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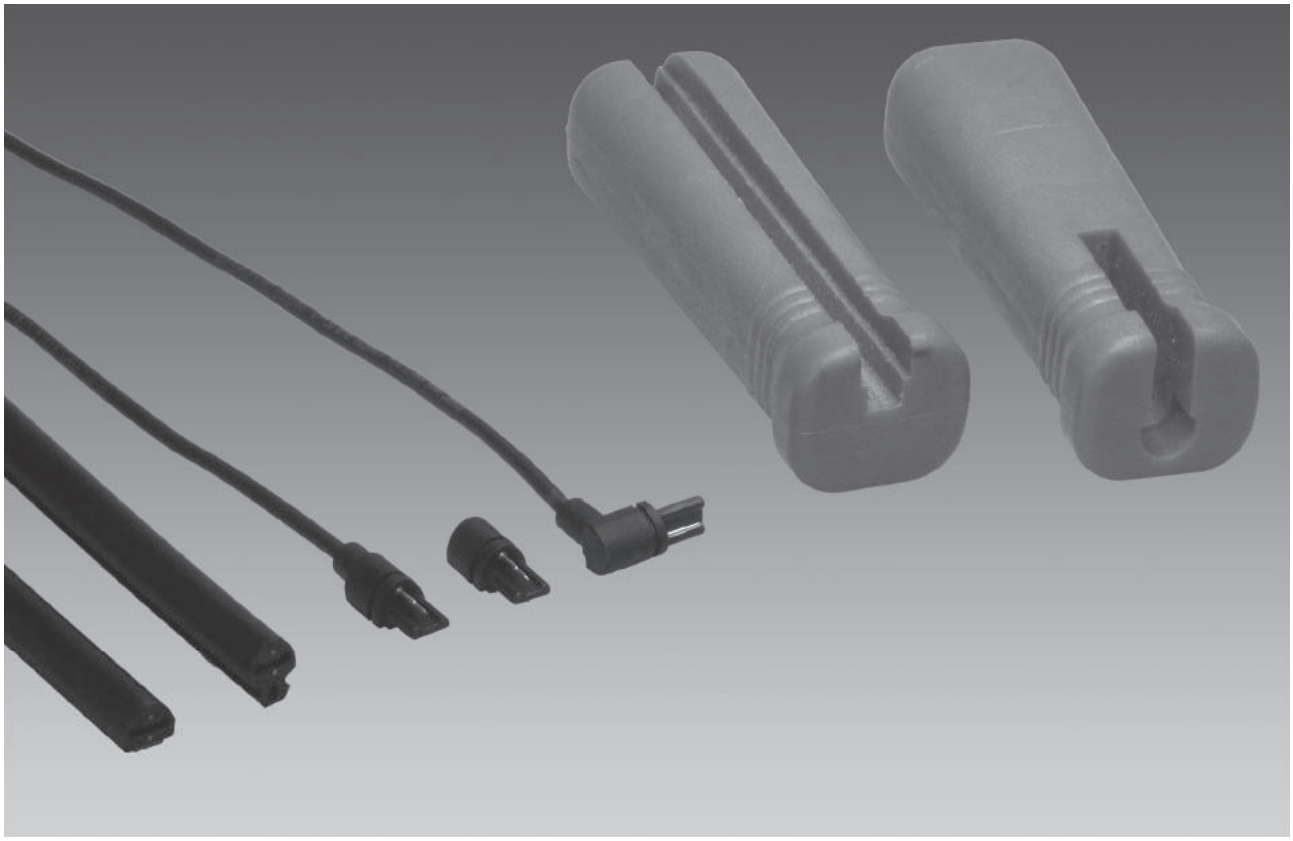
Product Information



DIY Miniature Safety Edges

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Contents

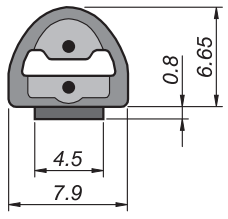
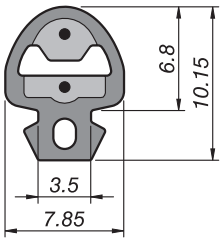
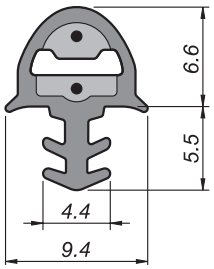
250412 v1.1

