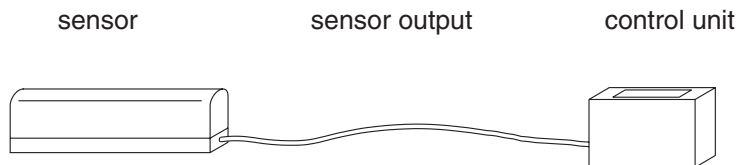


## Proven Safety

## Safe Edges 2.1.1 Product Range

### Safe Edges

Safe Edges are protective devices comprising sensor(s), control device and output signal switching device(s).



The control unit is made up of control device and output signal switching device(s).

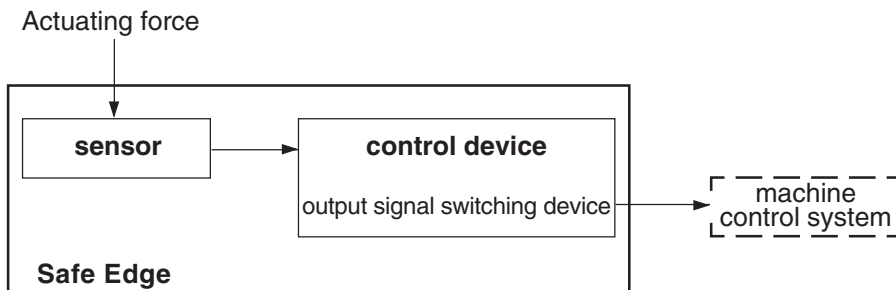
### Sensor

The sensor is that part of the Safe Edge which produces a signal when the actuating force is applied. Mayser Safe Edges have a sensor whereby the actuating surface is deformed locally, eg. it is made of rubber.

### Control device

The control device is that part of the Safe Edge which reacts to the sensor status and produces output signals, which are transmitted to the machine control system.

The output signal switching device is that part of the control device which is connected to the machine control system and transmits safety output signals.



### The following points should be considered when choosing the sensors:

- temperature range
- response time
- protection class (standard: IP65)
- environmental considerations (oil, coolant, ...)

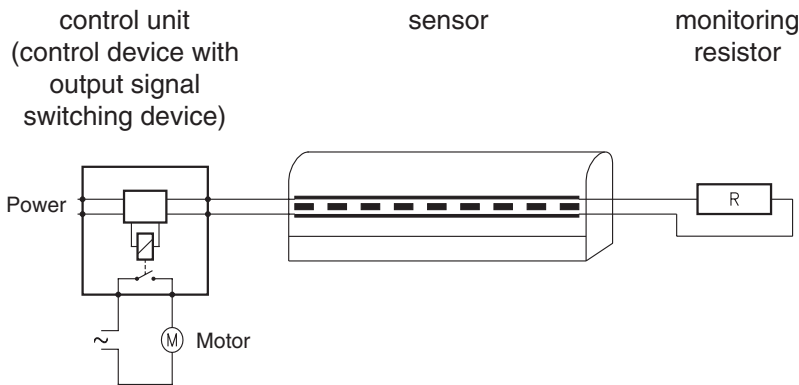
#### PLEASE NOTE:

The certification of design becomes invalid if our products are used in combination with control units or sensors which do not comply with the tested types.

Subject to technical modifications.

**2-wire-connection system  
(with monitoring resistor)**

**Safe Edges 2.2.1  
Product Range**

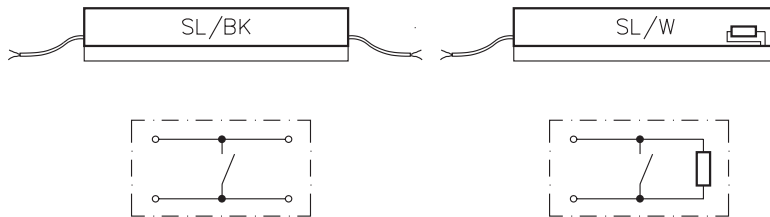


The Safe Edge comprises sensor, control device and output signal switching device. The control device and the output signal switching device are combined in the control unit.

**Types**

- SL/BK Through sensor with cable exit on both ends or for connecting up an external monitoring resistor
- SL/W with integrated monitoring resistor

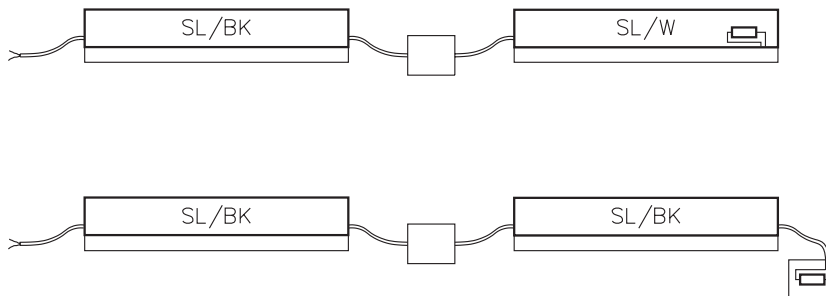
For your safety:  
The sensor and the connecting cable are constantly monitored for function. A control function is attained by bridging the conductive areas with a monitoring resistor.



