

# Safety Sensitive Edges

## Based on Optoelectronic Technology

FF-SD Series

### FEATURES

- Sensor based on optoelectronic technology
- Meets European EN 1760-2 standard for Pressure Sensitive Protective Devices
- Permanent self-checking electronic designed in compliance with the requirements of the EN 954-1 standard for Category 4 Protective Devices
- Protected length: from 0,4 m to 10 m / 1.31 ft to 32.8 ft
- High resistance to environmental influences
- Robust against mechanical damage
- Sensors sealing: IP 68
- Unique gain compensation system that accommodates ingress of dust or moisture inside the profile
- Low actuating force and high over-travel
- Supply voltage: 24 Vdc
- Response time of the control unit: 0,032 s
- Automatic or manual restart
- LED status indicator
- DIN rail mount 22,5 mm / 0.88 in width control unit

### TYPICAL APPLICATIONS

- Industrial doors (sectional doors, sliding doors, etc.)
- Machine guards and doors
- Auto Guided Vehicle
- Lifting decks and elevation platforms
- Automatic handling systems or manipulators (robots, material feeding systems, etc.)



The Honeywell FF-SD Safety Sensitive Edge is a pressure sensitive protective device designed in compliance with the requirements of the EN 1760 part 2 European Standard for protection of operators exposed to hazardous moving parts.

Each safety edge system is made up of an emitter and a receiver, a rubber profile mounted on a aluminium rail and a control unit. The complete system is designed in compliance with the requirements of the EN 954-1 European Standard for Category 4 Protective Devices and therefore can be used in the most dangerous applications.

The sensors use a pulsed infrared light beam and an electrical cable link to achieve a dynamic monitoring concept with a single control unit. If the light beam is attenuated or if the cable is damaged or broken, the control unit de-energises its safety output relays.

The Safety Sensitive Edges can be easily adapted to different lengths thanks to the electronic sensors which automatically adjust the scanning range to the length of the protected area.

The Safety Sensitive Edges can protect from 0,4 m to 10 m / 1.31 ft to 32.8 ft length.

The industrial rubber profile provides excellent chemical and mechanical resistance. The system can still operate with a cut or damaged profile. The rubber profile can be easily and quickly replaced. The complete sensor unit, with an IP 67 sealing, can be used in hard industrial environments (exceptions are exproof area or underwater applications).

The safety control unit with its 22,5 mm / 0.88 in width will find easily a place inside the cabinet and can be placed up to 200 m / 656 ft away from the Safety Sensitive Edge.

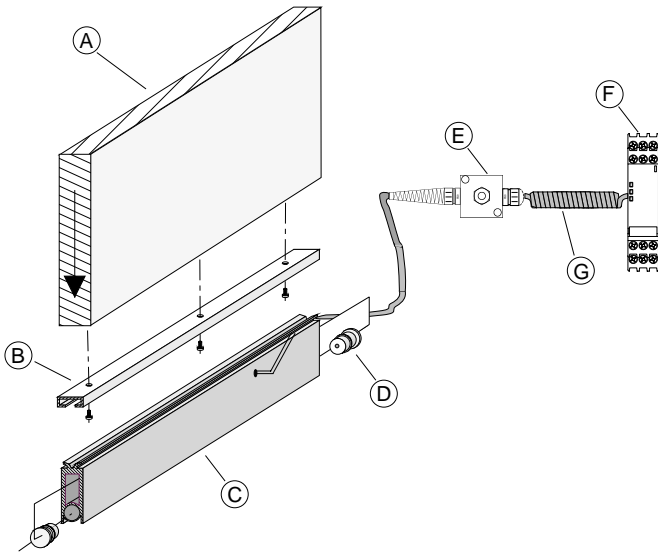
### **WARNING**

#### MISUSE OF DOCUMENTATION

- The information presented in this product sheet (or catalogue) is for reference only. DO NOT USE this document as system installation information.
- Complete installation, operation and maintenance information is provided in the instructions supplied with each product.

