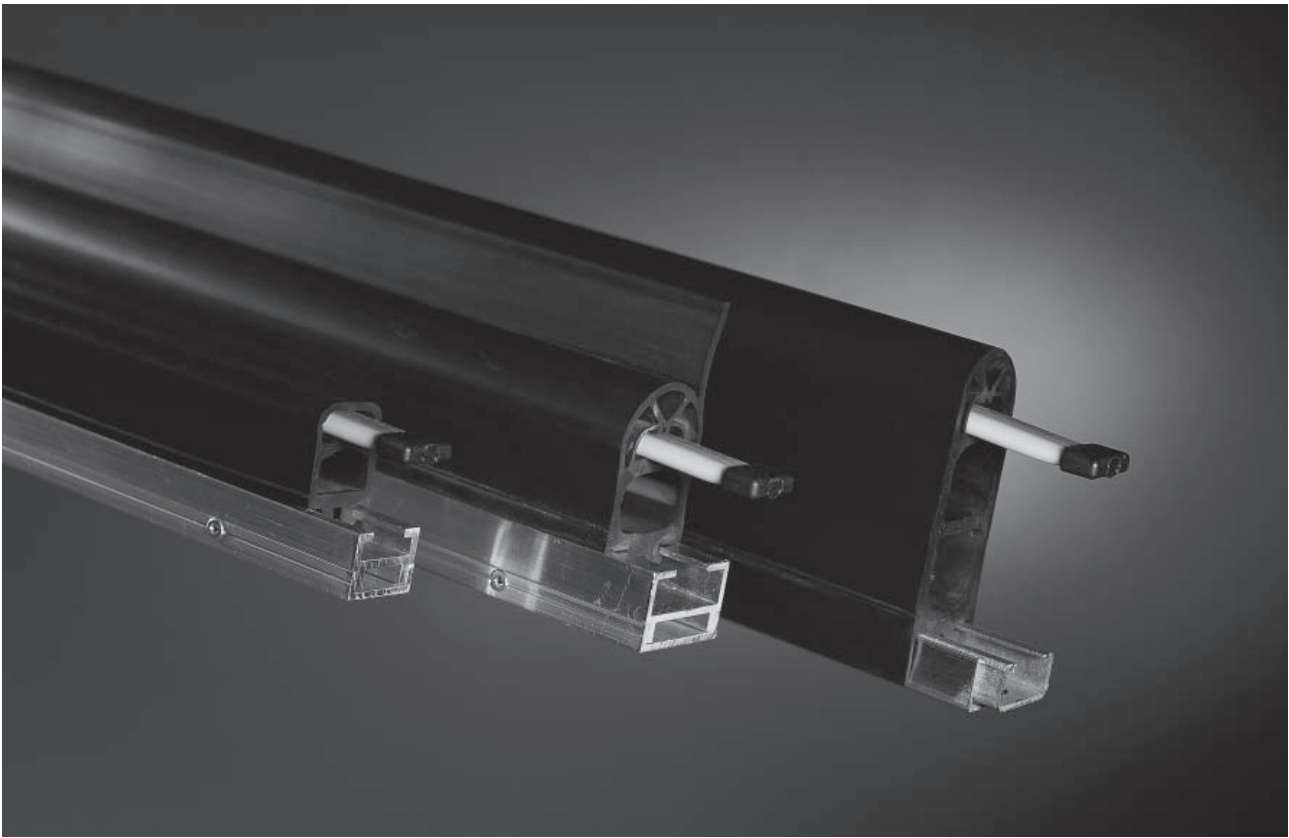




## Product Information



## Safety Edges SL/W and SL/BK

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### Important information

Read through the product information carefully. It contains important information on operation, safety and maintenance of the normally open Safety Edge. Retain the product information for later reference.

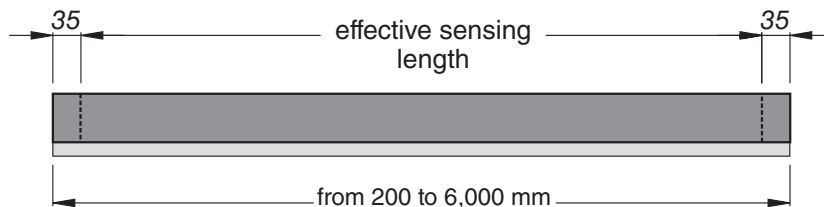
Always observe the safety instructions on the following pages under **ATTENTION**. Only use the normally open Safety Edge for the purpose described in the product information.

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## Available lengths

The contact elements can be supplied in lengths between 200 and 6,000 mm.

In the case of the standard Safety Edge both ends have a non-sensitive area 35 mm long



## Calculation for selection of the Safety Edge height

The stopping distance of the dangerous movement is calculated using the following formula:

$$s_1 = 1/2 \times v \times T \quad \text{where:}$$

$$T = t_1 + t_2$$

In accordance with EN 1760-2, the minimum overtravel distance of the Safety Edge is calculated using the following formula:

$$s = s_1 \times C \quad \text{where:}$$

$$C = 1.2$$

Overtravel distances: see 3.5

Mit dem Ergebnis kann nun ein geeignetes Schaltleistenprofil ausgewählt werden.

