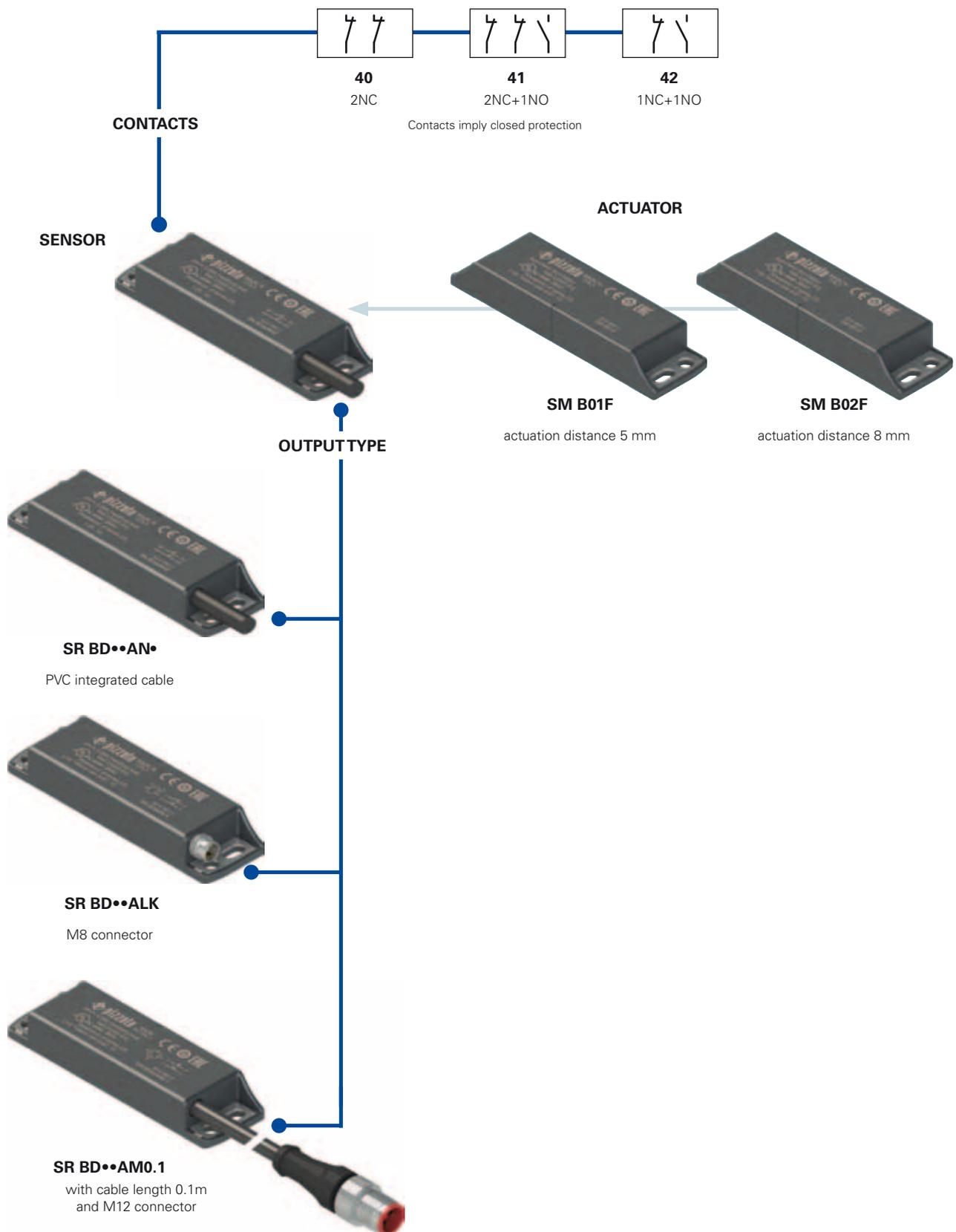


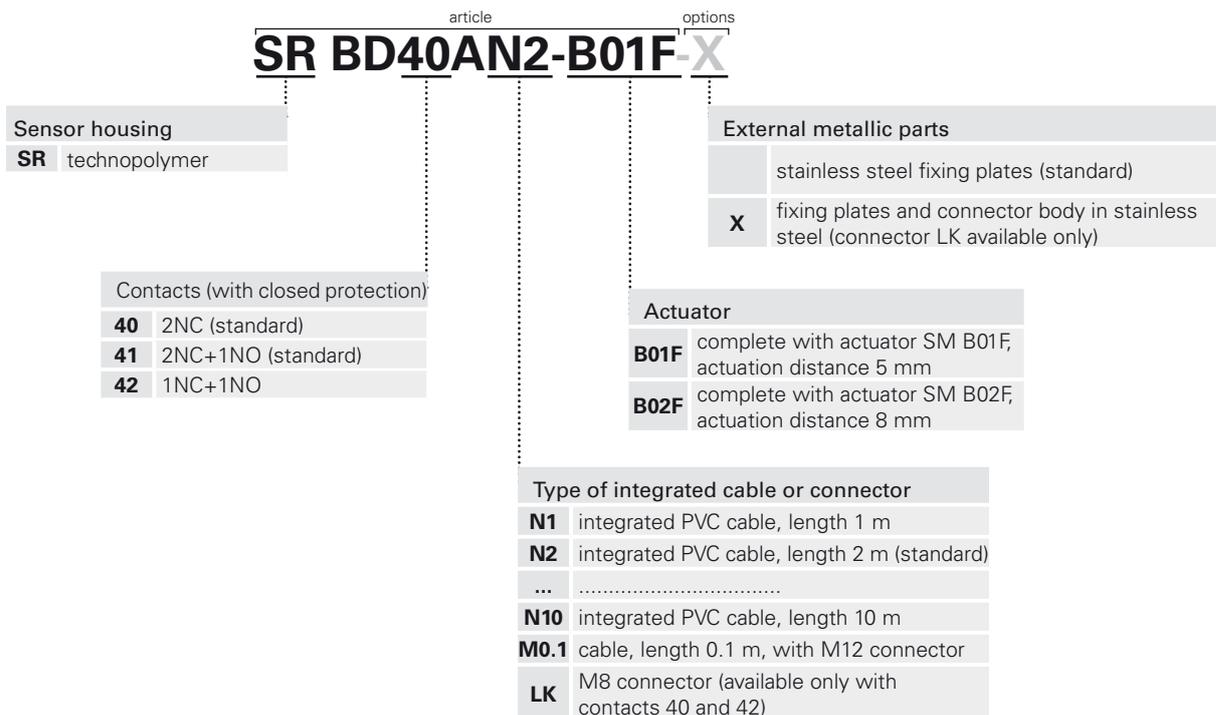
Selection diagram



● product option  
→ accessory sold separately

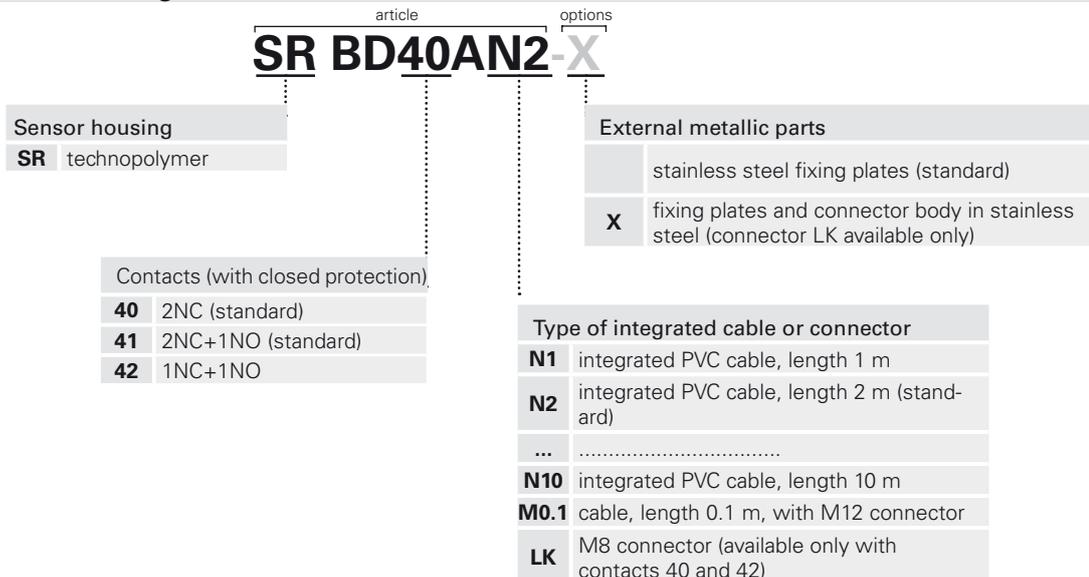


### Code structure for sensor with actuator



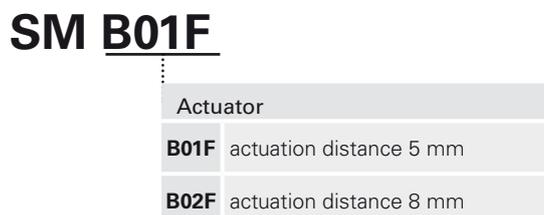
**Attention!** The feasibility of a code number does not mean the effective availability of a product. Please contact our sales office.