**Failure to comply with these instructions could result in death or serious injury.**

## Ordering information



### Safety Sensitive Edge System

- A Moving part
- B Aluminium rail
- C Rubber profile
- D Sensors
- E Junction box (optional)
- F Control unit
- G Coil cord (optional)

### Selection of a Safety Sensitive Edge

The Safety Sensitive Edge is used to protect people from being crushed by a moving part. In order to select the right Safety Sensitive Edge system, several parameters are required:

- Which safety category according to EN 954-1 does the application require ?
- What is the speed of the hazardous movement ?
- What is the distance travelled by the moving part when a stop signal is sent to the control unit ?
- What are the expected environment specifications of the profile: e.g. the chemical resistance.

### Choice of equipment

The minimum overtravel required by the safety edge is determined from the measured or given stopping travel at maximum operating speed. The EN 1760-2 standard recommends a safety factor of at least 1.2 times the minimum distance.

If the application involves extremely frequent actuation, care should be taken to choose a profile that recovers its original shape as quickly as possible. Attention must also be paid to the construction of the opposite edge.

When the stopping travel and speed are known, the force-travel diagrams of the safety edges can be used to select the safety device with the required overtravel and the required operating speed.

The stopping response of the machine may have to be improved if a device with sufficient overtravel is not available.

### Installation of the FF-SD

The aluminium rail is mounted on the moving part of the machine. To fix it, drill a hole approximately every 70 mm / 2.76 in distance and fix it to the application with the use of head or countersunk head screws (diameter 3 mm to 6 mm / 0.11 in to 0.23 in).

The surface should be plain and clean.

The maximum length of the aluminium rail is 2,5 m / 8.2 ft. For lengths over 2,5 m / 8.2 ft, several units with standard size have to be mounted. Care must be taken that neither misalignment nor bends occur (do not exceed 30°).

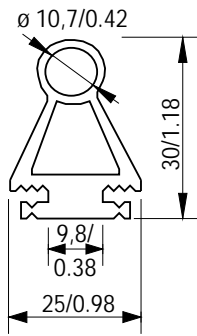
Slide or clip the sensor profile into the rail. If the safety sensitive edge is mounted vertically, the profil has to be fixed to avoid slipping off the aluminium rail.

The sensors can be wired to the control unit directly or through the junction box. The coil cord is used when the door's motion can damage the cable (version A2). The B2 cable version (polyester coated wires for better flexibility) can also be used for this type of application.