- $s_1$  = Stopping distance of the dangerous movement [ mm ]
- $v$  = Velocity of the dangerous movement [ mm/s ]
- $T$  = Follow-through of the complete system [ s ]
- $t_1$  = Response time Safety Edge
- $t_2$  = Stopping time of the machine
- $s$  = Minimum overtravel distance of the Safety Edge so that the pinching force does not exceed a limit value [ mm ]
- $C$  = Safety factor; if components susceptible to failures (braking system) exist in the system, a higher factor must be selected.

## Cable connection

### Standard

- Cables:  $\varnothing$  3.7 mm TPE, 2x 0.22 mm<sup>2</sup>  
Wire colours: red, black
- Cable length: 2 m / 5 m / 10 m
- Cable ends without plug and coupling  
Option: Kabelenden mit Stecker bzw. Kupplung lieferbar

### ATTENTION

Max. cable length to signal processing unit: 200 m

*Subject to technical modifications.*

## Chemical resistance

<b>Rubber profile GP</b> Identification rills on side of profile	<b>EPDM</b> v	<b>NBR</b> vv	<b>CR</b> vvv
<b>Material Rating</b>			
Hardness as per Shore A	55 ±5	60 ±5	60 ±5
Application area Machines		x	x
Application area Doors+Gates	x		
<b>Chemical resistance</b>			
Acetone	+	±	+
Formic acid	+	+	+
Ammonia	+	+	+
Petrol	-	+	±
Brake fluid	±	±	±
Chloride solutions	+	+	+
Diesel oils	-	+	+
Greases	-	+	+
Isopropyl alcoho	+	+	+
Cooling lubricant	-	+	+
Metal working oil	-	+	+
Methyl alcohol	+	+	±
Oils	-	+	+
Ozone and weather conditions	+	-	+
Hydrochloric acid 10 %	+	+	+
Spirit (ethyl alcohol)	+	+	+
Carbon tetrachloride	-	+	-
Water and frost	+	-	±
Hydrogen peroxide 10 %	+	+	-
Household/sanitary cleaners	+	+	+

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

Explanation of symbols:

- + = resistant
- ± = limited resistance
- = not resistant

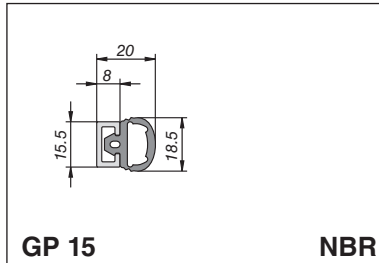
The values in the table are results of tests carried out in our laboratory to the best of our knowledge and belief. The suitability of our products for your special area of application must always be verified with your own practical tests.

*Subject to technical modifications.*

## Rubber profiles and operating distances

Actuation force: < 150 N (bei 23 °C und Prüfkörper Ø 80 mm)

