2100S-8,0-2,5
Metall / 300 mm	LLK-1030M-5,6-2,5	LLK-2030M-5,6-2,5	LLK-1030M-8,0-2,5	LLK-2030M-8,0-2,5
Metall / 600 mm	LLK-1060M-5,6-2,5	LLK-2060M-5,6-2,5	LLK-1060M-8,0-2,5	LLK-2060M-8,0-2,5
Metall / 1000 mm	LLK-1100M-5,6-2,5	LLK-2100M-5,6-2,5	LLK-1100M-8,0-2,5	LLK-2100M-8,0-2,5
PU / 300 mm	-	-	-	-
PU / 300 mm	-	-	-	-
PU / 300 mm	-	-	-	-

Sonderanfertigungen auf Anfrage. *Special sizes are available on request.*

Lichtleiter LLK ... fibre optics LLK ...

Lichtleitkabel Adaption M18 glas fibre-optic cable adaption M18

Funktion <i>function</i>	Taster <i>diffuse reflective sensor</i>	Einweg <i>through beam sensor</i>	Taster <i>diffuse reflective sensor</i>	Einweg <i>through beam sensor</i>
Lichtfaser <i>single fibre</i>	Ø 4,0 mm	Ø 4,0 mm	Ø 2,5 mm	Ø 2,5 mm



Reichweite <i>scanning range</i>	120 mm	1000 mm	70 mm	700 mm
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Ummantelung / Länge *jacket / length*

Silikon / 300 mm	LLK-1030S-8,5-4,0	LLK-2030S-8,5-4,0	LLK-1030SR-90-4,0-2,5	LLK-2030SR-90-4,0-2,5
Silikon / 600 mm	LLK-1060S-8,5-4,0	LLK-2060S-8,5-4,0	LLK-1060SR-90-4,0-2,5	LLK-2060SR-90-4,0-2,5
Silikon / 1000 mm	LLK-1100S-8,5-4,0	LLK-2100S-8,5-4,0	LLK-1100SR-90-4,0-2,5	LLK-2100SR-90-4,0-2,5
Metall / 300 mm	LLK-1030M-8,5-4,0	LLK-2030M-8,5-4,0	LLK-1030MR-90-4,0-2,5	LLK-2030MR-90-4,0-2,5
Metall / 600 mm	LLK-1060M-8,5-4,0	LLK-2060M-8,5-4,0	LLK-1060MR-90-4,0-2,5	LLK-2060MR-90-4,0-2,5
Metall / 1000 mm	LLK-1100M-8,5-4,0	LLK-2100M-8,5-4,0	LLK-1100MR-90-4,0-2,5	LLK-2100MR-90-4,0-2,5
PU / 300 mm	-	-	-	-
PU / 300 mm	-	-	-	-
PU / 300 mm	-	-	-	-

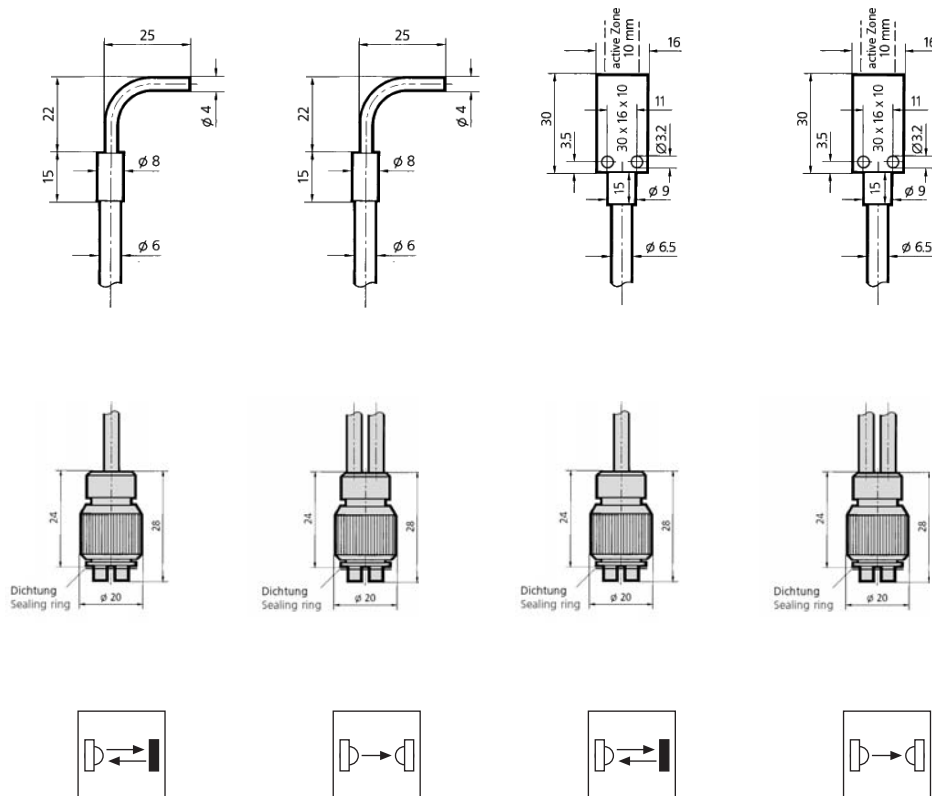
Sonderanfertigungen auf Anfrage. *Special sizes are available on request.*