**Combination of sensors**

Example:

Combinations:  
- connection of several sensors  
- only one control unit necessary



Model with external resistor, thus avoiding variety in type

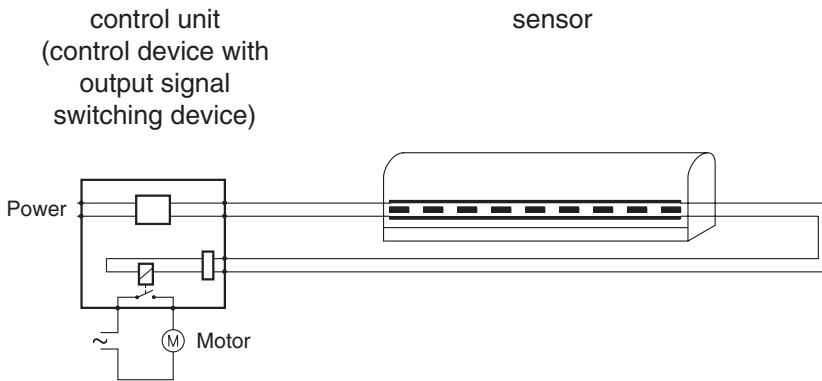
**Cable connection (standard)**

- cable: LiTPE Ø 3.8 mm; 2 x 0.25 mm<sup>2</sup>
- length of cable: 2 m / 5 m / 10 m
- cable ends without plug/socket  
option: cable ends can be supplied with plug/socket

Subject to technical modifications.

**4-wire-connection system  
(without monitoring resistor)**

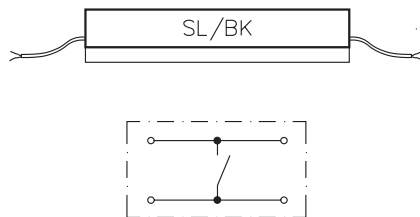
**Safe Edges 2.2.2  
Product Range**



The Safe Edge comprises sensor, control device and output signal switching device. The control device and the output signal switching device are combined in the control unit.

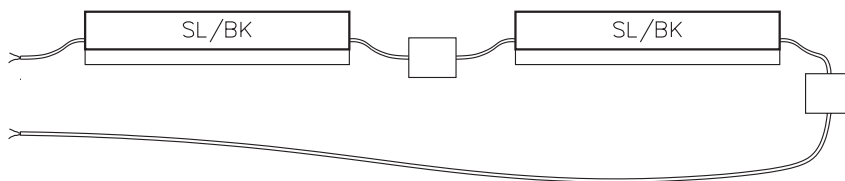
**Type**

SL/BK Through sensor with cable exit on both ends



For your safety:  
The sensor and the connecting cable are constantly monitored for function. The monitoring resistor is not required due to signal transmission feedback.

**Combination of sensors**



Combinations:  
- connection of several sensors  
- only one control unit necessary  
- connection to Safety Mats and Safety Bumpers possible

**Cable connection (standard)**

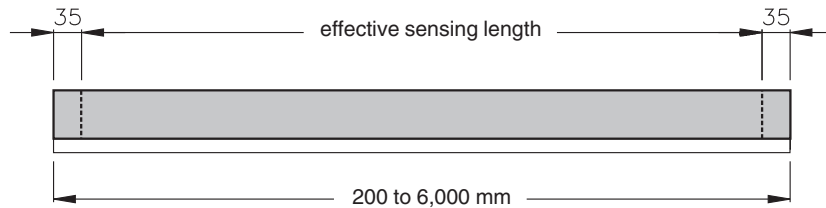
- cable: LiTPE Ø 3.8 mm; 2 x 0.25 mm<sup>2</sup>
- length of cable: 2 m / 5 m / 10 m
- cable ends without plug/socket  
option: cable ends can be supplied with plug/socket

**Note:**  
The 4-wire-connection system can only be applied using the control unit SG-SUE 41X4 NA.

Subject to technical modifications.

## Available lengths

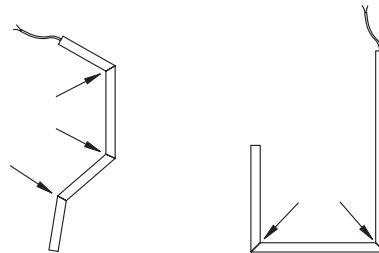
The sensors can be supplied in lengths between 200 and 6,000 mm. In the case of the standard Safe Edge both ends have a non-sensitive area 35 mm long.



## Safe Edges 2.3.1 Product Range

### Custom-built Safe Edges

- heat-resistant up to 120 °C
- angled Safe Edges with sensitive zones in problem areas
- Safe Edges can be supplied with sensitive ends from GP39 upwards



### Chemical Resistance

Rubber profile GP	EPDM	NBR	CR
<b>Material rating</b>			
Shore A-hardness	55 ±5	60 ±5	60 ±5
Application area	Doors/Gates	Machines	Machines
<b>Chemical Resistance</b>			
Acetone	+	±	+
Formic acid	+	+	+
Ammonia	+	+	+
ASTM-Oil Nr. 1/ 2/ 3	-	+	+
Fuel	-	+	±
Brake fluid	±	±	±
Chloride solutions	+	+	+
Diesel oil	-	+	+
Greases	-	+	+
Isopropyl alcohol	+	+	+
Methanol	+	+	±
Oils	-	+	+
Ozone / atmospheric cond.	+	-	+
Hydrochloric acid 10 %	+	+	+
Spirit (ethyl alcohol)	+	+	+
Carbon tetrachloride	-	+	-
Water and frost	+	-	±
Hydrogen peroxide 10 %	+	+	-
Household and sanitary cleaning agents	+	+	+

Tests were done at room temperature (23°C) .

Key to symbols:

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

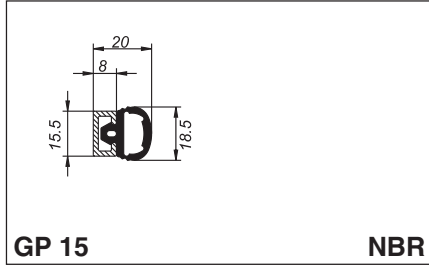
The data given are results of tests which were done in our laboratory to the best of our knowledge and belief. We cannot accept any obligations being deduced from them. You must always test the suitability of our products for your special application purpose under practical conditions.

Subject to technical modifications.