Dimensional tolerances: ISO 3302 E2/L2

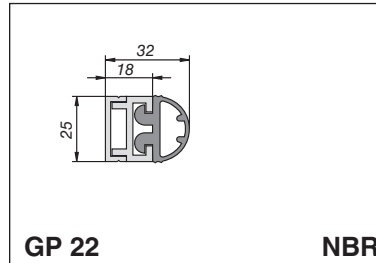


**GP 15** **NBR**

Actuation distance:  
at 10 mm/s 2 - 4 mm

Overtravel distance: -

Al - profile range: C 15

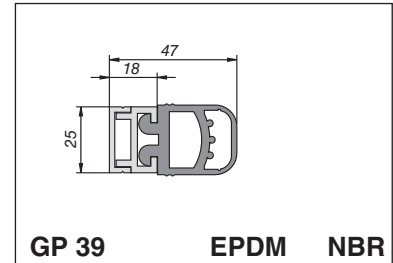


**GP 22** **NBR**

Actuation distance:  
at 10 mm/s 5 mm

Overtravel distance:  
at 10 mm/s 1 mm

Al - profile range: C 25

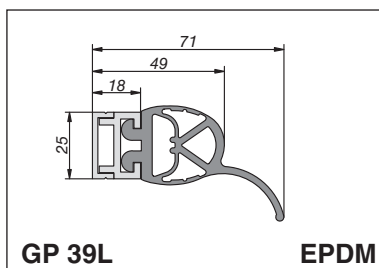


**GP 39** **EPDM** **NBR**

Actuation distance:  
at 10 mm/s 4 mm 5 mm

Overtravel distance:  
at 10 mm/s 2 mm 2 mm

Al - profile range: C 25 C 25

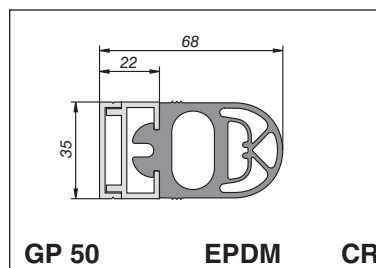


**GP 39L** **EPDM**

Actuation distance:  
at 10 mm/s 23 mm

Overtravel distance:  
at 10 mm/s 7 mm

Al - profile range: C 25

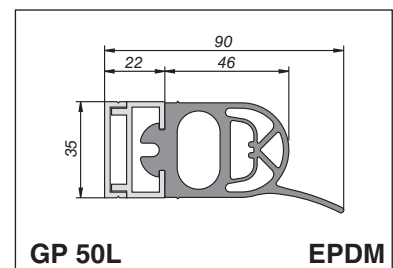


**GP 50** **EPDM** **CR**

Actuation distance:  
at 10 mm/s 8 mm 7 mm  
at 100 mm/s 15 mm 8 mm

Overtravel distance:  
at 10 mm/s 13 mm 5 mm  
at 100 mm/s 5 mm 4 mm

Al - profile range: C 35 C 35

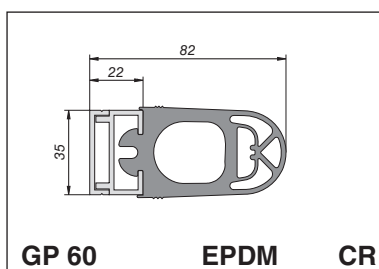


**GP 50L** **EPDM**

Actuation distance:  
at 10 mm/s 20 mm

Overtravel distance:  
at 10 mm/s 12 mm

Al - profile range: C 35

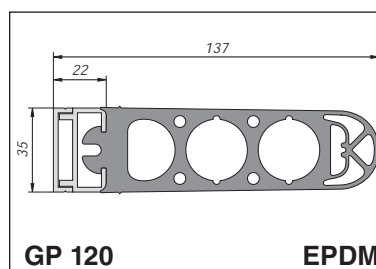


**GP 60** **EPDM** **CR**

Actuation distance:  
at 10 mm/s 7 mm 8 mm  
at 100 mm/s 10 mm 9 mm

Overtravel distance:  
at 10 mm/s 20 mm 7 mm  
at 100 mm/s 16 mm 6 mm

Al - profile range: C 35 C 35

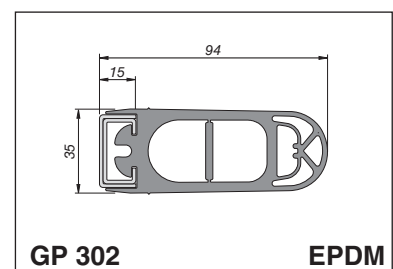


**GP 120** **EPDM**

Actuation distance:  
at 10 mm/s 11 mm

Overtravel distance:  
at 10 mm/s ca. 45 mm

Al - profile range: C 35



**GP 302** **EPDM**

Actuation distance:  
at 10 mm/s 13 mm  
at 100 mm/s 12 mm

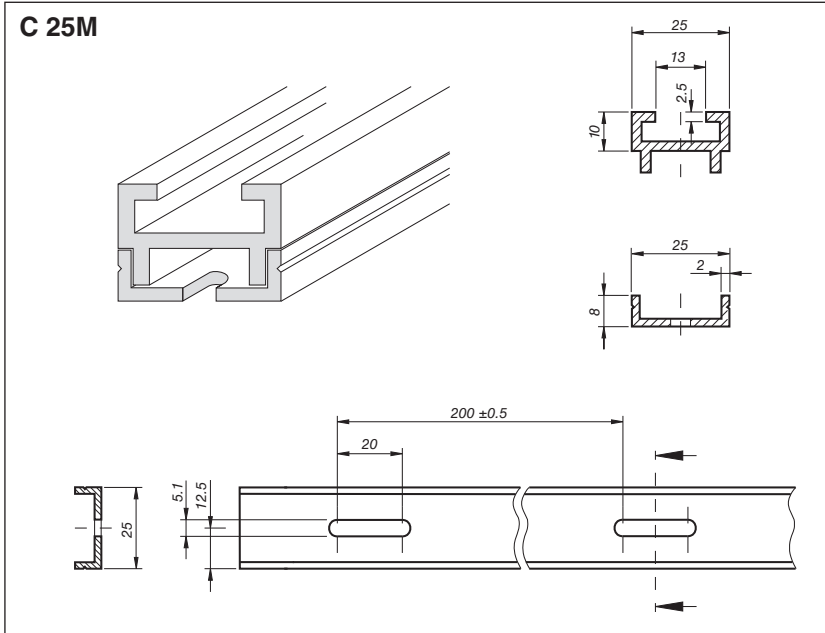
Overtravel distance:  
at 10 mm/s 25 mm  
at 100 mm/s 22 mm

Steel profile: C 27

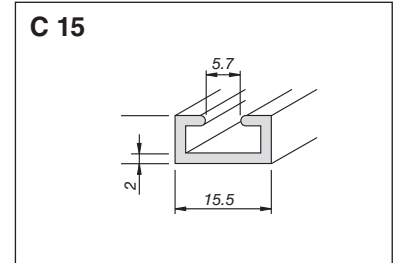
# Aluminium profile range C 15, C 25 and C 35