**Dimensions of a complete safety sensitive edges system**

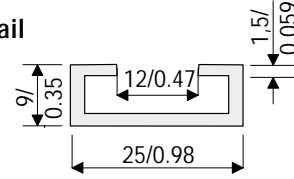
**FF-SDZPR2530**

Rubber profile



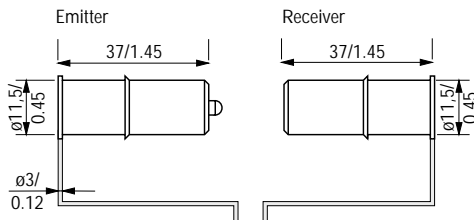
**FF-SDZRA2509**

Aluminium rail



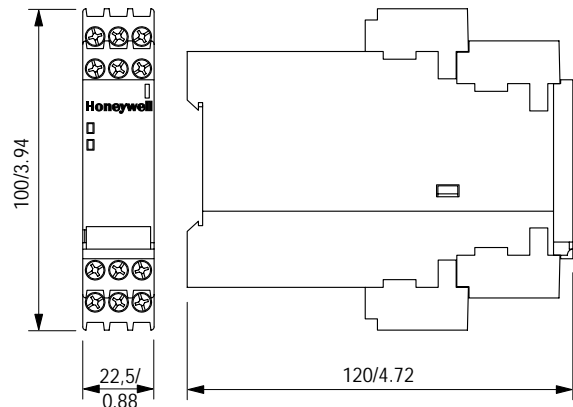
**FF-SDER11A2**

Safety Sensors



**FF-SDC100R2**

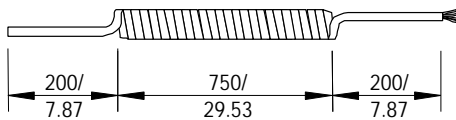
Safety Control Unit



**Accessories**

**FF-SDZCOILA**

Coil cord

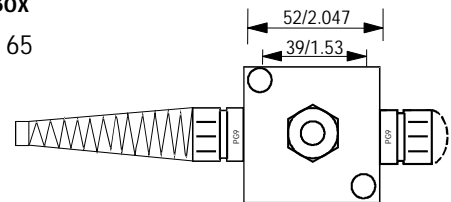


The coil cord is used as a flexible connection between the junction box mounted on the moving part and the control unit. The maximum cable extension is 3 meters.

**FF-SDZJUNCA**

Junction Box

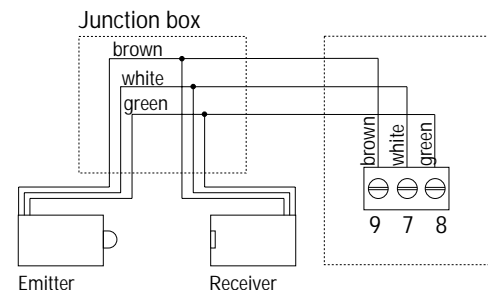
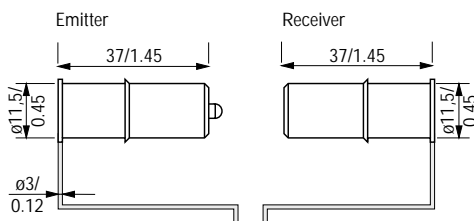
Sealing: IP 65



It is used to as a cable connection between emitter / receiver and the control unit.

**FF-SDER11B2**

Shield cable for EMC issue or long distance wiring.



# FF-SD

- Pressure sensitive protective device in compliance with the requirements of the EN 1760-2 standard
- Safety Sensitive Edge in compliance with the requirements of the EN 954-1 for Category 4 equipment



Dimensions in millimeters / inches, meters / feet, weights in kg / lbs

<b>Features</b>		
Emitter / receiver	Material	Polyethylene
	Scanning range	0,4 m to 10 m / 1.31 ft to 32.8 ft
	Emission	IR light: 950 nm
	Voltage	12 Vdc (supplied by the control unit)
	Operating temperature	-20 °C to +75 °C / -4 °F to 167 °F
	Connection to the control unit	Polyurethan/polyvinylchlorid 3 x 0,14 mm <sup>2</sup> acid and oilproof, cold resistant, notch-proof
	Max. cable length	200 m / 656 ft from the junction box to the control unit
	Sealing	IP 68
	Length of the sensors cable	Emitter: 10,5 m / 34.44 ft • Receiver: 3 m / 9.84 ft
	Cable material	PUR 3 x 0,15 mm <sup>2</sup>
<b>Rubber profile</b>	Material properties	International marking EPDM (APTK)
	Chemical marking	Ethylen-Propylen-Ter-Polymer
	Resistance against permanent deformation	Good
	General weatherproofness	Excellent
	Ozone resistance	Excellent
	Oil resistance	Poor
	Fuel resistance	Poor
	Chemical solvent resistance	Poor to satisfying
	General resistance against acids	Good
	Temperature resistance	Short term approx. -50 °C to +170 °C / -58 °F to 338 °F
		Long term approx. -30 °C to +140 °C / -22 °F to 284 °F
		Weight/m 0,3 kg/m / 0.66 lb/m
<b>Control unit</b>	Category	Category 4 according to EN 954-1
	Supply voltage	24 Vdc -10 % to +20 %
	Power consumption	Max. 4 W
	Response time	0,032 s
	Output	2 NO contacts (2 safety relays with guided contacts, max. voltage 4 A and 250 Vac/dc) + 1 NO (static non safety output)
	Restart	Manual or automatic
	Sealing	IP 40 housing, IP 20 terminal block
	Mounting	DIN rail
	Weight	0,2 kg / 0.44 lbs
	LED indicators	Power and channel
<b>General data of the sensing edge</b>	Temperature range	5 °C to 55 °C / 41 °F to 131 °F
	Protection class	IP 67
	Length	0,4 m to 10 m / 1.31 ft to 32.8 ft
	Tolerable weight	500 N on any point of the effective sensing surface
	Operating speed	Min.: 10 mm/s, max.: 100 mm/s (test values of the BG)
	Install position	Any position