Materials list

Part no.	Designation	Pack. unit
7502395	Contact tube EKS 011, self-adhesive	50 m
7502394	Contact tube EKS 014, with clip foot	50 m
7502773	Contact tube EKS 052, with clamp foot	50 m
1004580	End piece with resistor 1k2	50 pcs.
1004747	End piece with resistor 2k2	50 pcs.
1004579	End piece with TPU cable 2.5 m, axial	50 pcs.
1004581	End piece with TPU cable 2.5 m, angled 90°	50 pcs.
1003436	Aluminium profile C 10 for EKS 014 with clip foot	6 m
1004988	Scissors with stop	1 pc.
7502412	Assembly aid set	1 pc.
1004987	Special adhesive Contact VA 250 Black, 12 g, for IP64	1 pc.
7501995	Primer 4297 type 3M, 125 ml, in can	1 pc.

Contact tubes

Dimensions

EKS 011 TPE	EKS 014 TPE	EKS 052 TPE
		
Actuating force: < 50 N actuating distance at 50 mm/s < 2 mm	Actuating force: < 50 N actuating distance at 50 mm/s < 2 mm	Actuating force: < 50 N actuating distance at 50 mm/s < 2 mm

Notes: Dimensional tolerances as per ISO 3302 E2/L2.

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Subject to technical modifications.

Physical resistance

Miniature Safety Edge EKS	TPE
IEC 60529: Degree of protection	IP40
Hardness as per Shore A	50 ±5

Notes:
Higher degrees of protection up to IP64 are possible using special adhesive (part no. 1004987).

Chemical resistance

Miniature Safety Edge EKS	TPE
Acetone	-
Formic acid	-
Armor All	+
Car shampoo	+
Petrol	-
Brake fluid	+
Buraton	+
Butanol	-
Sodium hypochlorite	-
disinfectant	+
Diesel	-
Acetic acid 10 %	-
Ethanol	+
Ethyl acetate	-
Ethylene glycol	+
Greases	±
Anti-frost agent	+
Skin cream	+
Icidine	+
Incidine	+
Incidine plus	+
Cooling lubricant	-
Plastic cleaner	+
Lyso FD 10	+
Metal working oil	-
Microbac	+
Microbac forte	+
Minutil	+
Saline solution 5 %	+
White spirit (ethyl alcohol)	+
Terralin	+
UV-resistance	+
Centring oil	-

Explanation of symbols:
+ = resistant
± = limited resistance
- = not resistant

Notes:
Tests are carried out at room temperature (+23 °C).

Subject to technical modifications.

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The Safety Element is resistant against normal chemical influences such as diluted acids and alkalis as well as alcohol over an exposure period of 24 hrs.

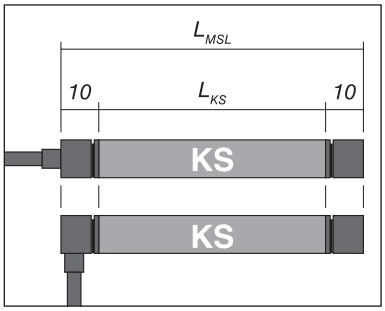
The values in the table are results of tests carried out in our laboratory to the best of our knowledge and belief. The suitability of our products for your special area of application must always be verified with your own practical tests.

DIY in 3 steps

These instructions describe cutting the contact tube to the required length, application of the end pieces and final testing. The end product is a Miniature Safety Edge EKS 011, EKS 014 or EKS 052 with degree of protection IP40.

1. Cutting to length

- Measure contact tube (KS) to length and mark.
  The following applies: $L_{KS} = L_{MSL} - 20$ mm
  where:
  L_{KS} = length of contact tube
  L_{MSL} = length of Miniature Safety Edge



- Place contact tube against stop of the scissors and cut off at marking

2. Insertion

- Insert contact tube in assembly aid SH1 so that the contact tube protrudes 2 to 3 mm beyond the edge.

- Insert cable end piece in assembly aid SH2.

Tip
For a better bond between the end piece and the end of the contact tube, brush with a thin layer of special adhesive (part no. 1004987).

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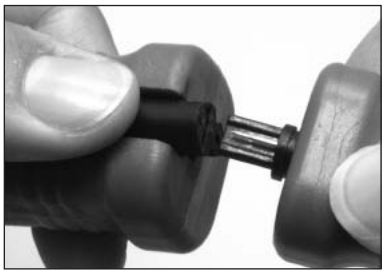

- Fix contact tube in assembly aid SH1 by pressing firmly with thumb.
- Insert end piece straight into contact tube with assembly aid SH2 and press firmly against assembly aid SH1 until the air gap between the end piece and the contact tube disappears.