**Dimensions and switching distances**

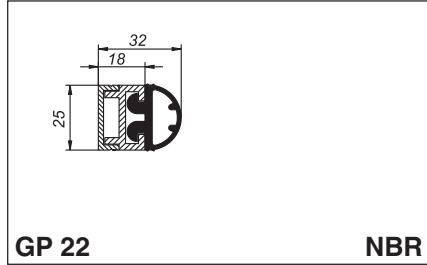
Actuating force: < 150 N (at 23 °C and with testpiece Ø 80 mm)  
Dimensional tolerances: DIN 7715 - E2/L2

**Safe Edges 2.5.1**  
**Standardprogramm**



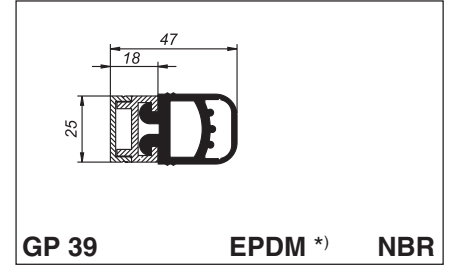
**GP 15 NBR**

Actuation distance:  
- at 10 mm/s 2 - 4 mm  
Overtravel: -  
Al-rail type: C 15



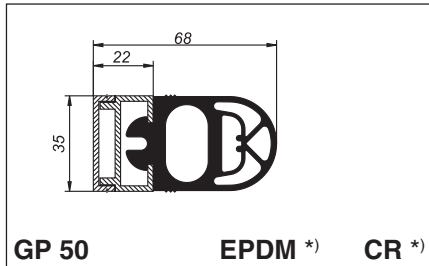
**GP 22 NBR**

Actuation distance:  
- at 10 mm/s 5 mm  
Overtravel:  
- at 10 mm/s 1 mm  
Al-rail type: C 25



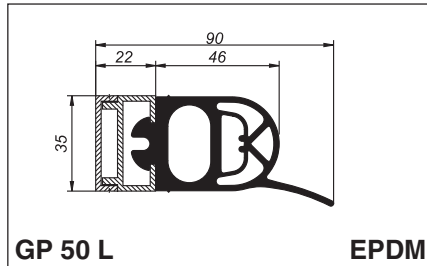
**GP 39 EPDM \*) NBR**

Actuation distance:  
- at 10 mm/s 4 mm 8 mm  
Overtravel:  
- at 10 mm/s 2 mm 9 mm  
Al-rail type: C 25 C 25



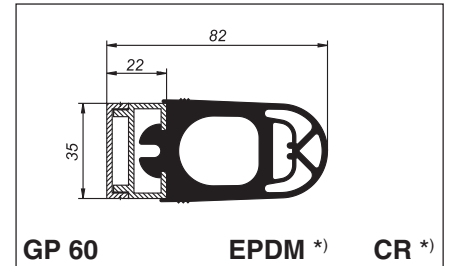
**GP 50 EPDM \*) CR \*)**

Actuation distance:  
- at 10 mm/s 9 mm 7 mm  
- at 100 mm/s 15 mm 8 mm  
Overtravel:  
- at 10 mm/s 13 mm 5 mm  
- at 100 mm/s 5 mm 4 mm  
Al-rail type: C 35 C 35



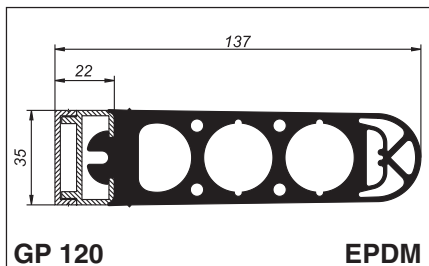
**GP 50 L EPDM**

Actuation distance:  
- at 10 mm/s 20 mm  
Overtravel:  
- at 10 mm/s 12 mm  
Al-rail type: C 35



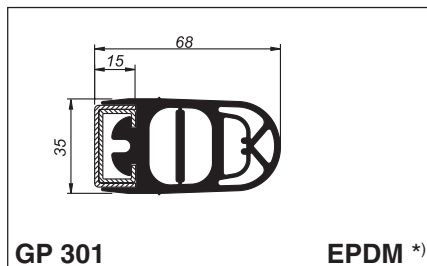
**GP 60 EPDM \*) CR \*)**

Actuation distance:  
- at 10 mm/s 7 mm 8 mm  
- at 100 mm/s 10 mm 9 mm  
Overtravel:  
- at 10 mm/s 20 mm 7 mm  
- at 100 mm/s 16 mm 6 mm  
Al-rail type: C 35 C 35



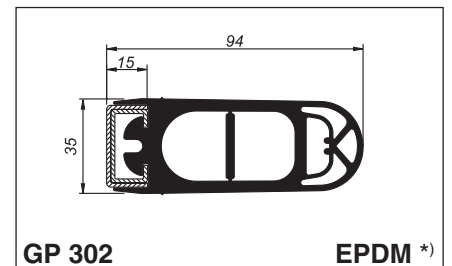
**GP 120 EPDM**

Actuation distance: 11 mm  
Overtravel: c. 45 mm  
Al-rail type: C 35



**GP 301 EPDM \*)**

Actuation distance:  
- at 10 mm/s 12 mm  
- at 100 mm/s 12 mm  
Overtravel:  
- at 10 mm/s 14 mm  
- at 100 mm/s 8 mm  
Steel rail type: C 27



**GP 302 EPDM \*)**

Actuation distance:  
- at 10 mm/s 10 mm  
- at 100 mm/s 12 mm  
Overtravel:  
- at 10 mm/s 25 mm  
- at 100 mm/s 22 mm  
Steel rail type: C 27