Lichtleitkabelverstärker
fibre-optic-amplifiers

Lichtleiter LLK ... fibre optics LLK ...

Lichtleitkabel Adaption M18 glas fibre-optic cable adaption M18

Funktion <i>function</i> Lichtfaser <i>single fibre</i>	Taster <i>diffuse reflective sensor</i> Ø 2,5 mm	Einweg <i>through beam sensor</i> Ø 2,5 mm	Taster <i>diffuse reflective sensor</i> 10 x 0,6 mm	Einweg <i>through beam sensor</i> 10 x 0,3 mm
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Reichweite <i>scanning range</i>	100 mm	1600 mm	120 mm	1200 mm
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Ummantelung / Länge *jacket / length*

Silikon / 300 mm	LLK-1030S-90-4,0-2,5	LLK-2030S-90-4,0-2,5	LLK-1030SQ-10-0,6	LLK-2030SQ-10-0,3
Silikon / 600 mm	LLK-1060S-90-4,0-2,5	LLK-2060S-90-4,0-2,5	LLK-1060SQ-10-0,6	LLK-2060SQ-10-0,3
Silikon / 1000 mm	LLK-1100S-90-4,0-2,5	LLK-2100S-90-4,0-2,5	LLK-1100SQ-10-0,6	LLK-2100SQ-10-0,3
Metall / 300 mm	LLK-1030M-90-4,0-2,5	LLK-2030M-90-4,0-2,5	LLK-1030MQ-10-0,6	LLK-2030MQ-10-0,3
Metall / 600 mm	LLK-1060M-90-4,0-2,5	LLK-2060M-90-4,0-2,5	LLK-1060MQ-10-0,6	LLK-2060MQ-10-0,3
Metall / 1000 mm	LLK-1100M-90-4,0-2,5	LLK-2100M-90-4,0-2,5	LLK-1100MQ-10-0,6	LLK-2100MQ-10-0,3
PU / 300 mm	-	-	-	-
PU / 300 mm	-	-	-	-
PU / 300 mm	-	-	-	-