- Loosely detach assembly aid SH2 and remove semi-finished Miniature Safety Edge.

Tip
Use leverage effect – with slight pressure on contact tube at the end of the handle.

- Assemble the other end of the contact tube with a resistor end piece in the same way.

3. Check

- Visual check for flush connection of the end pieces all round.
- Check operation with multimeter: Are set values met?

Set values:

Miniature Safety Edge not activated

EKS/W with 1k2:	1.2 kOhm ±5%
EKS/W with 2k2:	2.2 kOhm ±5%
EKS/BK:	> 20 MOhm
Continuity test per channel:	< (5 + (L_{KS} × 0.5/m)) Ohm

Miniature Safety Edge activated

all EKS:	< 400 Ohm

Miniature Safety Edge may be irreparably damaged!

➔ No tensile load may be applied to the cable.

➔ Do not pull Miniature Safety Edge into an outer profile.

➔ Clip EKS 014 into aluminium profile C 10, do not pull in.

➔ No pressure may be exerted on the contact tube in non-operative mode.

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Subject to technical modifications.

Fixing possibilities

EKS 011 using acrylic-foam adhesive tape

Requirements

For ideal bonding, the bonding surface must be

+ clean
+ dry
+ smooth.

Avoid

- very uneven
- sharp-edged bonding surfaces.

Note:
Check with adhesion tests before serial use whether bonding is possible on the selected installation surface.

Bonded to	with primer	without primer
ABS	+	-
Aluminium	+	+
Aluminium: anodised	+	-
CAB	-	-
HDPE	-	-
Wood: untreated	-	-
Wood: glazed, veneered or plastic coated	+	-
PA6	+	-
PA66	+	+
PE	-	-
PMMA	+	+
PP	+	-
PS	-	-
PVC	+	+
SAN	+	-
Steel, stainless steel	+	+

Explanation of symbols:
+ = OK
- = not OK

Note:
Tests carried out at 23 °C (room temperature).

Bonding

1. Clean and degrease bonding surface.
2. Apply primer to complete bonding surface with brush.
3. Air dry primer for approx.10 minutes.
4. Remove 10 to 15 cm of liner from acrylic foam.
5. Place on bonding surface and press on firmly.
6. Repeat items 4. and 5. until EKS is completely bonded.
7. Maximum adhesion is achieved after 24 hrs.

Note:
Ideal results are achieved with primer 4297 type 3M (part no. 7501995).

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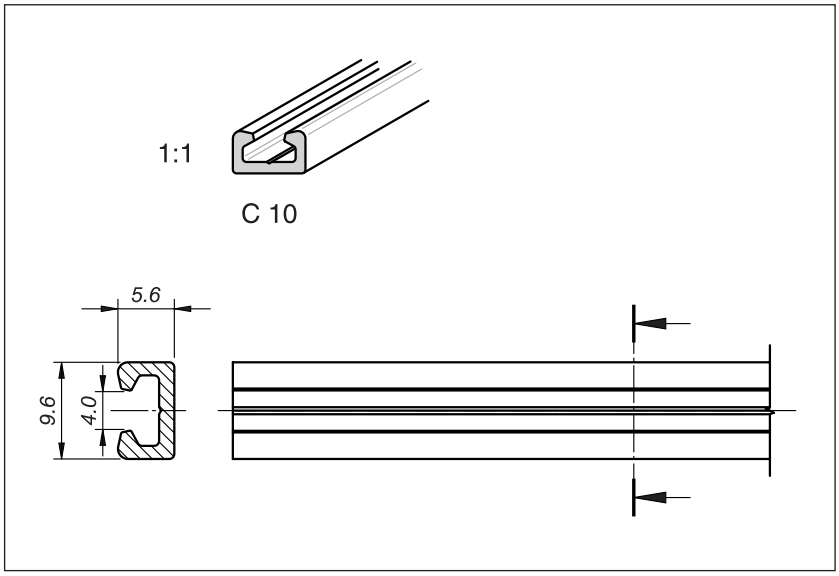
EKS 014 with clip foot

The Miniature Safety Edge is clipped into aluminium profile C 10.



