Safety Edges

SpeedSPEC
Edges
sti.com

For full product information, visit www.sti.com. Use the SpeedSPEC Code for quick access to the specific web page.

Safety Edges (SGE & SCS Series Profiles)

- Profile materials NBR (SCS series only), EPDM or TPE
- Available in six sizes for SGE Series and two sizes for SCS Series

Applicable Controllers

- SCC-1224 Single-Channel Controller
- SCC-1224ND Single-Channel Controller

E

Description

Safety edges are used on edges of guards and gates at possible crushing or shearing points. They are used on gates, machines, and handling equipment to protect people and equipment. Our SGE Series safety edges use the innovative design of co-extruded safety contact as an integral part of the safety edge. A complete unit consists of an aluminum mounting channel, the safety contact, and the safety edge. The special shapes of the EPDM, TPE, or NBR rubber profiles protect the safety contact from damage and allows actuation angles to exceed 90 degrees.

The last safety edge in a serial connection is terminated with a resistor, which is continuously monitored by the controller. This allows the entire circuit to be monitored for shorts and wire breaks.

The SGE Design

SGE series profiles are patented and offer improved technical characteristics with fewer components. Inside the safety edge is the co-extruded switching unit, which consists of two conductive rubber extrusions inside the chamber and a high-isolating material EPDM or TPE outer. Inside of each conductive rubber extrusion is a copper wire with low-resistance evaluation. The molded wiring plug at each end ensures the constant contact of the two conductive rubber extrusions of the switching unit. The end caps seal and protect the safety contact from dirt and water ingression. This innovative design significantly reduces assembly time, saving both time and money.

Important features of the SGE profile:

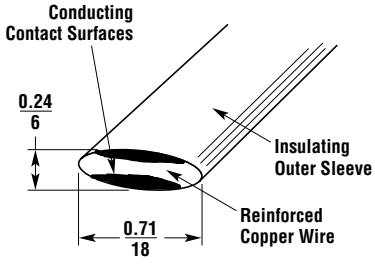
- Fast, accurate response even during lateral application of force
- Fewer components required for complete assembly
- Fast and easy assembly
- Integrated water drain (some models)
- Reduced weight

The SGE profile is currently available in six sizes from 8 mm to 65 mm in height. Profiles are available with sealing lips for applications such as doors.

The SCS Design

In SCS series safety edges, the safety contact is inserted into the switching chamber of the safety edge. The two ends are then sealed with a permanently elastic adhesive and end caps to keep the unit watertight.

All SCS series safety edges are available in NBR only.



Specifications

	SGE-88	SGE-1510	SGE-125	SGE-225	SGE-245/ SGE-245L	SGE-365 (Black)	SGEY-365 (Yellow)	SCS-2525	SCS-2540
Material:	EPDM	TPE	TPE	EPDM	EPDM	EPDM	TPE	NBR	NBR
Mounting:	DBL Side Tape	Integrated Angle on Profile or SCA-15-9	SCA-15-9	SCA-25/25L	SCA-25/25L	SCA-35/35L	SCA-35/35L	SCA-25/25L	SCA-25/25L
Material Hardness:	68 Shore A	65 Shore A	65 Shore A	68 Shore A	68 Shore A	68 Shore A	68 Shore A	68 Shore A	68 Shore A
Max. Length of a Single Safety Edge:	6.1 m								
Weight:	0.05 kg/m	0.11 kg/m	0.18/0.20 kg/m	0.51/0.5 kg/m	0.77/0.82 kg/m	1.10 kg/m	1.10 kg/m	0.37 kg/m	0.48 kg/m
Enclosure:	IP65								
Mechanical Stability*1:	500 N								
Actuation Distance:	2.1 mm	4.23 mm	7.6 mm	4.5 mm	9.4 mm	5.16 mm	5.16 mm	5.4 mm	4.1 mm
Actuation Force:	70 N with 10 mm/s	88 N with 50 mm/s	76 N	87 N	118 N	72.1 N	72.1 N	134 N	70 N
Maximum Deformation at 400 N:	4.4 mm	4.7 mm	8.6 mm	6.7 mm	17.7 mm	33.78 mm	33.78 mm	11.8 mm	24 mm
Switching Cycles:	10^4								
Switching Angle:	2 x 10°	2 x 20°	2 x 30°	2 x 30°	2 x 45°	2 x 45°	2 x 45°	2 x 45°	2 x 30°
Electrical Capacity:	24 V 100 mA								
Operating Temperature:	-10 to 55°C							+5 to 55°C	0 to 55°C
Storage Temperature:	-25 to 75°C								
Max. Series Connection on the Safety Edges:	5 Connections								
Inactive End Region:	20 mm	25 mm	20 mm	40 mm	20 mm				
Connecting Cable:	2 Conductors, 34 mm^2								

