

# TECHNICAL DATA SHEET

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## SAFETY EDGES SENSOR DB-PSE series



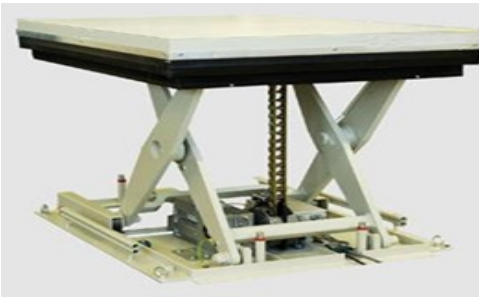
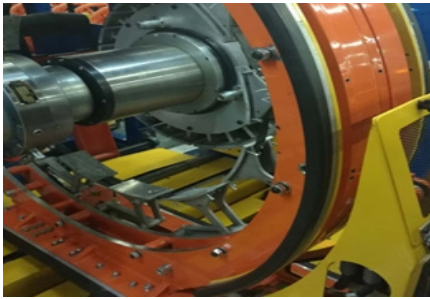
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## Product application

The safety edge is a pressure-sensitive sensor in the form of a rubber band. Used to detect hazards such as crushing or shearing of people by moving parts. It is a close-up safety protection device for automatic equipment, which meets the highest safety protection requirements and is used to ensure the safety of people in dangerous areas that may be caught, squeezed, and bumped.



## Features

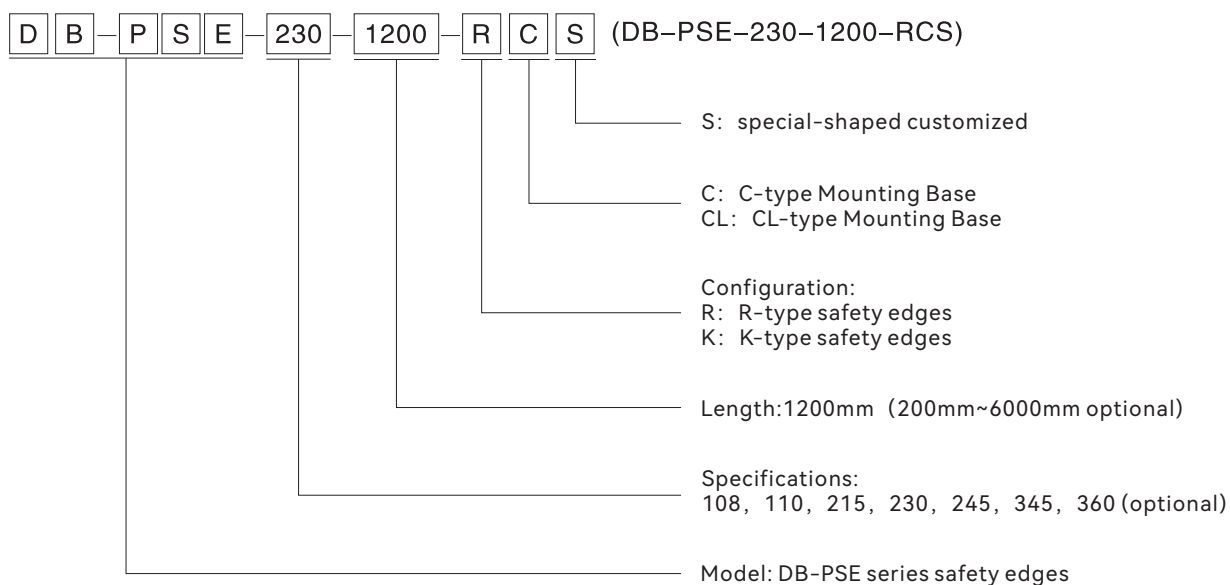
- High trigger sensitivity, strong reliability, in line with the highest safety standards;
- Small size, suitable for use in narrow spaces;
- Can be installed with the type, according to the user's requirements, it can be applied to the anti-pinch protection occasions of circular arc or other shapes;
- Protection class IP65; meet extreme weather conditions, suitable for indoor or outdoor installation;
- It is suitable for various complex industrial occasions, and products with special requirements such as oil resistance and acid and alkali resistance can be selected.

The safety edge and the matching safety relay form a control area. Each control unit can be a safety edge, or multiple safety edges connected in series to form a control area. Series use of safety edges Up to several safety edges can be connected in series. But the maximum length of a control area (including link cables) should not be greater than 100 meters.