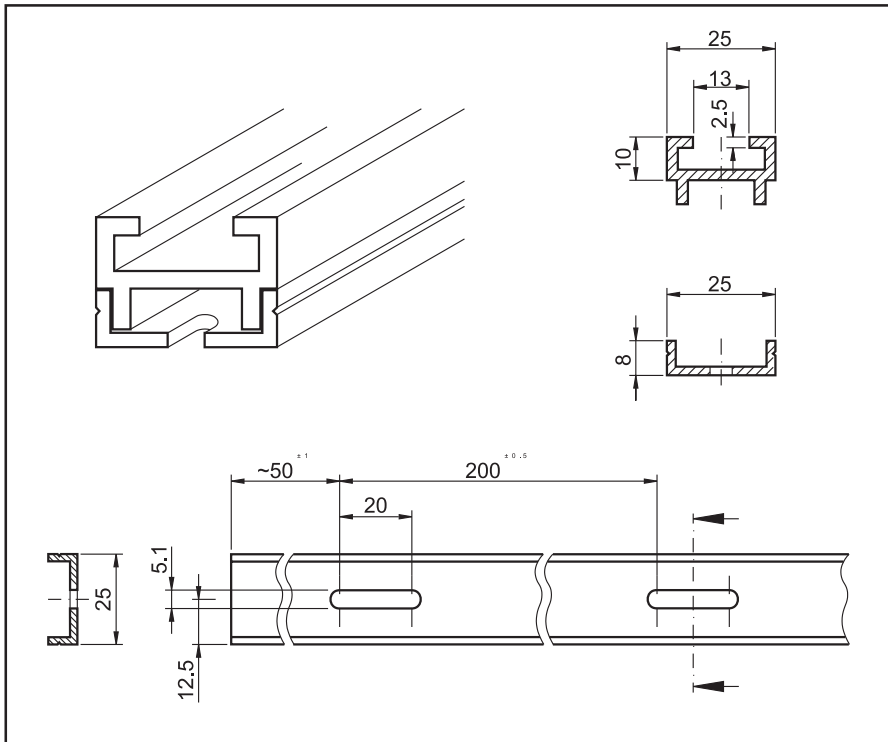
All given data marked with \*) are verified by EEC-type-examination certificates.

Subject to technical modifications.

**Dimensions Al-rail C 25**

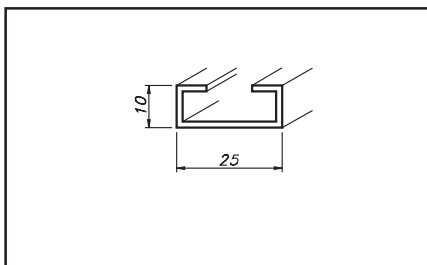
**Safe Edges 2.6.1**  
**Product Range**

**Rail for GP 22 / GP 39**



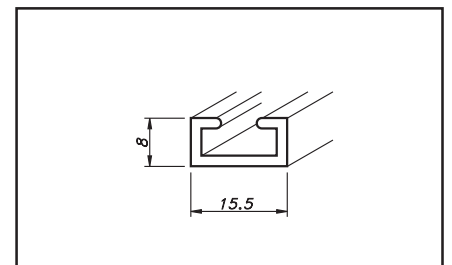
**Al-rail C 25 M**

Width:	25 mm
Height:	18 mm
Thickness:	
- top rail	2.5 mm
- bottom rail	2.0 mm



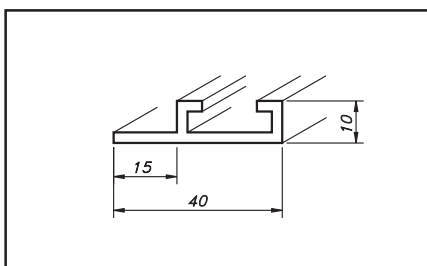
**Al-rail C 25**

Width:	25 mm
Height:	10 mm
Thickness:	2.5 mm



**Al-rail C 15 (for GP 15)**

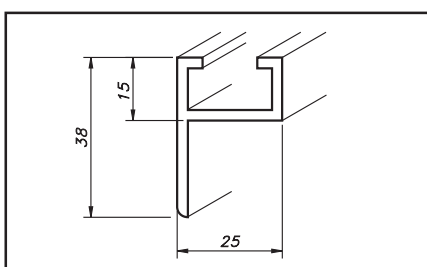
Width:	15.5 mm
Height:	8 mm
Thickness:	2 mm



**Al-rail C 25 S**

Width:	40 mm
Height:	10 mm
Thickness:	2.5 mm

As Al-rail C 25 except for side mounting flange



**Al-rail C 25 L**

Width:	25 mm
Height:	38 mm
Height of mounting flange:	23 mm
Thickness:	2.5 mm

As Al-rail C 25 except for rear mounting flange

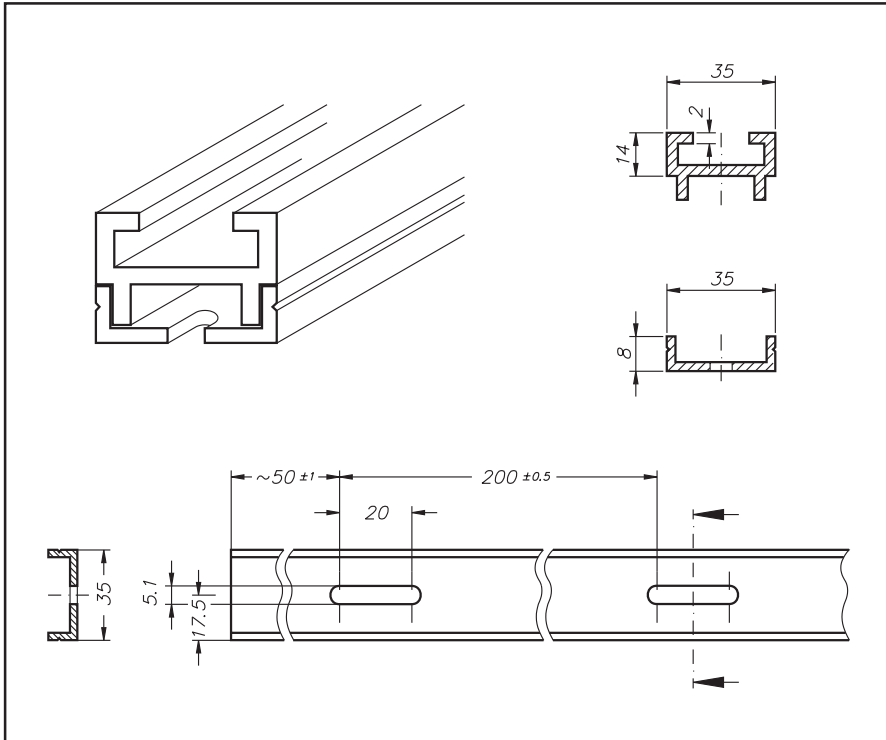
Al-rails: dimensional variation per DIN 17 615 Part 3