Material properties

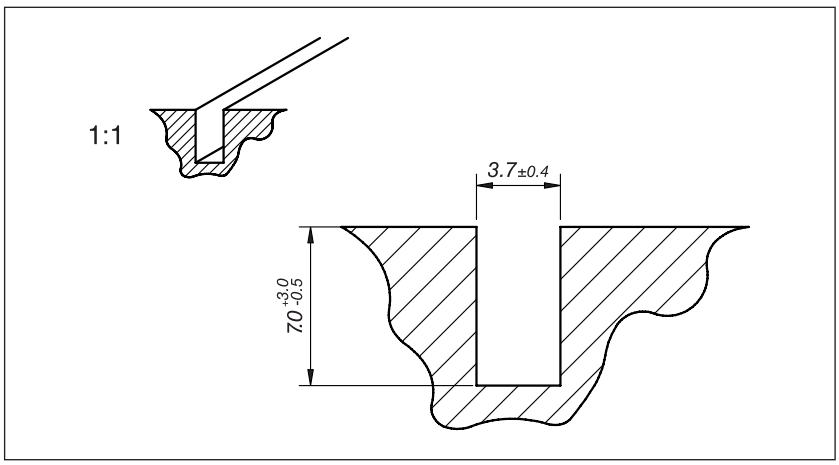
- AlMgSi0.5 F22
- Wall thickness min. 1.3 mm
- Tolerances as per EN 755-9
- extruded
- hot hardened

Assembly

- Fix aluminium profile C 10 with countersunk screws M2×2.5.
- Clip Miniature Safety Edge into aluminium profile C 10.

EKS 052 with clamp foot

The Miniature Safety Edge is pressed into a groove.



Assembly

- Press foot into the groove until the Miniature Safety Edge is evenly inserted.

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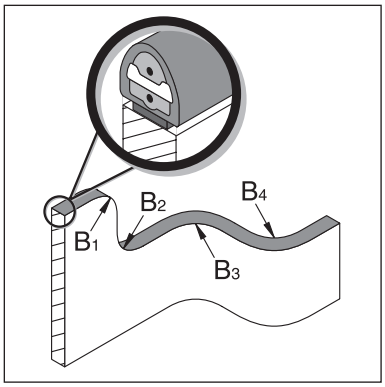
Technical data DIY EKS 011

Miniature Safety Edge EKS 011
manufactured with resistor for 2-wire technology
or without resistor for 4-wire technology.

Switching characteristics at v_{test} = 50 mm/s		
Switching operations	> 1× 10^5	
Actuating force	**+23 °C**	**-25 °C**
Test piece (rod) Ø 4 mm	< 15 N	< 30 N
Test piece (rod) Ø 200 mm	< 25 N	< 50 N
Actuating distance		
Test piece (cylinder) Ø 80 mm	< 2.0 mm	
Actuation angle		
Test piece (cylinder) Ø 80 mm	< 80°	
Safety classifications		
ISO 13849-1: B_{10d}	2× 10^6	
Mechanical operating conditions		
Acrylic foam		
Peel force	15 N/cm	
Bend radii, minimum		
B_1 / B_2 / B_3 / B_4	120 / 150 / 20 / 20 mm	
Tensile load, cable (max.)	20 N	
IEC 60529: Degree of protection	IP40	
Operating temperature	-25 to +80 °C	
temporary	-40 to +100 °C	
Behaviour in fire		
as per DIN 75200	approx. 40 mm/min	
Electrical operating conditions		
Terminal resistance 1k2/2k2	± 5%/± 5%	
Switching capacity (max.)	250 mW	
Contact transition resistance	< 400 Ohm (per sensor)	
More than one sensor	5 in series max.	
Electrical rating		
Voltage (max.)	DC 24 V	
Current (min./max.)	1 mA / 10 mA	
Connection cable	Ø 2.7 mm TPU 2× 0.25 mm^2	
Chemical resistance (see page 4)		
	The sensor is resistant against normal chemical influences over a period of exposure of 24 hrs (see p. 4).	
Dimensional tolerances		
Length as per	ISO 3302 L2	
Profile section as per	ISO 3302 E2	

Bend radii:



Note:
Higher degrees of protection up to IP64 and a tensile load on the cable of up to 60 N are possible using special adhesive (part no. 1004987).