## Usage restrictions

The safety edge and the matching safety relay form a control area. Each control unit can be a safety edge, or multiple safety edges connected in series to form a control area. Series use of safety edges Up to several safety edges can be connected in series. But the maximum length of a control area (including link cables) should not be greater than 100 meters.

## The specifications of DB-PSE series safety edges are as follows:

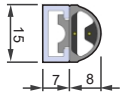
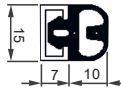
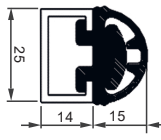
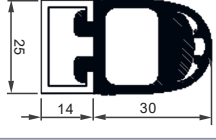
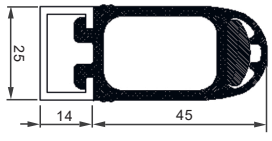
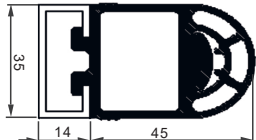
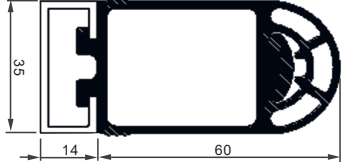


## 1. Product model specification

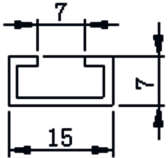
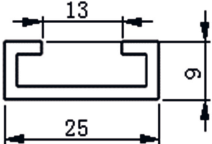
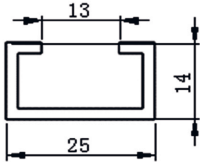
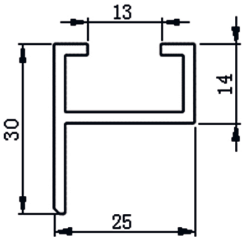
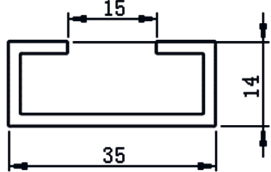
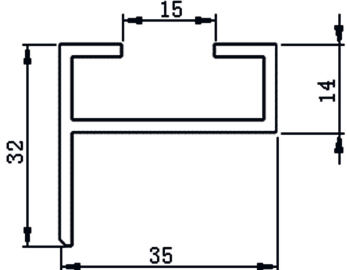
- Trigger distance - the distance from touching the safety edge to the trigger signal of the safety edge.
- Overtravel - the distance from the output of the safety edge trigger signal to the end of the safety edge buffer.

| Model      | Dimensions | Trigger distance | Trigger force | Overtravel |
|------------|------------|------------------|---------------|------------|
| DB-PSE-108 | 8mm*15mm   | < 2mm            | ≤25N          | 0          |
| DB-PSE-110 | 10mm*15mm  | < 2mm            | ≤25N          | 0          |
| DB-PSE-215 | 15mm*25mm  | < 3mm            | ≤25N          | 0          |
| DB-PSE-230 | 30mm*25mm  | < 3mm            | ≤25N          | < 19mm     |
| DB-PSE-245 | 45mm*25mm  | < 3mm            | ≤25N          | < 30mm     |
| DB-PSE-345 | 45mm*35mm  | < 5mm            | ≤100N         | < 30mm     |
| DB-PSE-360 | 60mm*35mm  | < 5mm            | ≤100N         | < 45mm     |

## 2. Boundary dimensions of safety edges

| Model      | Outline Dimensional   | Sheathing material | Applications   |
|------------|---|--------------------|--|
| DB-PSE-108 |    | TPE                | Small AGV  |
| DB-PSE-110 |   | TPE                | Small AGVs, garage access control, industrial applications, etc  |
| DB-PSE-215 |  | EPDM               | AGV, electric door<br>Industrial applications  |
| DB-PSE-230 |  | EPDM               | AGV, electric door<br>Industrial applications  |
| DB-PSE-245 |  | EPDM               | AGV, electric door<br>Industrial applications  |
| DB-PSE-345 |  | EPDM               | Large AGV anti-collision,<br>heavy-duty industrial doors,<br>machinery,<br>and industrial applications |
| DB-PSE-360 |  | EPDM               | Large AGV anti-collision,<br>heavy-duty industrial doors,<br>machinery,<br>and industrial applications |