Dimensional tolerances: ISO 2768-v

## Aluminium profile range C 25 for GP 22 and GP 39(L)

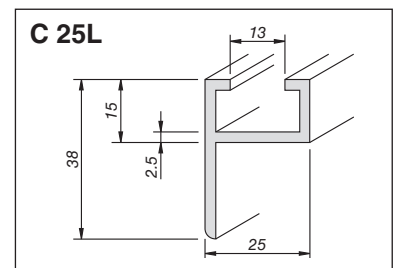
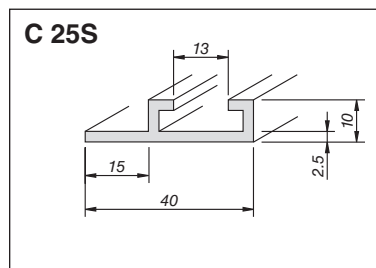
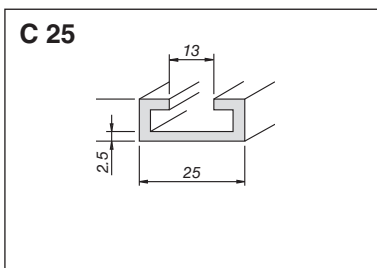


## Al-profile C 15 for GP 15

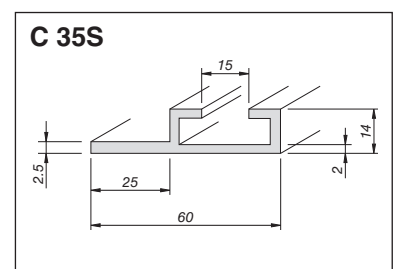
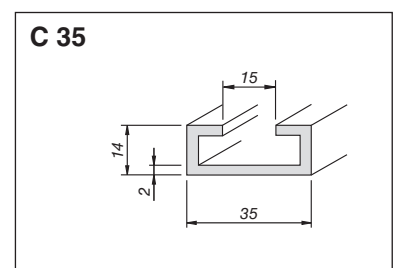
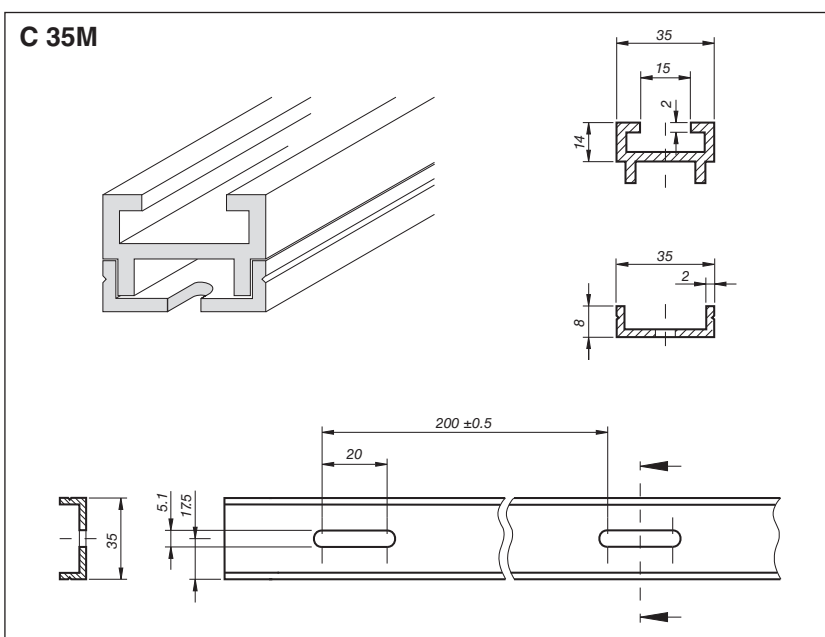


**Note C 25M / C 35M:**

Fix upper part to the lower part using self-tapping SK M3x8 DIN 7500 countersunk screws in pre-drilled positions



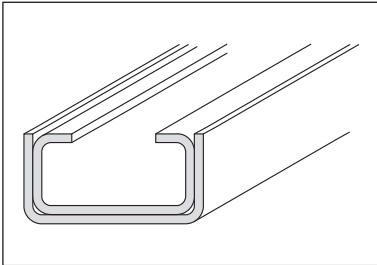
## Aluminium profile range C 35 for GP 50(L), GP 60 and GP 120