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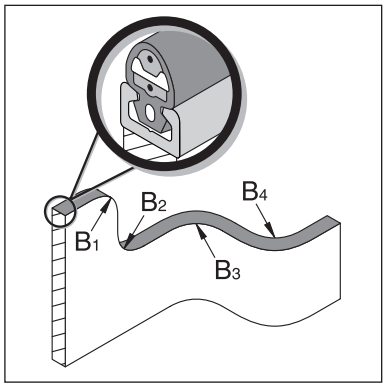
Technical data DIY EKS 014

Miniature Safety Edge EKS 014
manufactured with resistor for 2-wire technology
or without resistor for 4-wire technology

Switching characteristics at v_{test} = 50 mm/s		
Switching operations	> 1× 10^5	
Actuating force	**+23 °C**	**-25 °C**
Test piece (rod) Ø 4 mm	< 15 N	< 30 N
Test piece (rod) Ø 200 mm	< 25 N	< 50 N
Actuating distance		
Test piece (cylinder) Ø 80 mm	< 2.0 mm	
Actuation angle		
Test piece (cylinder) Ø 80 mm	< 80°	
Safety classifications		
ISO 13849-1: B_{10d}	2× 10^6	
Mechanical operating conditions		
Clip foot width	3.5 mm	
Aluminium profile (recommended)	C 10	
Bend radii, minimum		
B_1 / B_2 / B_3 / B_4	120 / 150 / 20 / 20 mm	
Tensile load, cable (max.)	20 N	
IEC 60529: Degree of protection	IP40	
Operating temperature	-25 to +80 °C	
temporary	-40 to +100 °C	
Behaviour in fire		
as per DIN 75200	approx. 40 mm/min	
Electrical operating conditions		
Terminal resistance 1k2/2k2	± 5%/± 5%	
Switching capacity (max.)	250 mW	
Contact transition resistance	< 400 Ohm (per sensor)	
More than one sensor	5 in series max.	
Electrical rating		
Voltage (max.)	DC 24 V	
Current (min./max.)	1 mA / 10 mA	
Connection cable	Ø 2.7 mm TPU 2× 0.25 mm^2	
Chemical resistance (see page 4)		
	The sensor is resistant against normal chemical influences over a period of exposure of 24 hrs (see p. 4).	
Dimensional tolerances		
Length as per	ISO 3302 L2	
Profile section as per	ISO 3302 E2	

Bend radii:



Note:
Higher degrees of protection up to IP64 and a tensile load on the cable of up to 60 N are possible using special adhesive (part no. 1004987).

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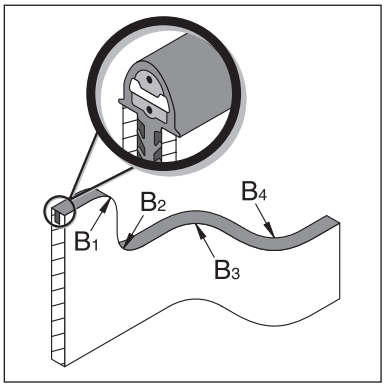
Technical data DIY EKS 052

Miniature Safety Edge EKS 052
manufactured with resistor for 2-wire technology
or without resistor for 4-wire technology

Switching characteristics at $v_{Prüf}$ = 50 mm/s		
Switching operations	> 1× 10^5	
Actuating force	**+23 °C**	**-25 °C**
Test piece (rod) Ø 4 mm	< 15 N	< 30 N
Test piece (rod) Ø 200 mm	< 25 N	< 50 N
Actuating distance		
Test piece (cylinder) Ø 80 mm	< 2.0 mm	
Actuation angle		
Test piece (cylinder) Ø 80 mm	< 80°	
Safety classifications		
ISO 13849-1: B_{10d}	2× 10^6	
Mechanical operating conditions		
Groove width for clamp foot	3.7 ±0.4 mm	
Bend radii, minimum		
B_1 / B_2 / B_3 / B_4	120 / 150 / 20 / 20 mm	
Tensile load, cable (max.)	20 N	
IEC 60529: Degree of protection	IP40	
Operating temperature	-25 to +80 °C	
temporary	-40 to +100 °C	
Behaviour in fire		
as per DIN 75200	approx. 40 mm/min	
Electrical operating conditions		
Terminal resistance 1k2/2k2	±5% / ±5%	
Switching capacity (max.)	250 mW	
Contact transition resistance	< 400 Ohm (per sensor)	
More than one sensor	5 in series max.	
Electrical rating		
Voltage (max.)	DC 24 V	
Current (min./max.)	1 mA / 10 mA	
Connection cable	Ø 2.7 mm TPU 2× 0.25 mm^2	
Chemical resistance (see page 4)		
	The sensor is resistant against normal chemical influences over a period of exposure of 24 hrs (see p. 4).	
Dimensional tolerances		
Length as per	ISO 3302 L2	
Profile section as per	ISO 3302 E2	

Bend radii:



Note:
Higher degrees of protection up to IP64 and a tensile load on the cable of up to 60 N are possible using special adhesive (part no. 1004987).

250412 v1.1

Subject to technical modifications.