Subject to technical modifications.

**Dimensions Al-rail C 35**

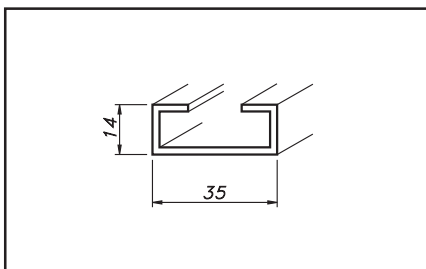
**Safe Edges 2.6.2**  
**Product Range**

**Rail for GP 50 / GP 60 / GP 120**



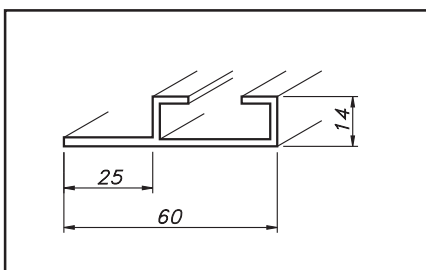
**Al-rail C 35 M**

Width:	35 mm
Height:	22 mm
Thickness:	
- top rail	2 mm
- bottom rail	2 mm



**Al-rail C 35**

Width:	35 mm
Height:	14 mm
Thickness:	2 mm



**Al-rail C 35 S**

Width:	60 mm
Height:	14 mm
Thickness:	2 mm
Thickness of mounting flange:	2.5 mm

As Al-rail C 35 except for side mounting flange

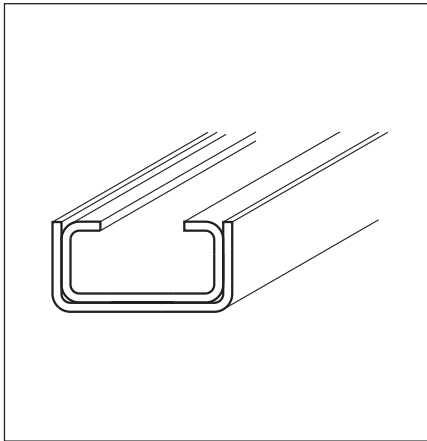
Al-rails: dimensional variation per DIN 17 615 Part 3

Subject to technical modifications.