### Code structure for single sensor



**Attention!** The feasibility of a code number does not mean the effective availability of a product. Please contact our sales office.

### Single actuator code structure





### Main features

- Actuation without contact, mechanical
- Stainless steel fixing plates
- Output contacts: 2NC, 1NO+2NC or 1NO+1NC
- Insensitive to dirt
- Protection degrees IP67 and IP69K
- Coded actuator
- Technopolymer housing
- Versions with M8 or M12 connector

### Markings and quality marks:



UL approval: E131787  
 TÜV SÜD approval: Z10 15 08 75157 008  
 EAC approval: RU C-IT ДМ94.В.01024

### In conformity with the requirements of:

Low Voltage Directive 2006/95/EC  
 Machinery Directive 2006/42/EC  
 EMC Directive 2004/108/EC.

### Technical data

#### Housing

Housing made of glass fiber reinforced technopolymer, self-extinguishing.  
 Versions with integrated cable 4 x 0.25 mm<sup>2</sup> or 6 x 0.25 mm<sup>2</sup>, length 2 m, other lengths on request.  
 Versions with M8 connector  
 Versions with cable, length 0.1 m, M12 connector  
 Protection degree:

IP67 acc. to EN 60529  
 IP69K acc. to ISO 20653  
 (Protect the cables from direct high-pressure and high-temperature jets)

#### General data

For safety applications up to: SIL 3 acc. to EN 62061  
 PL e acc. to EN ISO 13849-1  
 type 4 acc. to EN ISO 14119  
 Low acc. to EN ISO 14119

Interlock without contact, coded:  
 Coding level:  
 Safety parameters:  
 B<sub>10d</sub>: 20,000,000 (with compatible Pizzato Elettrica safety modules)  
 400,000 (at max. load: DC12 24 V 250 mA)

Service life: 20 years  
 Ambient temperature: -25°C ... +80°C  
 Vibration resistance: 10 gn (10...150 Hz) acc. to IEC 60068-2-6  
 Shock resistance: 30 gn; 11 ms acc. to EN 60068 2 27  
 Pollution degree: 3  
 Screw tightening torque: 0.8 ... 2 Nm

#### In conformity with standards:

IEC 60947-1, EN 60947-1, IEC 60947-5-1, EN 60947-5-1, EN 60947-5-2, EN 60947-5-3 (in connection with safety module), EN ISO 14119, EN ISO 12100, EN ISO 13849-1, EN ISO 13849-2, IEC 60204-1, EN 60204-1, IEC 60529, EN 60529, ISO 20653, UL 508, CSA 22.2 No.14 .

#### Approvals:

UL 508, CSA 22.2 No.14 , EN ISO 13849-1, EN 60947-5-3, EN 50178, EN 61508-1, EN 61508-2, EN 61508-4, IEC 62061, EN 60947-1.

#### Actuation data

Assured operating distance Sao: 5 mm with actuator SM B01F  
 Assured release distance Sar: 15 mm with actuator SM B01F  
 Assured operating distance Sao: 8 mm with actuator SM B02F  
 Assured release distance Sar: 20 mm with actuator SM B02F  
 Repeat accuracy: ≤ 10%  
 Switching frequency: up to 150 Hz  
 Distance between two sensors: Min. 50 mm

#### Electrical data

Rated insulation voltage Ui: 120 Vac (with cable)  
 60 Vac / 75 Vdc (with M8 connector)  
 120 Vac (with 4-pin M12 connector)  
 30 Vac / 36 Vdc (with 8-pin M12 connector)

Rated impulse withstand voltage (U<sub>imp</sub>): 6 kV  
 1.5 kV (with connector)

Thermal current I<sub>th</sub>: 0.25 A  
 Max. switching load: 6 W (resistive load)  
 Rated operating voltage U<sub>e</sub>: 24 Vac/dc  
 Rated operating current I<sub>e</sub>: 0.25 A (resistive load)  
 Protection fuse: 0.25 A type F  
 Electrical endurance: 1 million operating cycles

### Connection with safety modules for safety applications:

Connection with safety modules CS AR-01●●●●; CS AR-02●●●●; CS AR-04●●●●; CS AR-05●●●●; CS AR-06●●●●; CS AR-08●●●●; CS AR-46●024; CS AR-91●●●●; CS AT-0●●●●●; CS AT-1●●●●●; CS AT-3●●●●●; CS FS-5●●●●●; CS MF●●●●●●●; CS MP●●●●●●●.  
 When connected to the safety module the sensor can be classified as a control circuit device to PDF-M (EN 60947-5-3).  
 The system can be used in safety circuits to PL e/SIL 3/category 4 in accordance with EN ISO 13849-1.

### Characteristics approved by UL

Utilization categories: 24 Vdc, 0.25 A (resistive load).