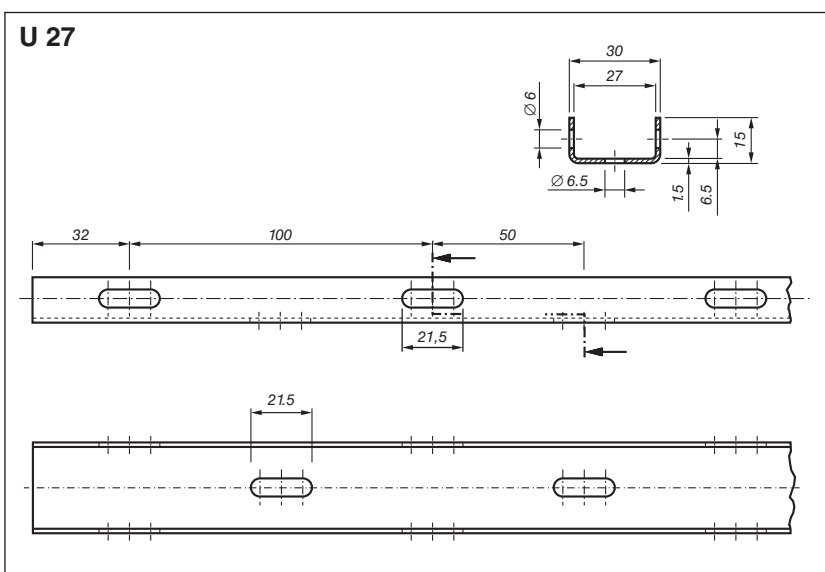
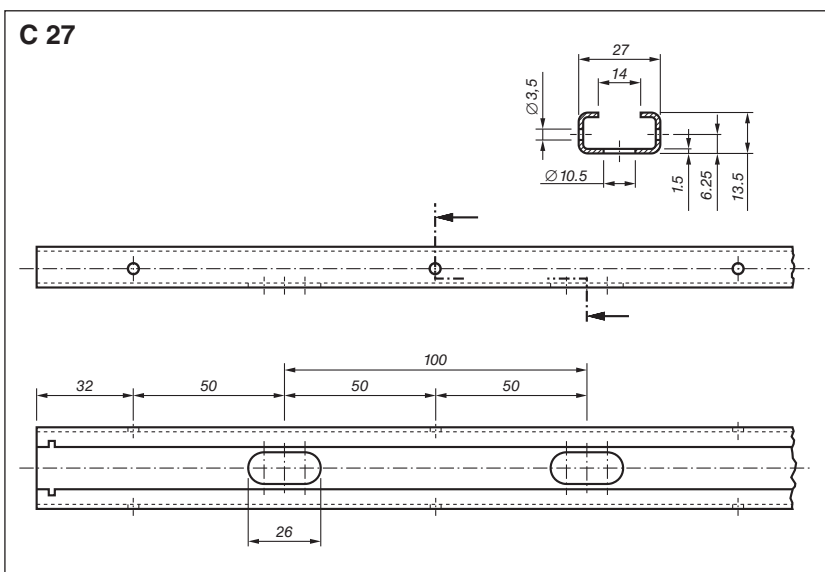
# Steel-Profile C 27 / U 27

Dimensional tolerances: ISO 2768-v

Profile for GP 302



**Fix the C-Profile**  
to the U-Profile using self-tapping SK M4x10 DIN 7500 countersunk screws in pre-drilled positions



270710 v1.0

*Subject to technical modifications.*

## Cable exits KA

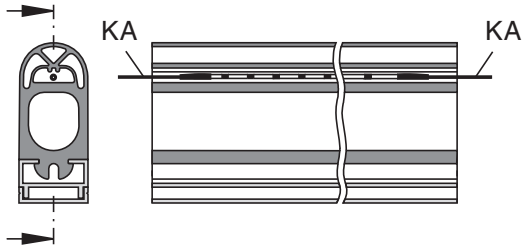
some with cable sleeves KT

**Note:** non-sensitive end = c. 35mm (standard)

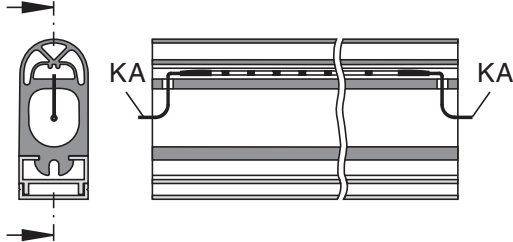
### Safety Edge Type BK

cable on both ends

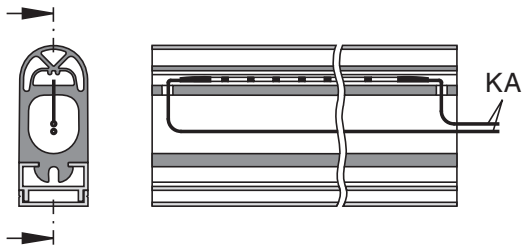
#### Version 1 GP 15, 22, 39(L), 50(L), 60, 120, 302



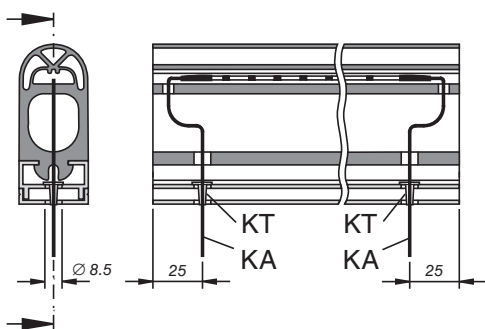
#### Version 3 GP 39(L), 50(L), 60, 120, 302