**Dimensions Steel rail C 27 / U27**

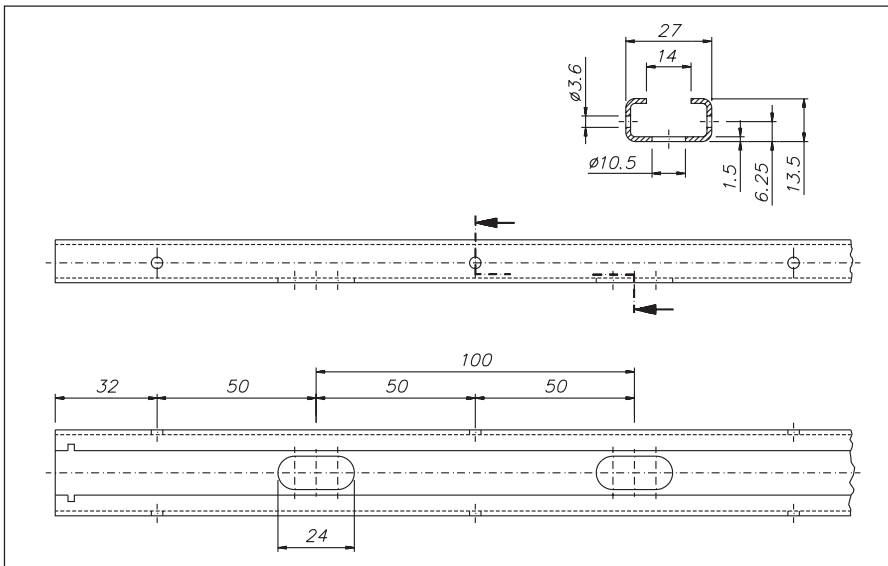
**Safe Edges 2.6.3  
Standardprogramm**

**Rail for GP 301 / GP 302**



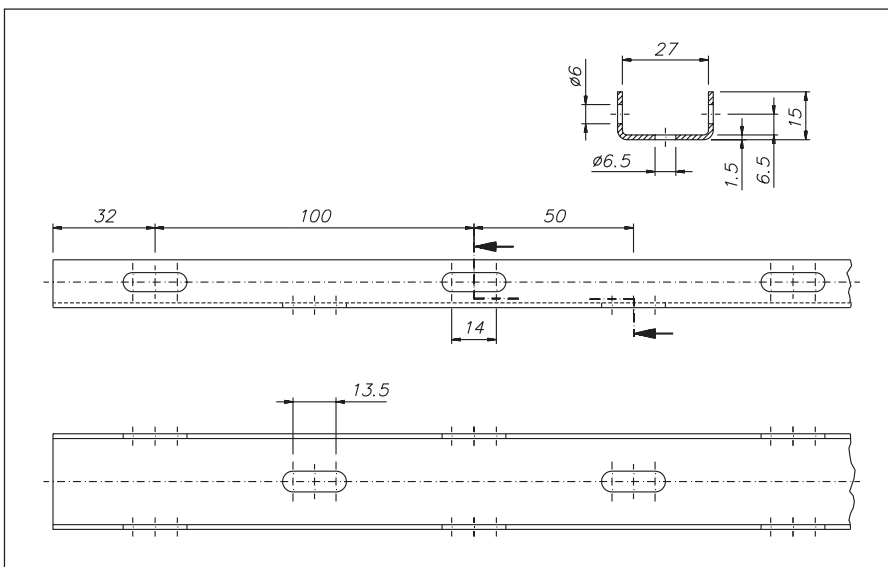
**Steel rail C 27 / U 27**

Width: 30 mm  
Height: 15 mm  
Thickness: 1.5 mm



**Steel rail C 27**

Width: 27 mm  
Height: 13,5 mm  
Thickness: 1.5 mm



**Steel rail U 27**

Outside width: 30 mm  
Inside width: 27 mm  
Height: 15 mm  
Thickness: 1.5 mm

Subject to technical modifications.

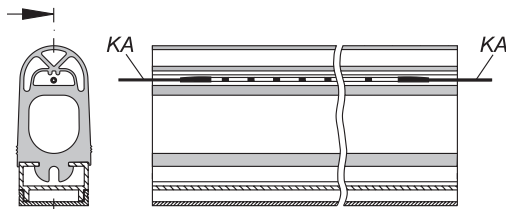
**Cable exits KA**  
some with cable sleeves KT

**Safe Edges** 2.7.1  
**Standardprogramm**

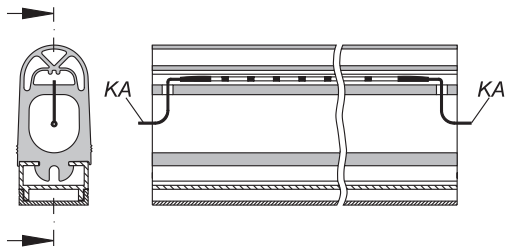
**Safe Edge Type BK**  
cable on both ends

**Safe Edge Type W**  
with integrated resistor

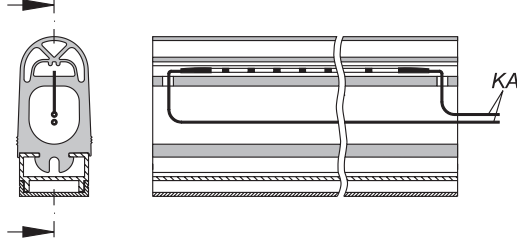
**Version 1** - for GP 15, 22, 39, 50, 60, 120, 301, 302



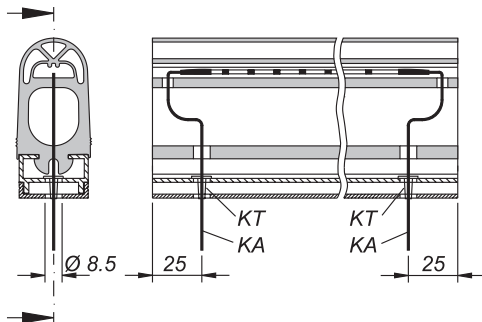
**Version 3** - for GP 39, 50, 60, 120, 301, 302



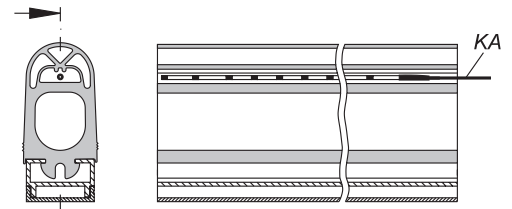
**Version 4** - for GP 39, 50, 60, 120, 301, 302



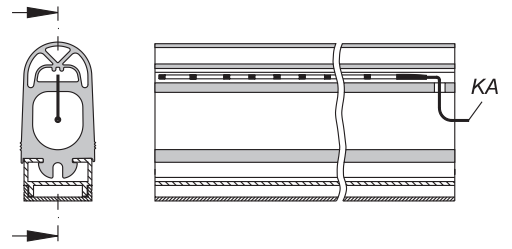
**Version 5** - for GP 39, 50, 60, 120, 301, 302



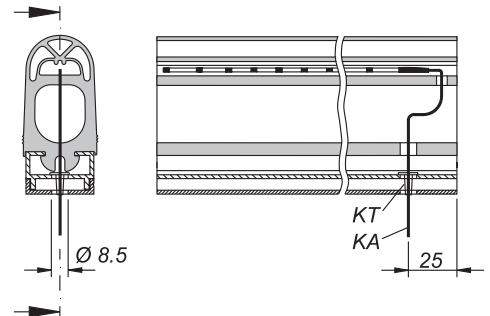
**Version 9** - for GP 15, 22, 39, 50, 60, 120, 301, 302



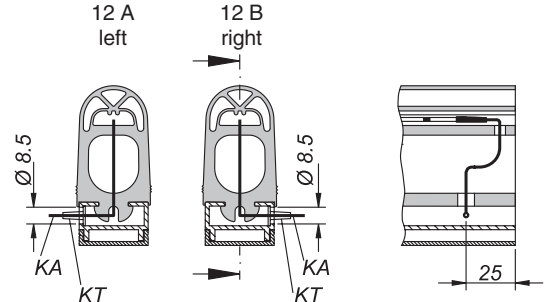
**Version 10** - for GP 39, 50, 60, 120, 301, 302