*Actuation forces and distances are tested according to EN 1760-2, Speed 200 mm/s.
*1 Maximum operating force without damaging the edge.
Specifications are subject to change without notice.

Chemical Resistance

Features	TPE*	EPDM**	NBR***
Tear Strength (Resistance)	3	3	2
Ultimate Tensile Strength	3	3	2
Rebound Elasticity at 20°C	2	2	
Resistance Against Permanent Deformation	3-4	2	
Abrasion	3	3	2
Elongation at Tear	4-5	3	3
Cold Flexibility	2	2	3
Heat Stability	4	2	2
Oxidation Stability	1	1	3
UV Stability	1	1	3
Weather/Ozone Resistance	1	1	3
Flame Resistance	6	6	6
Gas Permeability	3	4	2

KEY:
1 = very good
6 = insufficient

*TPE: Thermoplastic Elastomer
Models include: SGE-125, SGEY-365

**EPDM: Ethylene Propylene Rubber: Good resistance to ozone and weathering. Particularly suitable for aggressive chemicals
Models include: SGE-88, SGE-1510, SGE-225, SGE-245, SGE-365

***NBR: Nitrile Butadiene Rubber: Good resistance to petroleum oils, aromatic hydrocarbons, mineral oils, and vegetable oils.
Models include: SCS-2525, SCS-2540

Features	TPE*	EPDM**	NBR***
Water Resistance	1	1-2	1
Diluted Acids	1	2	3
Diluted Bases	1	2	2
Non-Oxidizing Acids	2	2	3
Oxidizing Acids	2	4	5
ASTM Oil #3	2	6	1
Vegetable Oils	1-2	5	1
Organic Solvents		2	5
Ester Solvents	2-3	2	
Ketone Solvents (Containing Oxygen)	2-3	3	5
Aliphatic Hydrocarbons (Gasoline)		5	1
Aromatic Hydrocarbons		6	2-3
Hydrogen Hydrocarbons		6	5
Hydrocarbons	2-3	5-6	
Alcohol	1	1	5

KEY:
1 = No Effects, Permanent Contact
2 = Few Effects, Some Contact
3 = Medium Effects, Some Contact
4 = Noticeable Effects, Reduced Contact
5 = Severe Effects, Very Brief Contact
6 = Extreme Effects, Avoid Contact

Force Distance

SGE-125:

Characteristic Values for Test Speed v=10 mm/s

Test Temperature	+20°C
Actuating Force Fa (N)	27.3
Actuating Distance Sb (mm)	1.8
Overtravel Distance Sv @ 250N in MM	8.3
Overtravel Distance Sv @ 400N in MM	10.6
Overtravel Distance Sv @ 600N in MM	11.5

Tested according to EN 1760-2, test unit round 80 mm, actuating point C3.

SGE-125:

Characteristic Values for Test Speed v=100 mm/s

Test Temperature	+20°C
Actuating Force Fa (N)	33
Actuating Distance Sb (mm)	1.9
Overtravel Distance Sv @ 250N in MM	10.1
Overtravel Distance Sv @ 400N in MM	11.1
Overtravel Distance Sv @ 600N in MM	12.2

Tested according to EN 1760-2, test unit round 80 mm, actuating point C3.