### 3. Boundary dimensions of safety contacts

| Base specifications | Overall dimensions  | Applicable model   |
|---------------------|---|--|
| 15mm C-type base    |    | Suitable for DB-PSE-108, DB-PSE-110 series safety edges                |
| 25mm C-type base    |    | Suitable for DB-PSE-215, DB-PSE-230 and DB-PSE-245 series safety edges |
| 25mm C-type base    |    | Suitable for DB-PSE-215, DB-PSE-230 and DB-PSE-245 series safety edges |
| 25mm CL-type base   |   | Suitable for DB-PSE-215, DB-PSE-230 and DB-PSE-245 series safety edges |
| 35mm C-type base    |  | Suitable for DB-PSE-345, DB-PSE-360 series safety edges                |
| 35mm CL-type base   |  | Suitable for DB-PSE-345, DB-PSE-360 series safety edges                |



## 4. Function type

| R-type safety edges  | K-type safety edges  |
|--|--|
| <p>R-type<br/>With terminal resistance</p> <p>Aluminum bracket</p> <p>Signal cable</p>   | <p>K-type<br/>no terminating resistor</p> <p>Aluminum bracket</p> <p>Signal cable</p>  |
| <p>TPE sheathed cable VVR <math>\phi 4\text{mm}</math> <math>2 * 0.35\text{mm}^2</math> (Red/black core)<br/>Cable length 2 meters, encapsulated terminal resistance (R=1.2K<math>\Omega</math> or 8.2 K<math>\Omega</math>)</p> | <p>TPE sheathed cable VVR <math>\phi 4\text{mm}</math> <math>2 * 0.35\text{mm}^2</math> (Red/black core)<br/>Cable length 2 meters</p> |

## 5. Effective length

The length of the safety edge is generally 200mm~6000mm. There is a non-inductive zone at both ends of the safety contact edge.

|  |                       |
|--|-----------------------|
| <p>Non-sensing area</p> <p>Effective length</p> <p>Non-sensing area</p> <p>Safety edges</p> <p>Aluminum bracket</p> <p>Signal cable</p> <p>Safety edges length</p> |                       |
| TPE sheath type  | EPDM sheath type      |
| Non-sensing area 20mm  | Non-sensing area 25mm |

## Technical data

| Basic data                  |  |
|-----------------------------|--|
| Product model               | DB-PSE series                                      |
| Detection method            | Pressure sensing method                            |
| Maximum sensing angle       | <90°   |
| Trigger force               | ≥ 25N-250N (according to specifications and usage) |
| Mechanical life             | > 3000000 times                                    |
| Surface protection material | EPDM rubber Cr rubber                              |
| Ambient temperature         | -20 °C --+55 °C                                    |
| Protection level            | IP65   |
| Maximum humidity (23 %RH)   | 95% (condensation)                                 |
| Response time               | 13ms   |

| Security classification    |                                     |
|----------------------------|-------------------------------------|
| EN1760-1: Reset command    | Support                             |
| ISO 138491-1:2005          | Classification 3                    |
| MTTF <sub>d</sub>          | >30 years                           |
| B <sub>10d</sub>           | 3* 10 <sup>7</sup>                  |
| N <sub>op</sub> (accepted) | 52560/year                          |
| IEC 61508: PFHs            | 6.99 * 10 <sup>-10</sup> 1/h (SIL3) |

The safety contact system composed of DB-PSE type safety contacts and QSRN, Ter-A type safety relays meets the following standards: EN1760-2; ISO13856-2; EN62061; EN ISO13849-1; IEC61508; EN60204-1.

## 1. Safety edge custom standard

| Safety edge jacket material | Model                             |
|-----------------------------|-----------------------------------|
| TPE                         | DB-PSE-108 and 110 seires         |
| EPDM                        | DB-PSE-215/230/245/345/360 seires |
| SBR, CR, NBR                | Custom made                       |
| Operating temperature       | -20°C ~ +55°C                     |
| Safety standard             | EN1760-2                          |
| Degree of protection        | IP65                              |

## 2. Safety Edge Physical Properties

| Material                       | EPDM      | TPE       |
|--------------------------------|-----------|-----------|
| Tear strength                  | Better    | Better    |
| Ultimate tensile strength      | Good      | Better    |
| Resilience (20°C)              | Good      | Good      |
| Plastic deformation resistance | Good      | Generally |
| Wear and tear                  | Better    | Better    |
| Extendable length              | Generally | Generally |
| Low temperature elasticity     | Good      | Good      |