**Version 11** - for GP 39, 50, 60, 120, 301, 302



**Version 12** - for GP 39, 50, 60



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

**Note:** non-sensitive area on both ends  
standard c. 35 mm  
for GP 15 c. 50 mm

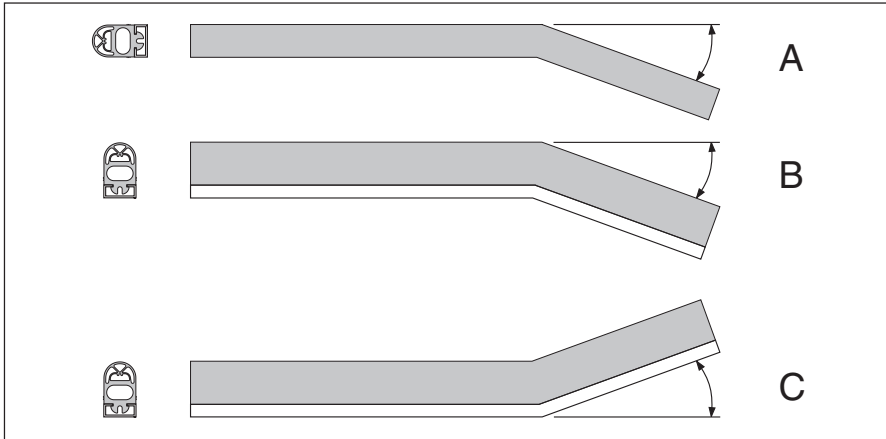
Subject to technical modifications.

## Lateral bends and radii

## Safe Edges 2.7.2 Sonderausführung

### Lateral bends

All C 25- and C 35 Al-rails can be bent laterally to suit at our plant. Dazu muß das Alu-Profil werkseitig vorbereitet werden.

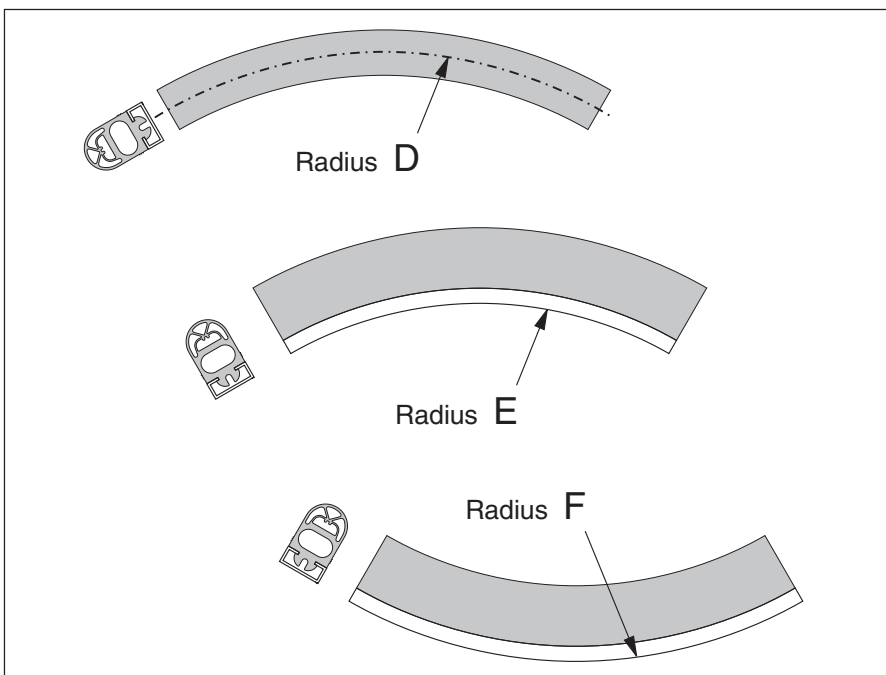


### Maximum lateral bend

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°

### Radii

Safe Edges with a radius are only available with C 25 and C 35 aluminium rails. Dazu muß das Alu-Profil werkseitig vorbereitet werden.



### Minimum radius in mm

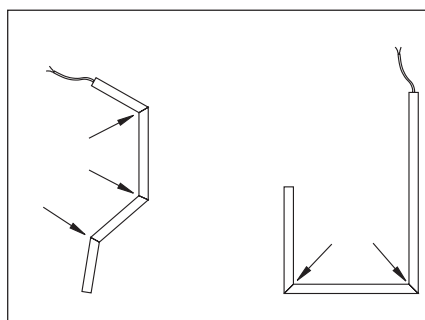
Radius type:	D	E	F
GP 22	300	300	350
GP 39	300	300	350
GP 50	350	400	400
GP 60	350	450	550
GP 120	500	–	–

**Please note:**

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

### Custom-built Safe Edges

- temperaturbeständige Ausführung  
kurzzeitig bis 120 °C  
langzeitig bis 100 °C  
Schutzart: IP 50
- angled Safe Edges with sensitive zones in problem areas
- Safe Edges can be supplied with sensitive ends from GP39 upwards



**Overall view of combinations**

**Safe Edges  
Overall view**

2.8.1

Safe Edges SL	GP 15	GP 22	GP 39	GP 50	GP 60	GP 120	GP 301	GP 302
<b>Material</b>								
NBR	●	●	●					
EPDM			●	●	●	●	●	●
CR				●	●			
<b>Mounting</b>								
C 15	●							
C 25 M / S / L		●	●					
C 35 M / S				●	●	●		
C 27 / U 27							●	●
<b>Monitoring resistor</b>								
1.2 kΩ	●	●	●	●	●	●	○	○
8.2 kΩ	○	○	○	○	○	○	○	○
22.1 kΩ	○	○	○	○	○	○	●	●
<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 Safe Edge without control unit:  
SL/BK 2,250 mm GP 50 NBR + C 35 M al-rail  
Cable 10 m, Version 4 (see 2.3.6)

Example 2 - Fully assembled Safe Edge with control unit (230 V):  
SL/W 3,700 mm GP 60 EPDM + C 35 M al-rail  
Cable 5 m, Version 11 (see 2.3.6)  
Control unit SG-EFS 134 ZK 2/1 (1.2 kΩ)

Example 3 - Fully assembled Safe Edge, 4-wire-connection system  
with control unit (230V):  
SL/BK 1,650 mm GP 39 NBR + C 25 M al-rail  
Cable 2 m, Version 3 (see 2.3.6)  
Control unit SG-SUE 4134 NA

Subject to technical modifications.