#### Version 4 GP 39(L), 50(L), 60, 120, 302



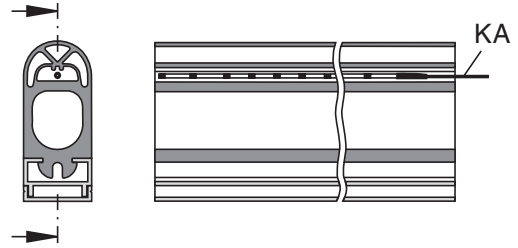
#### Version 5 GP 39(L), 50(L), 60, 120, 302



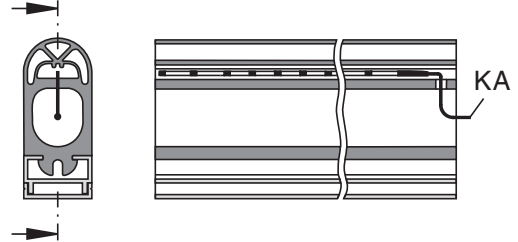
### Safety Edge Type W

with integrated resistor

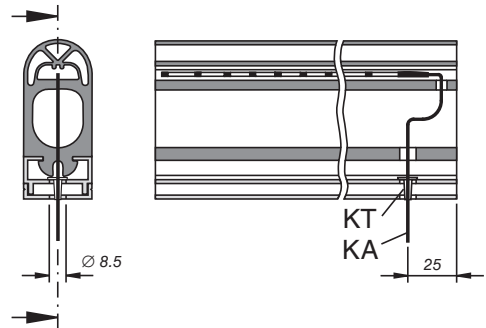
#### Version 9 GP 15, 22, 39(L), 50(L), 60, 120, 302



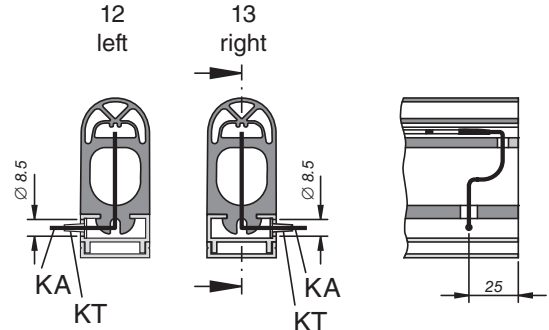
#### Version 10 GP 39(L), 50(L), 60, 120, 302



#### Version 11 GP 39(L), 50(L), 60, 120, 302



#### Version 12/13 GP 39(L), 50(L), 60



### ATTENTION

Max. cable length to signal processing unit: 200 m

*Subject to technical modifications.*

For rubber profiles, type L, please note: the rubber lip is always on the left side looking at the cross section (to the left of the intersection line).

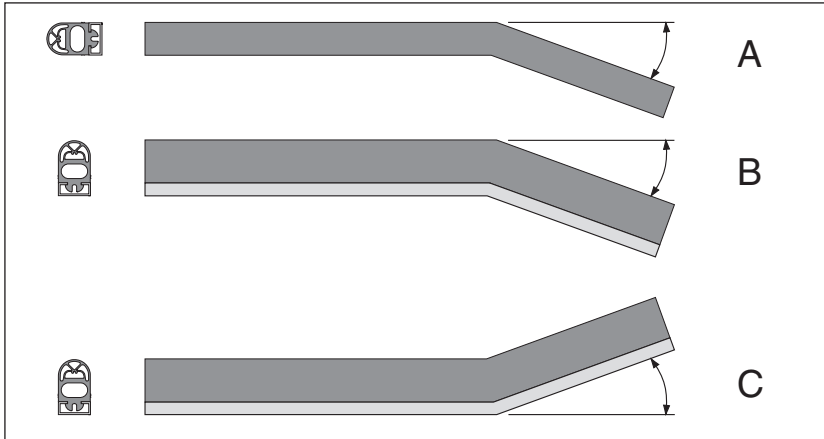
other variations (e.g. smaller non-sensitive areas on ends) on enquiry



## Lateral bends and radii

### Lateral bends

All Al-profiles from the C25 and C35 range are suitable for bend angles. The Al-profile must be prepared at our plant for this.