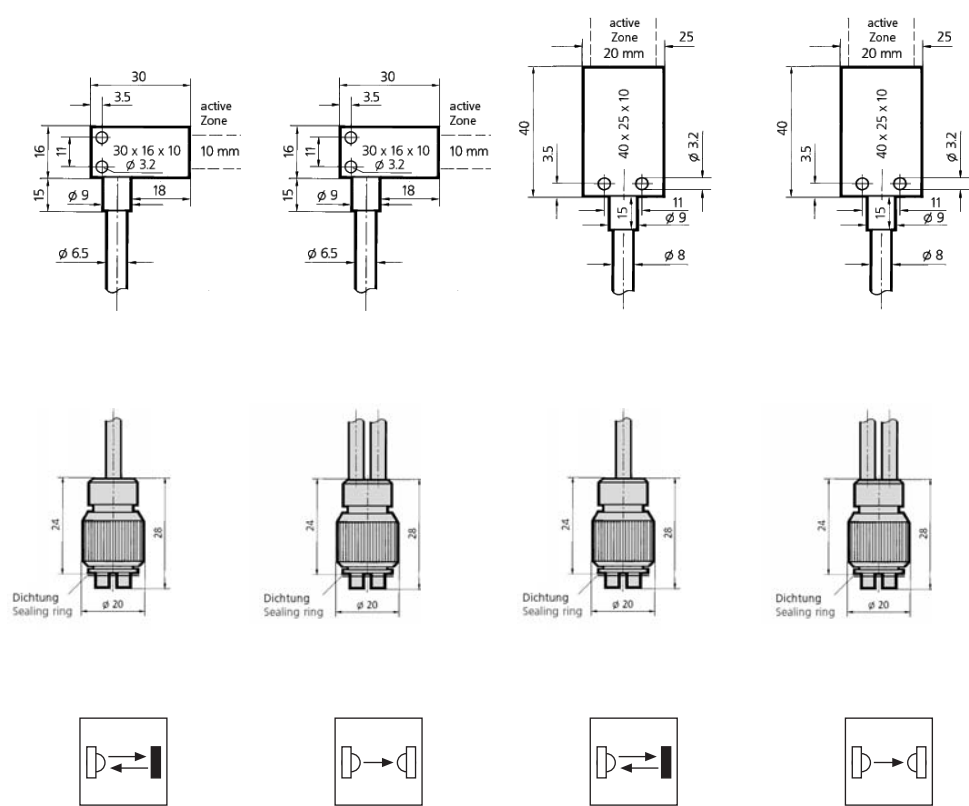
Sonderanfertigungen auf Anfrage. *Special sizes are available on request.*

Lichtleitkabelverstärker
fibre-optic-amplifiers

Lichtleiter LLK ... fibre optics LLK ...

Lichtleitkabel Adaption M18 glas fibre-optic cable adaption M18

Funktion <i>function</i>	Taster <i>diffuse reflective sensor</i>	Einweg <i>through beam sensor</i>	Taster <i>diffuse reflective sensor</i>	Einweg <i>through beam sensor</i>
Lichtfaser <i>single fibre</i>	10 x 0,6 mm	10 x 0,3 mm	20 x 0,6 mm	20 x 0,3 mm



Reichweite <i>scanning range</i>	120 mm	1200 mm	130 mm	1600 mm
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Ummantelung / Länge *jacket / length*

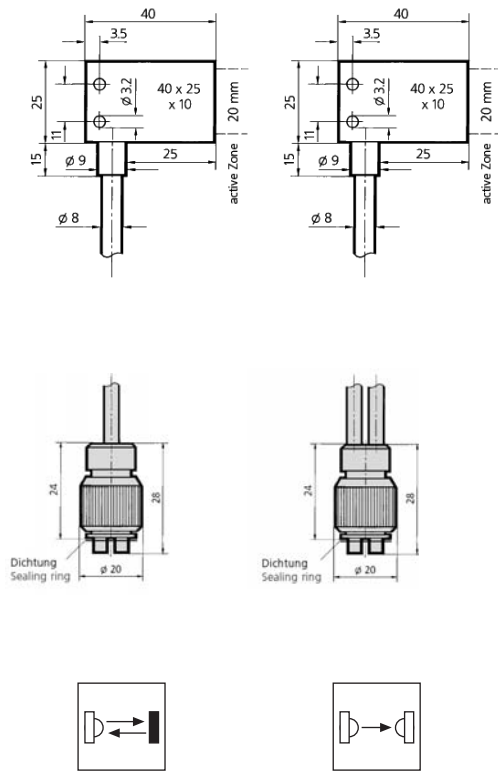
Silikon / 300 mm	LLK-1030SQ-90-10-0,6	LLK-2030SQ-90-10-0,3	LLK-1030SQ-20-0,6	LLK-2030SQ-20-0,3
Silikon / 600 mm	LLK-1060SQ-90-10-0,6	LLK-2060SQ-90-10-0,3	LLK-1060SQ-20-0,6	LLK-2060SQ-20-0,3
Silikon / 1000 mm	LLK-1100SQ-90-10-0,6	LLK-2100SQ-90-10-0,3	LLK-1100SQ-20-0,6	LLK-2100SQ-20-0,3
Metall / 300 mm	LLK-1030MQ-90-10-0,6	LLK-2030MQ-90-10-0,3	LLK-1030MQ-20-0,6	LLK-2030MQ-20-0,3
Metall / 600 mm	LLK-1060MQ-90-10-0,6	LLK-2060MQ-90-10-0,3	LLK-1060MQ-20-0,6	LLK-2060MQ-20-0,3
Metall / 1000 mm	LLK-1100MQ-90-10-0,6	LLK-2100MQ-90-10-0,3	LLK-1100MQ-20-0,6	LLK-2100MQ-20-0,3
PU / 300 mm	-	-	-	-
PU / 300 mm	-	-	-	-
PU / 300 mm	-	-	-	-

Sonderanfertigungen auf Anfrage. *Special sizes are available on request.*

Lichtleiter LLK ... fibre optics LLK ...