E

SGE-225:

Characteristic Values for Test Speed v=10 mm/s

Test Temperature	+20°C
Actuating Force Fa (N)	56.7
Actuating Distance Sb (mm)	3.9
Overtravel Distance Sv @ 250N in MM	2.3
Overtravel Distance Sv @ 400N in MM	6.7
Overtravel Distance Sv @ 600N in MM	12.0

Tested according to EN 1760-2, test unit round 80 mm, actuating point C3.

SGE-225:

Characteristic Values for Test Speed v=100 mm/s

Test Temperature	+20°C
Actuating Force Fa (N)	62.7
Actuating Distance Sb (mm)	4.4
Overtravel Distance Sv @ 250N in MM	2.7
Overtravel Distance Sv @ 400N in MM	7.2
Overtravel Distance Sv @ 600N in MM	12.0

Tested according to EN 1760-2, test unit round 80 mm, actuating point C3.

SGE-245:

Characteristic Values for Test Speed v=10 mm/s

Test Temperature	+20°C
Actuating Force Fa (N)	67.7
Actuating Distance Sb (mm)	7.4
Overtravel Distance Sv @ 250N in MM	15.8
Overtravel Distance Sv @ 400N in MM	18.3
Overtravel Distance Sv @ 600N in MM	21.7

Tested according to EN 1760-2, test unit round 80 mm, actuating point C3.

SGE-245:

Characteristic Values for Test Speed v=100 mm/s

Test Temperature	+20°C
Actuating Force Fa (N)	82.7
Actuating Distance Sb (mm)	7.8
Overtravel Distance Sv @ 250N in MM	15.2
Overtravel Distance Sv @ 400N in MM	17.7
Overtravel Distance Sv @ 600N in MM	21.9

Tested according to EN 1760-2, test unit round 80 mm, actuating point C3.

SGE-365:

Characteristic Values for Test Speed v=10 mm/s

Test Temperature	+20°C
Actuating Force Fa (N)	78.2
Actuating Distance Sb (mm)	5.16
Overtravel Distance Sv @ 250N in MM	29.82
Overtravel Distance Sv @ 400N in MM	33.78
Overtravel Distance Sv @ 600N in MM	36.51

Tested according to EN 1760-2, test unit round 80 mm, actuating point C3.

SGE-365:

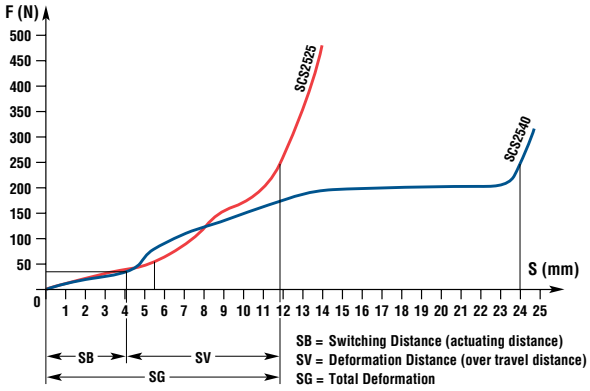
Characteristic Values for Test Speed v=100 mm/s

Test Temperature	+20°C
Actuating Force Fa (N)	107.7
Actuating Distance Sb (mm)	6.23
Overtravel Distance Sv @ 250N in MM	28.37
Overtravel Distance Sv @ 400N in MM	32.76
Overtravel Distance Sv @ 600N in MM	35.34

Tested according to EN 1760-2, test unit round 80 mm, actuating point C3.

Force Distance (continued)

SCS-2525 and SCS-2540



Bending Angles and Radii

The flat aluminum mounting channel must be prepared at the factory if it has to be bent. To order bending safety edges, please consult OMRON Automation and Safety.