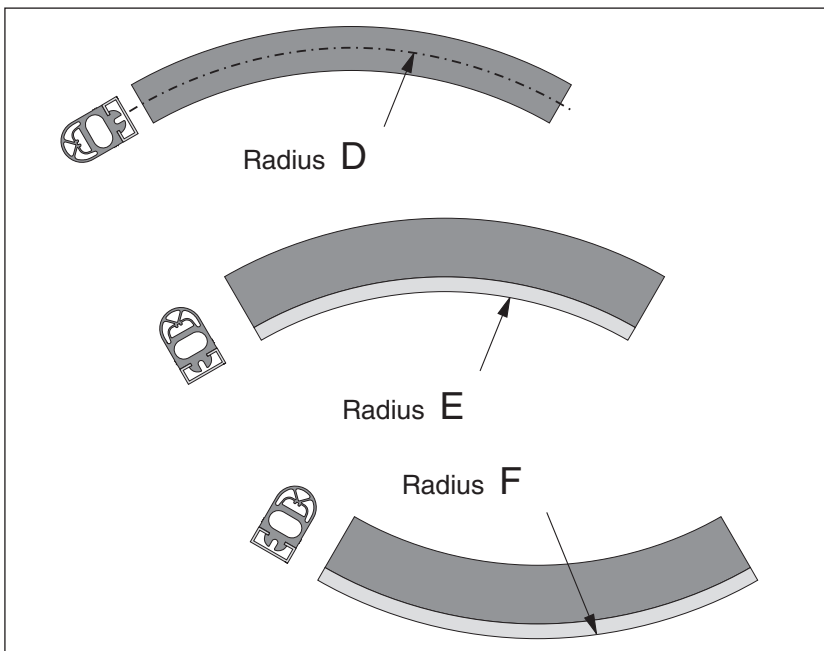
### Maximum lateral bend

Bend type:	A	B	C
GP 22	30°	25°	10°
GP 39	25°	20°	5°
GP 50	20°	20°	15°
GP 60	16°	15°	10°
GP 120	15°	15°	5°

Angled Safety Edges (type A to 90°): see custom-made section.

### Radii

Safety Edges with a radius are only available with C 25 and C 35 Al-profiles. The Al-profile must be prepared at our plant for this.



### Minimum radius in mm

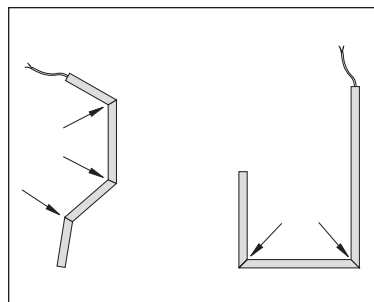
Radius type:	D	E	F
GP 22	300	300	350
GP 39	300	300	350
GP 50	350	400	400
GP 60	350	450	550
GP 120	500	–	–

### Note:

Lateral bends and radii are not covered by the EC-certification of design.

### Custom-made

- temperature resistant version  
short term (< 5 min) up to 120 °C  
long term (> 5 min) up to 100 °C  
Degree of protection: IP50
- angled Safety Edges with sensitive zones in problem areas
- Safety Edges with active ends possible using GP39 upwards



Subject to technical modifications.

## Overall view of combinations

Safety Edges SL	GP 15	GP 22	GP 39	GP 39L	GP 50	GP 50L	GP 60	GP 120	GP 302
<b>Material</b>									
NBR	●	●	●						
EPDM			●	●	●	●	●	●	●
CR					●		●		
<b>Mounting</b>									
C 15	●								
C 25M/S/L		●	●	●					
C 35M/S					●	●	●	●	
C 27 / U 27									●
<b>Monitoring resistor</b>									
1k2	●	●	●	●	●	●	●	●	○
8k2	○	○	○	○	○	○	○	○	○
22k1	○	○	○	○	○	○	○	○	●
<b>Control Unit</b>									
SG-EFS 1X4 ZK2/1	●	●	●	●	●	●	●	●	○
SG-SLE 04-0X1	○	○	○	○	○	○	○	○	●
SG-SUE 41X4 NA	○	○	○	○	○	○	○	○	○

● = Standard ○ = Option

### How to order:

Example 1 - Fully assembled Safety Edge without control unit:  
 SL/BK 2,250 mm GP 50 NBR + Al-Profile C 35M  
 Cable 10 m, Version 4 (siehe 3.8)

Example 2 - Fully assembled Safety Edge with control unit (230 V):  
 SL/W 3,700 mm GP 60 EPDM + Al-Profile C 35M  
 Cable 5 m, Version 11 (see 3.8)  
 Control Unit SG-EFS 134 ZK 2/1 (1k2)

Example 3 - Fully assembled Safety Edge, 4-wire-connection system  
 with control unit (230V):  
 SL/BK 1,650 mm GP 39 NBR + Al-Profile C 25M  
 Cable 2 m, Version 3 (see 3.8)  
 Control Unit SG-SUE 4134 NA

Subject to technical modifications.

## Technical data GP 39, GP 50, GP 60

Safety Edges consisting of sensor SL/W and SL/BK  
at rubber profiles GP 39/50/60 with aluminium profile and Control Unit.