### 3. Safety Edge chemical barrier

| Solution name         | EPDM | TPE |
|-----------------------|------|-----|
| Dilute acid           | +    | +   |
| Dilute alkali         | +    | +   |
| Non-oxidizing acid    | +    | ±   |
| Metal working oil     | ±    | ±   |
| Vegetable oil         | +    | +   |
| Ester solvent         | +    | ±   |
| Solvent (gasoline)    | ±    | -   |
| Aromatic hydrocarbons | -    | -   |
| Alcohol               | +    | +   |
| Ammonia               | +    | ±   |
| Brake fluid           | +    | +   |
| Cutting emulsion      | +    | +   |
| Acetic acid           | +    | ±   |
| Acetone               | +    | ±   |
| Potash fertilizer     | +    | +   |
| Methanol              | +    | ±   |
| Thinner               | -    | -   |
| Water                 | +    | +   |

### 4. Safety Edge environmental tolerance

| Material                   | EPDM      | TPE       |
|----------------------------|-----------|-----------|
| high temperature stability | Very good | Generally |
| Oxidative stability        | Very good | Very good |
| UV stability               | Very good | Very good |
| Climate/ozone resistant    | Very good | Very good |
| Gas permeability           | Very good | Very good |
| Flame retardancy           | Good      | bad       |

## Installation instructions

### 1. Safety edge installation features

If the installation angle is larger than the maximum bending angle, the safety way of safety touch edge segmented series connection can be considered.



The safety edge can be bent and installed at a certain angle, and the maximum allowable bending angle is shown in the table below.

| Maximum bending angle |     |     |     | Image |
|-----------------------|-----|-----|-----|-------|
| Model                 | A   | B   | C   |       |
| DB-PSE-108            | 20° | 20° | 15° |       |
| DB-PSE-110            | 20° | 20° | 15° |       |
| DB-PSE-215            | 20° | 20° | 20° |       |
| DB-PSE-230            | 20° | 20° | 15° |       |
| DB-PSE-245            | 15° | 15° | 10° |       |
| DB-PSE-345            | 15° | 15° | 10° |       |
| DB-PSE-360            | 15° | 15° | 10° |       |

The safety contact edge can be installed and used in a circular arc shape, and the allowable minimum bending radius is shown in the table below.

| Minimum bending radius (mm) |     |     |     | Image |
|-----------------------------|-----|-----|-----|-------|
| Model                       | R1  | R2  | R3  |       |
| DB-PSE-108                  | 200 | 300 | 50  |       |
| DB-PSE-110                  | 200 | 350 | 150 |       |
| DB-PSE-215                  | 350 | 350 | 150 |       |
| DB-PSE-230                  | 350 | 450 | 300 |       |
| DB-PSE-245                  | 350 | 450 | 450 |       |
| DB-PSE-345                  | 400 | 450 | 450 |       |
| DB-PSE-360                  | 400 | 500 | 450 |       |

## 2. Selection of safety edges controller

| Name         | Order separately  | Model | Descriptions  |
|--------------|---|-------|---|
| Safety relay |  <br>Multifunction switching switch | Ter-A | Equipped with a mode switch, it can be used for most safety components, such as light curtains, safety switches, carpet contacts, two handed switches, etc. Automatic/manual reset paddles for quick configuration. Dual channel monitoring circuit, safe and reliable. |

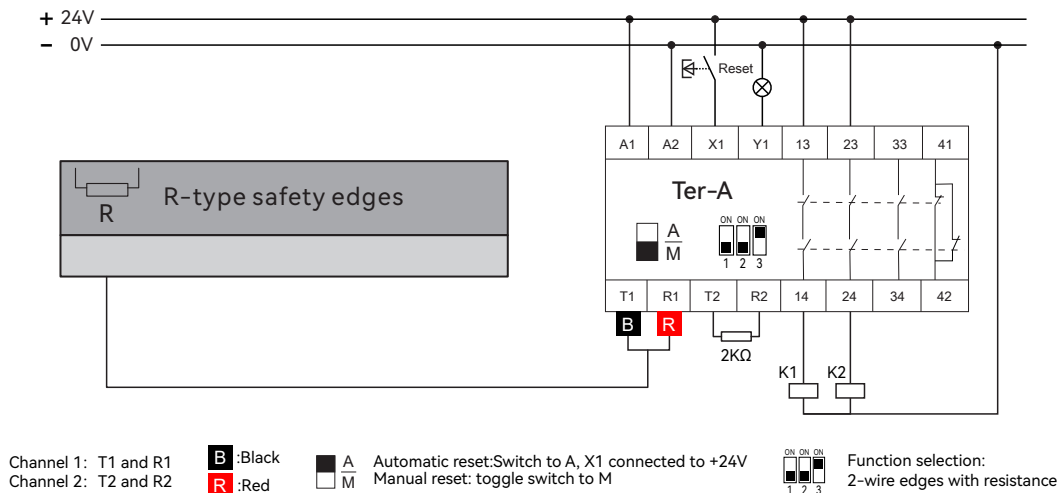
### 2.1 security touch system configuration