Bending angles for different assembly arrangements:

Type	Bending Angle		
	A	B	C
SGE-88	45°	30°	30°
SGE-125	45°	20°	20°
SGE-1510	45°	20°	15°
SGE-225	45°	20°	30°
SGE-245	45°	10°	20°
SGE-245L	45°	10°	20°
SGE-365	45°	10°	15°

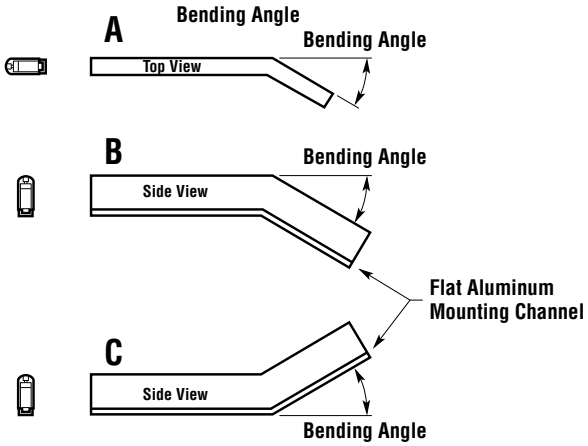


Figure 1

Notes:
By bending the safety edges, the profiles with sealing lip becomes compressed and corrugated.
Bending angle and radii are not part of the tests complying with EN1760-2 and EN12978.

Bending radii for different assembly arrangements:

Type	Bending Radius (mm)		
	Fig. 2	Fig. 3	Fig. 4
SGE-88	200	200	50
SGE-125	200	200	200
SGE-1510	200	200	200
SGE-225	300	400	200
SGE-245	400	500	200
SGE-365	800	800	500

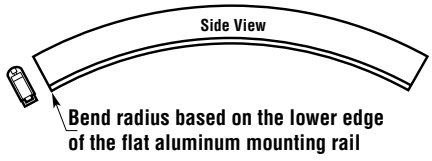


Figure 2

Flat Aluminum
Mounting Channel

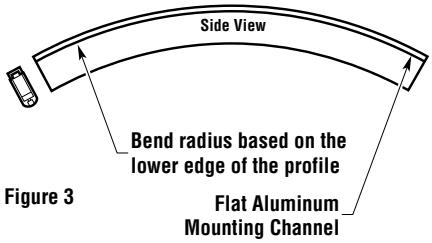


Figure 3

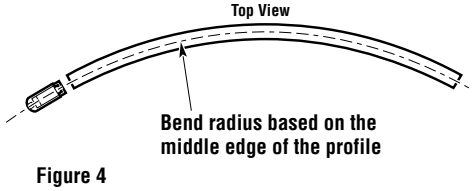


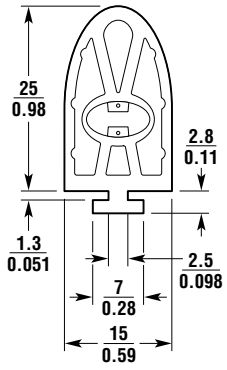
Figure 4

Dimensions

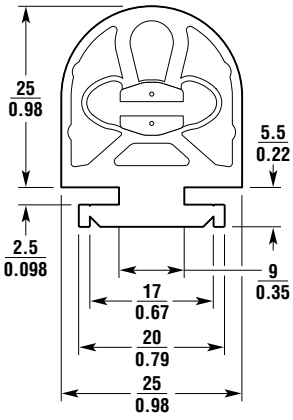
(mm/in.)