**Data Sheet**

**Safe Edges 2.9.1**  
**Datenblätter**

Safe Edge comprising sensor SL/W and SL/BK assembled in rubber profile GP 39/50/60 with mounting rail and control unit

1. Protection class sensor *)	IP 65			IP 65		
2. Switching operations sensor *)	> 10 <sup>5</sup>			> 10 <sup>5</sup>		
3. Switching times	<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>
Control unit SG-	EFS 1X4 ZK2/1			EFS 1X4 ZK2/1		
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 Reset	manual or automatic			manual / automatic		automatic
4. Actuating force, actuating distance, overtravel and switching angle	Testing basis:					
	prEN 1760-2			yes		
	DIN V 31006 T2, Type			A		
	GS-BE-17			yes		
4.1 Actuating force *)	< 150 N	< 150 N	< 150 N	< 150 N	< 150 N	< 150 N
4.2 Actuating distance *)						
at 10 mm/s	4 mm	9 mm	7 mm	7 mm	8 mm	11 mm
at 100 mm/s	4 mm	15 mm	10 mm	8 mm	9 mm	–
4.3 Overtravel *)						
at 10 mm/s	2 mm	13 mm	20 mm	5 mm	7 mm	11 mm
at 100 mm/s	1 mm	5 mm	16 mm	4 mm	6 mm	–
4.4 Effective switching angle *)	45°	90°	90°	90°	90°	40°
5. Behaviour in fault instance	Category 3 per EN 954-1			Category 3 per EN 954-1		
6. Operating and environmental conditions						
6.1 Ambient temperature sensor *)						
GS-BE-17	- 20 °C to + 55 °C			- 20 °C to + 55 °C		
DIN V 31 006 T2, Type A	- 20 °C to + 55 °C			+ 5 °C to + 55 °C		
DIN V 31 006 T2, Type B	+ 5 °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) per ZH 1/494	<ul style="list-style-type: none"> <li>• Depending on the working rate, the sensors should be tested for function at regular intervals either manually or by applying the relevant testpiece. A visual examination for damages should also be carried out.</li> <li>• Test to insure that the rubber profile is sitting properly in the aluminium retaining rail.</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	<ul style="list-style-type: none"> <li>• Length of SL per DIN 7715-L2</li> <li>• Distances per DIN ISO 2768-v</li> </ul>					

All given data marked with \*) are verified by EEC-type-examination certificates.

**Data Sheet**

**Safe Edges  
Datenblätter**

**2.9.2**

Safe Edge comprising sensor SL/W and SL/BK assembled in rubber profile GP 301/302 with mounting rail and control unit

1. Protection class sensor <sup>*)</sup>	IP 65	IP 65
2. Switching operations sensor <sup>*)</sup>	> 10 <sup>4</sup>	> 10 <sup>4</sup>
3. Switching times	<b>GP 301</b> <b>GP 302</b> <b>EPDM</b> <b>EPDM</b>	<b>GP 301</b> <b>GP 302</b> <b>EPDM</b> <b>EPDM</b>
Control unit	SG-EFS 1X4 ZK2/1	SG-SLE 04-0X1
3.1 Response time <sup>*)</sup>	124 ms    125 ms	112 ms    113 ms
Test speed	100 mm/s    100 mm/s	100 mm/s    100 mm/s
3.2 Reset	manual or automatic	automatic
4. Actuating force, actuating distance, overtravel and switching angle		
Testing basis:	prEN 1760-2, GS-BE-17	prEN 1760-2, GS-BE-17
4.1 Actuating force <sup>*)</sup>	< 150 N    < 150 N	< 150 N    < 150 N
4.2 Actuating distance <sup>*)</sup>		
at 10 mm/s	12 mm    13 mm	13 mm    10 mm
at 100 mm/s	12 mm    12 mm	12 mm    12 mm
4.3 Overtravel <sup>*)</sup>		
at 10 mm/s	14 mm    25 mm	8 mm    25 mm
at 100 mm/s	8 mm    22 mm	6 mm    22 mm
4.4 Effective switching angle <sup>*)</sup>	90°    90°	90°    90°
5. Behaviour in fault instance	Category 3 per EN 954-1	Category 3 per EN 954-1
6. Operating and environmental conditions		
6.1 Ambient temperature sensor <sup>*)</sup>		
GS-BE-17	- 20 °C to + 55 °C	- 20 °C to + 55 °C
DIN V 31 006 T2, Type A	0 °C to + 55 °C	0 °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) per ZH 1/494	<ul style="list-style-type: none"> <li>• Depending on the working rate, the sensors should be tested for function at regular intervals either manually or by applying the relevant testpiece. A visual examination for damages should also be carried out.</li> <li>• Test to insure that the rubber profile is sitting properly in the aluminium retaining rail.</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	<ul style="list-style-type: none"> <li>• Length of SL per DIN 7715-L2</li> <li>• Distances per DIN ISO 2768-v</li> </ul>	

All given data marked with <sup>\*)</sup> are verified by EEC-type-examination certificates.