#### System configuration of sensor mode safety relay

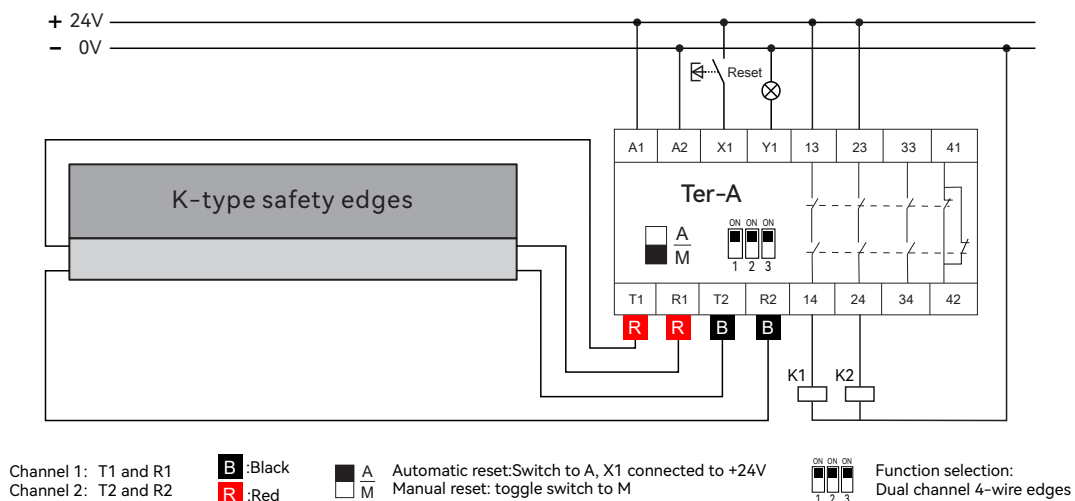
The safety contacts and safety relays form a complete safety protection system. According to the requirements, a protection system can be composed of a safety relay with one safety contact, multiple safety contacts, or a series combination of safety contacts and safety carpets to form a safety protection system.

1) Sensing output -1 safety contact safety protection system:

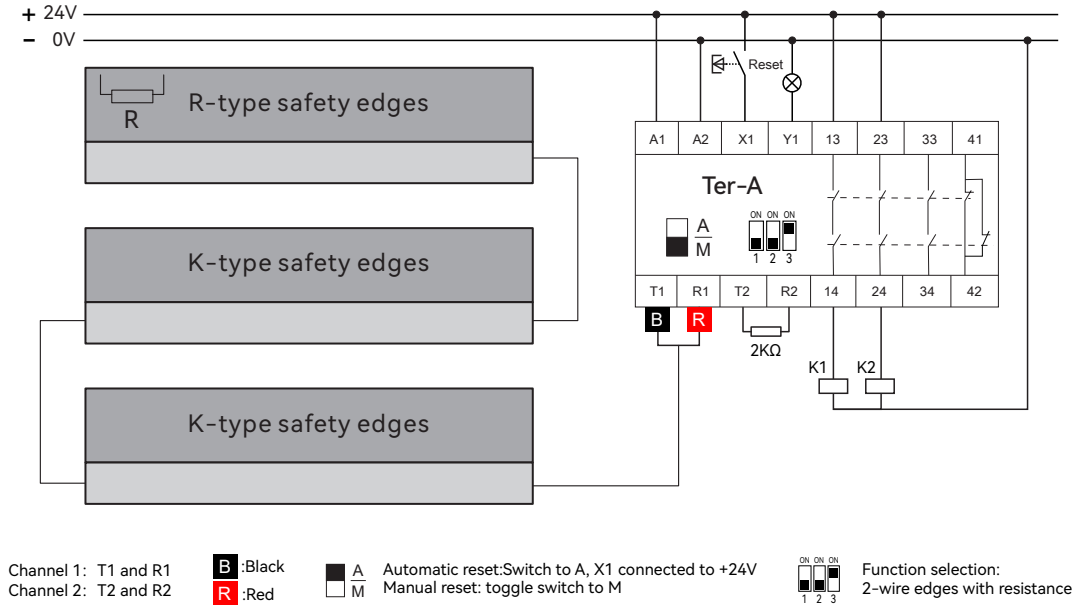
a. 2-wire edges connected relay Ter-A safety input with manual reset



b. Dual channel 4-wire edges connected relay Ter-A safety input with manual reset