Safety Edges

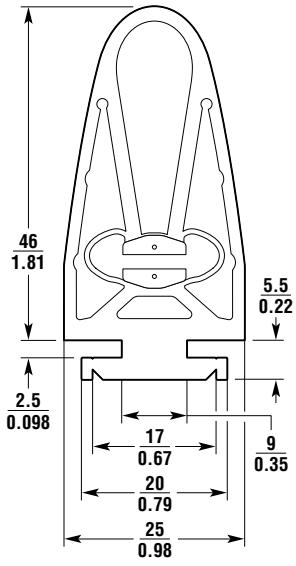
SGE-125



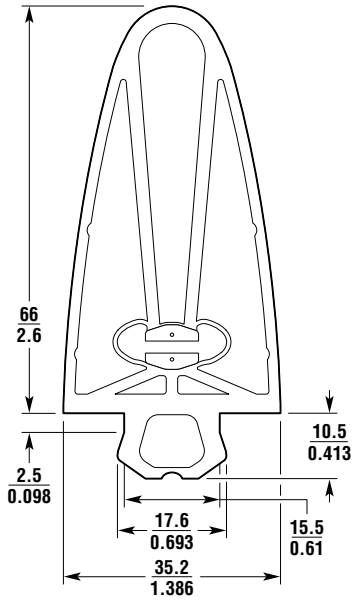
SGE-225



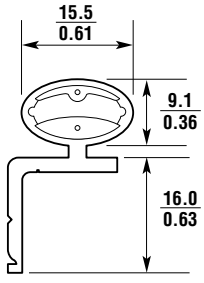
SGE-245



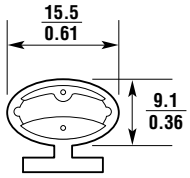
SGE/SGEY-365



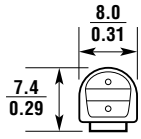
SGE-1510 with "L" Mounting



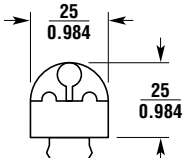
SGE-1510 with "A" Aluminum Mounting



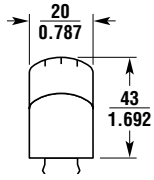
SGE-88



SCS2525

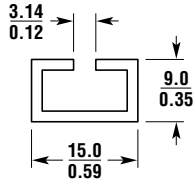


SCS2540

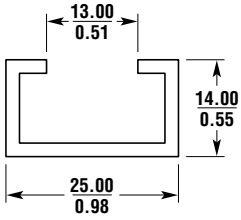


Aluminum Fastening Profiles

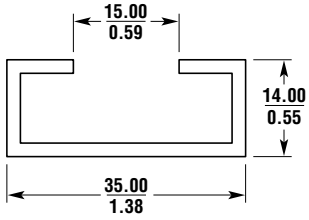
SCA-15-9
(for SGE-1510 and SGE-125)



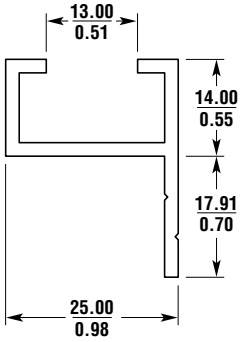
SCA-25
(for SCS/SGE-2xxx)



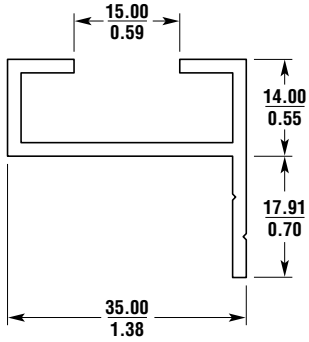
SCA-35
(for SGE-3xxx)



SCA-25L
(for SCS/SGE-2xxx)

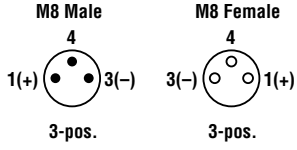


SCA-35L
(for SGE-3xxx)

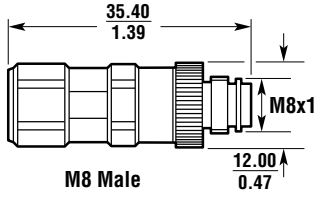


Cable Connectors

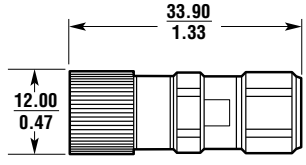
Pin Assignment



Overall Dimension:

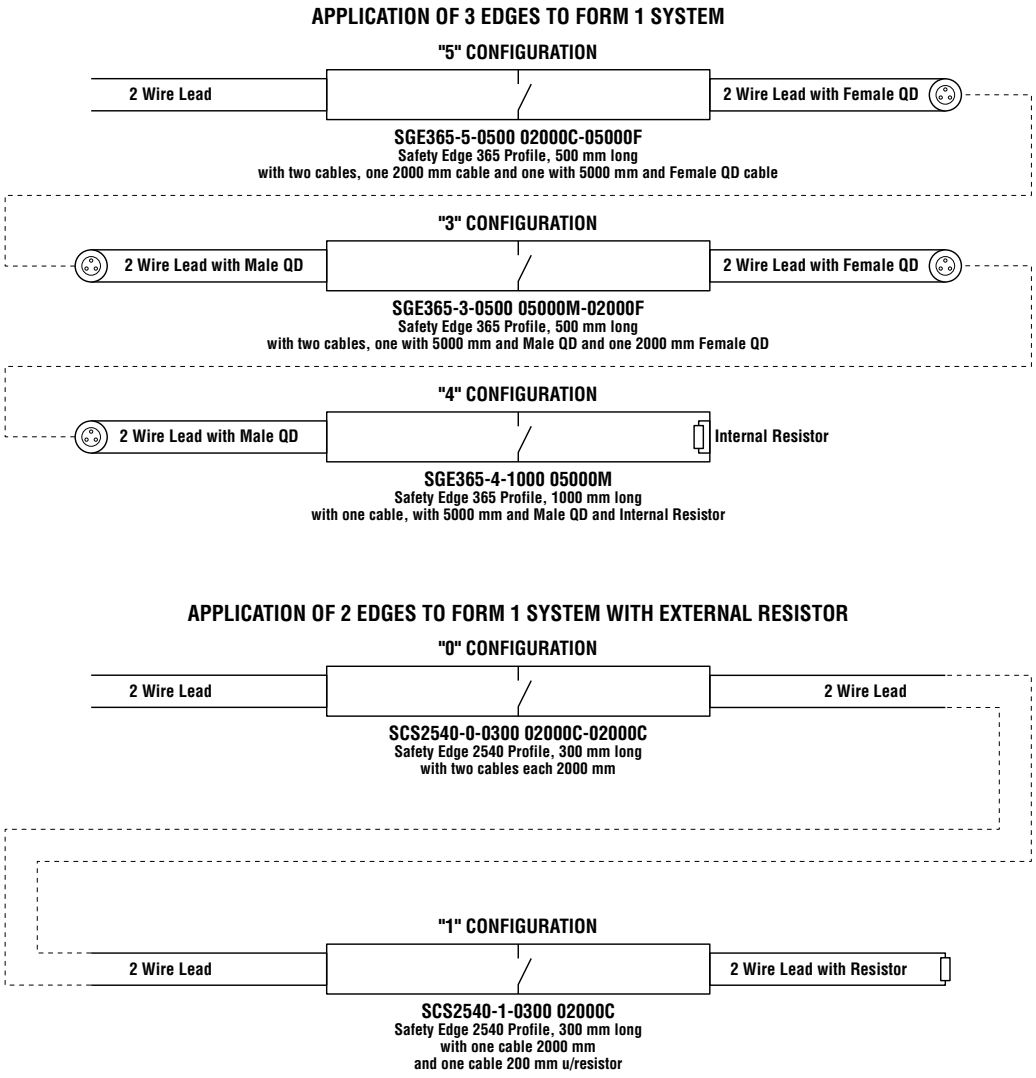


M8 Male



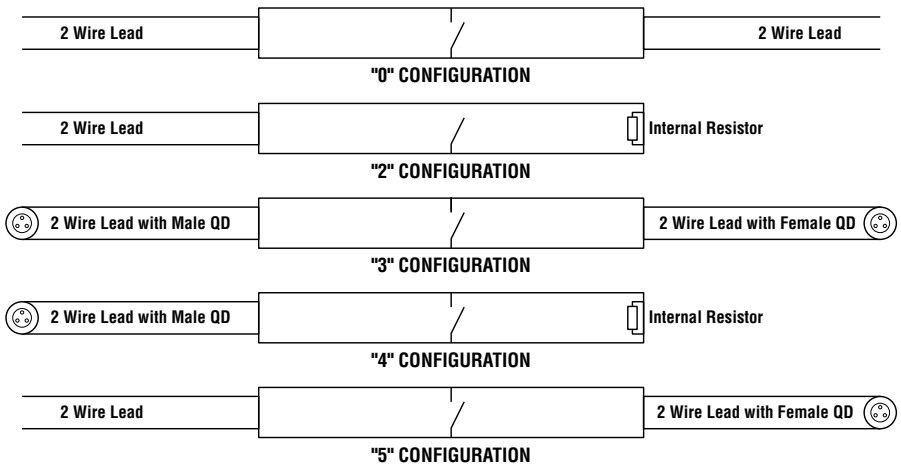
M8 Female

Typical Installation



Wiring

Available Configurations



Ordering

SGE Series

SGE – □ – □ – □ – □ – □ – □

Safety Edge Configuration*

88	8 mm x 8 mm
1510	15 mm x 10 mm
125	15 mm x 25 mm
225	25 mm x 25 mm
245	25 mm x 45 mm
245L	25 mm x 45 mm, with Sealing Lip
365	35 mm x 65 mm, black
Y365	35 mm x 65 mm, yellow

Wiring Configuration

0	Two 2-wire connections
2	One 2- wire connection and one internal resistor connection
3	One quick-disconnect male and one quick-disconnect female connector
4	One quick-disconnect male and one internal resistor connection
5	One quick-disconnect female and 2-wire connection

Length

_____ Specify length in increments of 10 mm, from 150 mm up to 6100 mm, use 4-digits

Mounting**

(blank)	Standard Mounting (all except 1510)
L	Angle aluminum mounting channel (all except 1510 and 125)
L	Rubber lip mounting for ONLY SGE-1510
A	Aluminum mounting for ONLY SGE 1510
N	No mounting channel supplied

First Cable Length

_____ Specify length in mm from 100 to 10,000 using 5 digits***
End with "C" for wiring configurations 0, 2 or 5.
End with "M" for wiring configurations 3 or 4.
Cables exit bottom of profile, except 125 that exits on right side looking at end.

Second Cable Length

_____ Specify length in mm from 100 to 10,000 using 5 digits***
End with "C" for wiring configuration 0.