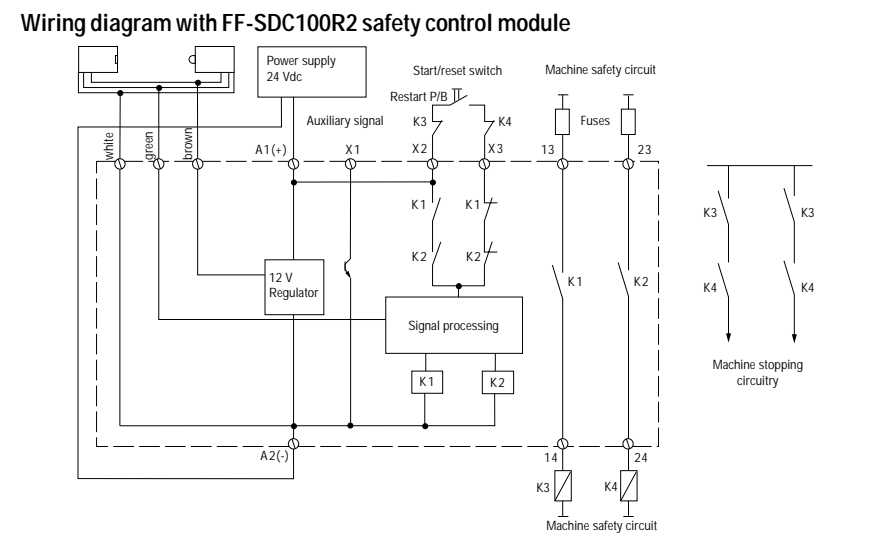
**Ordering information**  
 Safety sensors: (E: emitter / R: receiver)  
**FF-SDER11A2 or FF-SDER11B2**  
 Note: The FF-SD□□□□A2 version is recommended when the sensor cable is fixed. The FF-SD□□□□B2 version has polyester coated wires inside the sensor cable for better flexibility, and is recommended in applications where the sensor cable is moving.  
**Rubber profile:**  
 FF-SDZ PR 2530