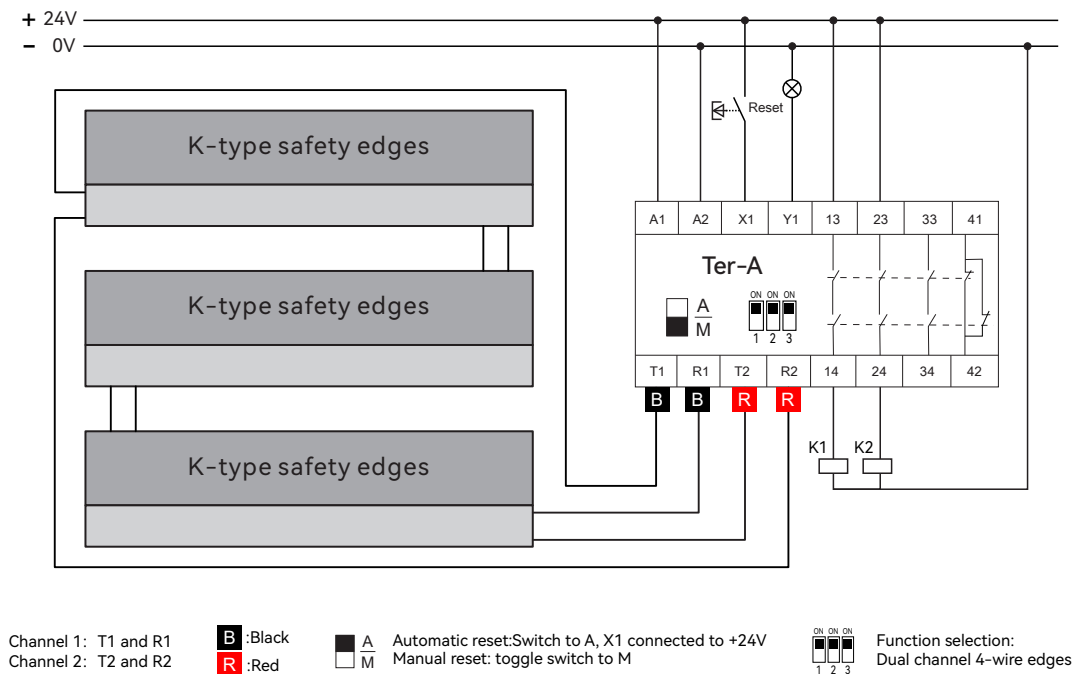


2) Sensing output – a combination of multiple safety edges connected in series  
R/K series combination of safety edges



3) K/K series combination of safety edges

This combination is generally used for safety protection systems with multiple safety edges in sensor output mode, single zone Control multiple safety edge situations. This series connection can be used with up to 10 safety edges in series.



## Precautions

### 1. Precautions for storage and use environment

- Do not store or use this product under long-term direct sunlight;
- Do not store and use the ambient temperature outside the range of -35°C to +80°C;
- Do not store and use outside the air pressure range of 86~106KPa;
- Do not store and use in environments containing strong corrosive or flammable gases.

### 2. Precautions for installation

- Do not lift or move the safety edge by pulling on the cable ;
- Please use the special bracket to install the safety edge ;
- Do not fold or punch holes in the safety edge ;
- Do not install the Safety Edge on raised areas of the surface, but on a flat, smooth surface.

### 3. Precautions for use

- Be sure to use the safety edge with the matching safety relay in this instruction ;
- The safety edge cannot be directly connected to the switch contacts of ordinary intermediate relays for use;
- It is not possible to connect the safety edge directly to the PLC for use;
- Do not apply load to a certain position of the safety edge for a long time, otherwise it may cause damage to the safety edge;
- Do not immerse the safety edge in water or use it in frequent water splashing;
- Please use it strictly according to the chemical resistance of the product.