End with "F" for wiring configurations 3 or 5.
Cables exit bottom of profile, except 125 that exits on left side looking at end.

SCS Series

SCS – □ – □ – □ – □ – □ – □

Safety Edge Configuration*

2525	25 mm x 25 mm (Available in NBR only)
2540	25 mm x 40 mm (Available in NBR only)

Wiring Configuration

0	Two 2-wire connections
1	One 2-wire connection and one external resistor connection
2	One 2- wire connection and one internal resistor connection
3	One quick-disconnect male and one quick-disconnect female connector
4	One quick-disconnect male and one internal resistor connection
5	One quick-disconnect female and 2-wire connection

Length

_____ Specify length in increments of 10 mm up to 6100 mm, use 4-digits

Mounting**

(blank)	Standard Mounting
L	Angle aluminum mounting channel
N	No mounting channel supplied

First Cable Length

_____ Specify length in mm from 100 to 10,000 using 5 digits***

Second Cable Length

_____ Specify length in mm from 100 to 10,000 using 5 digits***

* Standard material for most configurations is EPDM (Exception: Standard material for the SGE-125 and SGEY-365 are TPE; SCS-2525; and SCS-2540 are available in NBR only).
** Angle mounting channel is available for all profiles except the SGE-125 and SGE-1510
*** Examples: SGE-125-2-0150 05000C
SGE-125-3-0150 05000M-05000F
150 mm cable with Male QD = 00150M
**** For non-standard cable exit contact factory

For information on Safety Edge Controllers, see page E-11