**Dimensions**  
 01: 1 m / 3.28 ft  
 25: 2,5 m / 8.2 ft  
 05: 5 m / 16.4 ft  
 10: 10 m / 32.8 ft

**Aluminium rail:**  
 FF-SDZ RA 2509

**Dimensions**  
 01: 1 m / 3.28 ft  
 25: 2,5 m / 8.2 ft

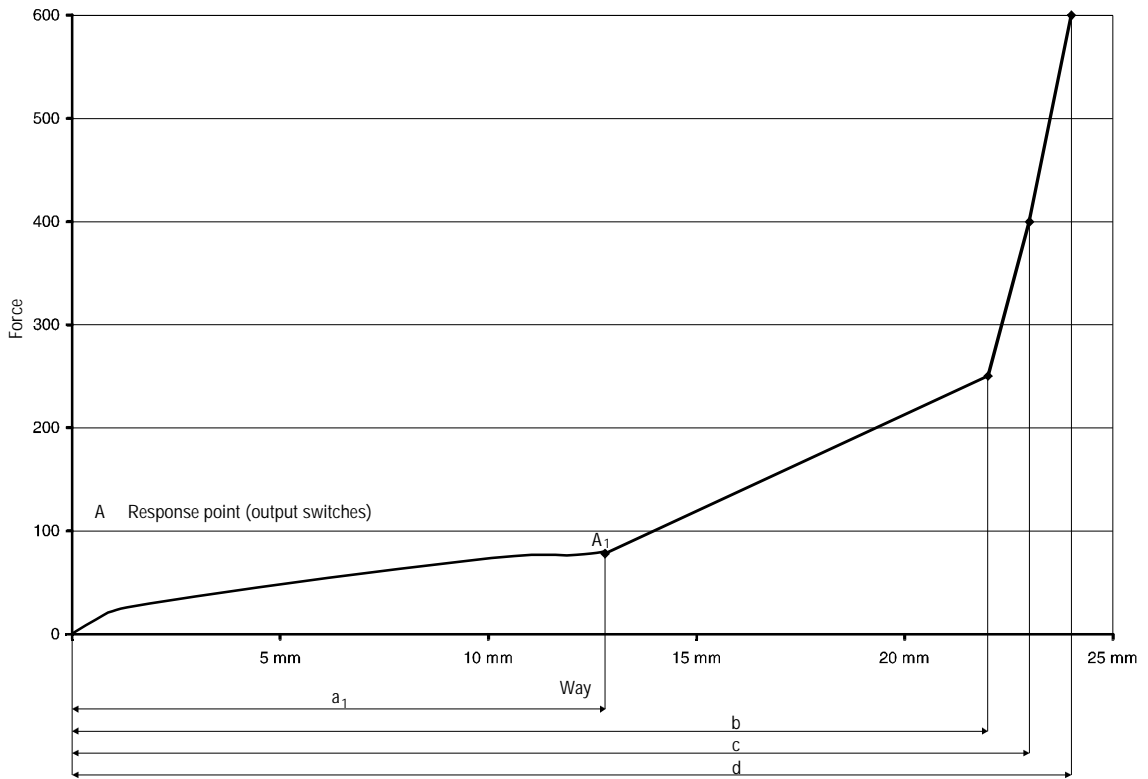
**Safety control unit:** FF-SDC100R2



FF-SD

**Profile characteristics: FF-SDZPR2530□□**

**Force travel relation**



Measured at:

- Temperature: T = 23 °C
- Install position: B (to EN 1760-2)
- Measuring point: C3 (to EN 1760-2)
- Speed: 100 mm/s to A  
10 mm/s from A

	Travel	Force
a1	12,8 mm / 0.50 in	80 N
b	22 mm / 0.87 in	250 N
c	23 mm / 0.9 in	400 N
d	24 mm / 0.94 in	600 N

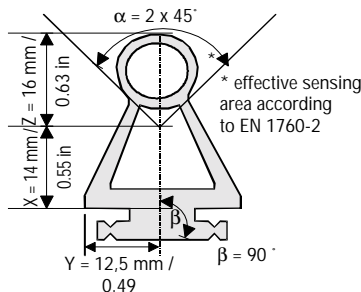
**Measurements:**

a<sub>1</sub> = pretravel

b/c/d = total travel to reach the force x

a<sub>1</sub>-b/c/d = overtravel

**Effective sensing surface of FF-SDZPR2530□□**



The low sensing surface at ends (70 mm) should not be used as detection surface.  
 The highest actuating force applied on any point of the effective sensing surface should be less than 500 N.  
 The finger detection is possible.

**FF-SD**

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While we provide application assistance, personally, through our literature and the Honeywell web site, it is up to the customer to determine

the suitability of the product in the application.

Specifications may change at any time without notice. The information we supply is believed to be accurate and reliable as of this printing. However, we assume no responsibility for its use.

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