Lichtleitkabel Adaption M18 glas fibre-optic cable adaption M18

Funktion <i>function</i>	Taster <i>diffuse reflective sensor</i>	Einweg <i>through beam sensor</i>
Lichtfaser <i>single fibre</i>	20 x 0,6 mm	20 x 0,3 mm



Reichweite <i>scanning range</i>	130 mm	1600 mm
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Ummantelung / Länge *jacket / length*

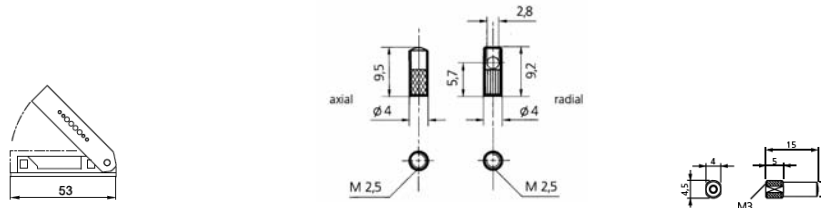
Silikon / 300 mm	LLK-1030SQ-90-20-0,6	LLK-2030SQ-90-20-0,3
Silikon / 600 mm	LLK-1060SQ-90-20-0,6	LLK-2060SQ-90-20-0,3
Silikon / 1000 mm	LLK-1100SQ-90-20-0,6	LLK-2100SQ-90-20-0,3
Metall / 300 mm	LLK-1030MQ-90-20-0,6	LLK-2030MQ-90-20-0,3
Metall / 600 mm	LLK-1060MQ-90-20-0,6	LLK-2060MQ-90-20-0,3
Metall / 1000 mm	LLK-1100MQ-90-20-0,6	LLK-2100MQ-90-20-0,3
PU / 300 mm	-	-
PU / 300 mm	-	-
PU / 300 mm	-	-

Sonderanfertigungen auf Anfrage. *Special sizes are available on request.*

Lichtleitkabelverstärker
fibre-optic-amplifiers

Zubehör Lichtleiter *accessory fibre optics*

Beschreibung *description* | Schneidmesser *cutting tool* | Vorsatzoptik M2,5 *auxiliary optic M2,5* | Fokuso­ptik M3 *focusing optic M3*



Funktion <i>function</i>	Schneiden von KLLK-1 <i>to cut KLLK-1</i>	VOM-2,5 = Reichweitenerhöhung <i>= scanning range increase</i>	Fokussierung für KLLK <i>focusing for KLLK</i>
		VOM-2,5-90 = seitlicher Lichtaustritt <i>= lateral light emission</i>	
Type <i>type</i>	SM-1	VOM-2,5 VOM-2,5-90	VOM-M3

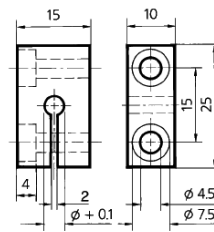
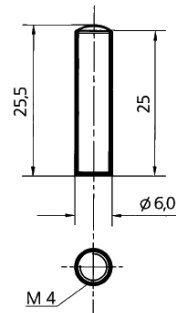
Lichtleitkabelverstärker
fibre-optic-amplifiers

Zubehör Lichtleiter *accessory fibre optics*

Beschreibung *description*

Vorsatzoptik M4 für LLK... *auxiliary optic M4 for LLK...*

Klemmblock für LLK... *mounting for LLK...*



Funktion *function*

seitlicher Lichtaustritt für LLK 2... *lateral light emission for LLK 2...*

Befestigung von LLK ... *to fix LLK ...*

Type *type*

VO-M4

KB-3,5 (3,5mm)

KB-5 (5,0mm)

KB-5,6 (5,6mm)

KB-6,5 (6,5mm)

KB-8 (8,0mm)

KB-8,5 (8,5mm)