1	Degree of protection sensor	IP65			IP65		
2	Switching operations sensor	> 10 <sup>5</sup>			> 10 <sup>5</sup>		
3	Sensor	<b>GP 39</b>	<b>GP 50</b>	<b>GP 60</b>	<b>GP 50</b>	<b>GP 60</b>	<b>GP 50</b>
		<b>EPDM</b>	<b>EPDM</b>	<b>EPDM</b>	<b>CR</b>	<b>CR</b>	<b>EPDM</b>
	with Control Unit SG-	EFS 1X4 ZK2/1			EFS 1X4 ZK2/1		SLE 04-0X1
3.1	Response time	38 ms	144 ms	95 ms	72 ms	82 ms	575 ms
	Test speed	100 mm/s	100 mm/s	100 mm/s	100 mm/s	100 mm/s	10 mm/s
3.2	Control command reset	either manual or automatic			manual / automatic		automatic
4	Actuation force, actuation distance, overtravel and switching angle	Testing basis: EN 1760-2					
4.1	Actuation force	< 150 N	< 150 N	< 150 N	< 150 N	< 150 N	< 150 N
4.2	Actuation distance						
	at 10 mm/s	4 mm	8 mm	7 mm	7 mm	8 mm	6 mm
	at 100 mm/s	4 mm	15 mm	10 mm	8 mm	9 mm	–
4.3	Overtravel distance						
	at 10 mm/s	2 mm	13 mm	20 mm	5 mm	7 mm	13 mm
	at 100 mm/s	1 mm	5 mm	16 mm	4 mm	6 mm	–
4.4	Effective actuation angle	45°	90°	90°	90°	90°	90°
5	Error behaviour	EN 954 Category 3			EN 954 Category 3		
6	Operating and environmental conditions						
6.1	Operating temperature						
	Sensor	-20 °C to +55 °C			-20 °C to +55 °C		
7	Operation – Maintenance						
7.1	Maintenance	The sensor is maintenance free.					
7.2	Monitoring	The control unit aids monitoring					
7.3	Expert inspection (once per year)	<ul style="list-style-type: none"> <li>• Depending on the amount of use the sensors are to be checked regularly for correct operation and visible signs of damage by manual operation or by applying the relevant test piece.</li> <li>• The correct position of the rubber profile in the aluminium profile is to be checked.</li> </ul>					
8	Chemical resistance	The sensor is resistant to customary-chemical influences such as diluted-acids, alkaline solutions and alcohol-for an exposure duration of 24 hours.					
9	Dimensional tolerances						
	Rubber profile	ISO 3302 E2/L2					
	Al-profile	ISO 2768-v					

## Technical data GP 302

Safety Edges consisting of sensor SL/W and SL/BK  
at rubber profiles GP 302 with Steel-Profile and Control Unit

1	Degree of protection sensor	IP65	IP65
2	Switching operations sensor	$> 10^4$	$> 10^4$
3	Sensor	<b>GP 302</b> <b>EPDM</b>	<b>GP 302</b> <b>EPDM</b>
	with Control Unit SG-	EFS 1X4 ZK2/1	SLE 04-0X1
3.1	Response time	115 ms	120 ms
	Test speed	100 mm/s	100 mm/s
3.2	Control command reset	either manual or automatic	automatic
4	Actuation force, actuation distance, overtravel and switching angle		
	Testing basis: EN 1760-2		
4.1	Actuation force	$< 150$ N	$< 150$ N
4.2	Actuation distance		
	at 10 mm/s	13 mm	13 mm
	at 100 mm/s	12 mm	12 mm
4.3	Overtravel distance		
	at 10 mm/s	25 mm	25 mm
	at 100 mm/s	22 mm	22 mm
4.4	Effective actuation angle	$90^\circ$	$90^\circ$
5	Error behaviour	EN 954 Category 3	EN 954 Category 3
6	Operating and environmental conditions		
6.1	Operating temperature		
	Sensor	$0^\circ\text{C}$ to $+55^\circ\text{C}$	$0^\circ\text{C}$ to $+55^\circ\text{C}$
7	Operation – Maintenance		
7.1	Maintenance	The sensor is maintenance free.	
7.2	Monitoring	The control unit aids monitoring	
7.3	Expert inspection (once per year)	<ul style="list-style-type: none"> <li>• Depending on the amount of use the sensors are to be checked regularly for correct operation and visible signs of damage by manual operation or by applying the relevant test piece.</li> <li>• The correct position of the rubber profile in the aluminium profile is to be checked.</li> </ul>	
8	Chemical resistance	The sensor is resistant to customary-chemical influences such as diluted-acids, alkaline solutions and alcohol-for an exposure duration of 24 hours.	
9	Dimensional tolerances		
	Rubber profile	ISO 3302 E2/L2	
	Steel-profile ISO 2768-v		

# Request for quotation

**From:**

Company

Department

Name, first name

P. O. Box

Post code

City

Street

Post code

City

Phone

Fax

E-mail

**Fax:****+49 731 2061-222****Area of application**

(e.g. door and gate systems, machine closing edges, textile machines, local public transport, ...)

↓ Please keep free ↓

For internal use only

**Environmental conditions** dry water oil aggressive Coolant, type: \_\_\_\_\_

substances::

 Solvent, type: \_\_\_\_\_ other: \_\_\_\_\_ room temperature other: from \_\_\_\_\_ °C to \_\_\_\_\_ °C**Mechanical conditions** The stopping distance of the system is max. \_\_\_\_\_ mm sensitive ends non-sensitive ends permitted cable exit version \_\_\_\_\_ number of monitoring circuits: \_\_\_\_\_ SG- \_\_\_\_\_**Pinching and shearing edges to be protected::**

(Diagram incl. mounting possibility and cable routing)