Data of housing type 1, 4X "indoor use only"; 12.

Accessory for CS series.

In conformity with standard: UL 508, CSA 22.2 No.14

Please contact our technical service for the list of approved products.

### Characteristics approved by TÜV SÜD

Supply voltage: 24 Vac/dc  
 Rated operating current (max.): 0.25 A  
 Ambient temperature: -25°C ... +80°C  
 Protection degree: IP67  
 PL, category: PL e, category 4 with CS AR-08

In conformity with standards: 2006/42/EEC Machine Directive, EN ISO 13849-1:2008, EN 60947-5-3/A1:2005, EN 50178:1997, EN 61508-1:1998 (SIL 1-3), EN 61508-2:2000 (SIL 1-3), EN 61508-4:1998 (SIL 1-3), IEC 62061:2005 (SIL CL 3), EN 60947-1

Please contact our technical service for the list of approved products.

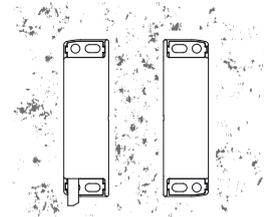


### Description



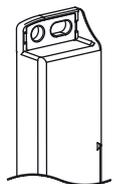
Coded magnetic sensors are devices suitable for monitoring protections and guards of machines without inertia which, when linked to a safety module, can create a system with safety category up to SIL 3 according to EN 62061, up to PL e according to EN ISO 13849-1 and up to category 4 according to EN ISO 13849-1. These products are composed by a magnetic field monitoring sensor, which is connected to the machine structure; and by a coded magnetic actuator, which has to be connected to the movable guard. When sensor and actuator are neared (closed guard), the sensor recognizes the actuator and provides to actuate electric contacts. The sensor is manufactured to be activated only by the correct coded actuator and not through a common magnet.

### Insensitivity to dirt



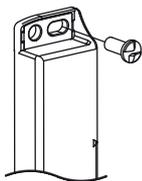
Magnetic sensors are totally sealed and retain their safety characteristics also where dirt and dust are present (not ferromagnetic material). This characteristic, joined with the shape without recesses, make them especially proper to the use in the agro-industrial sector.

### Stainless steel fixing plates



In order to avoid that the fixing on non-perfectly plane surfaces could damage the fixing slots, magnetic sensors are provided with stainless steel fixing plates. Also in presence of right fixing surfaces, this solution makes the sensor stronger to mechanical stresses.

### Safety screws for actuators



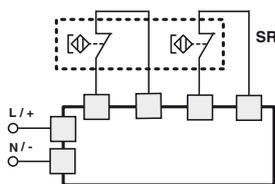
As required by EN ISO 14119, the actuator must be fixed immovably to the door frame. Pan head safety screws with one-way fitting are available for this purpose. With this screw type, the actuators cannot be removed or tampered with using common tools. See accessories on page 295.

### Laser engraving



All devices are indelibly marked with a dedicated laser system that allows the marking to be also suitable for extreme environments. This system that does not use labels, prevents the loss of plate data and the marking is more resistant over time.

### Compatible safety modules

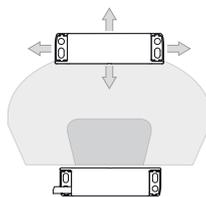


These magnetic sensors have been checked and tested for operation with suitable safety modules (see list). Using completed and tested solutions, the customer has the certainty to have no electric incompatibility between sensor and safety module, and has a higher reliability guarantee.

Sensors	Compatible safety modules	Safety module output contacts	
		Instantaneous contacts	Delayed contacts
SR BD40A●● SR BD41A●● SR BD42A●● <sup>a</sup>	CS AR-01●●●● <sup>b</sup>	2NO+1NC	/
	CS AR-02●●●● <sup>b</sup>	3NO	/
	CS AR-04●●●● <sup>b</sup>	3NO+1NC	/
	CS AR-05●●●●	3NO+1NC	/
	CS AR-06●●●●	3NO+1NC	/
	CS AR-08●●●●	2NO	/
	CS AR-46●024	1NO	/
	CS AR-91●●●●	2NO+1PNP	/
	CS AT-0●●●●	2NO+1NO	2NO
	CS AT-1●●●●	3NO	2NO
	CS AT-3●●●●	2NO	1NO
	CS FS-5●●●●	1NO+1NC+1CO	/
	CS MP●●●●●●	see page 243	see page 243
	CS MF●●●●●●	see page 271	see page 271

<sup>a</sup> Compatible with CS MF202●●-P4 (page 276) and CS MP●●●●●● only.  
<sup>b</sup> Compatible with modules with production batch later than 04/2014 only.  
For features of the safety modules see page 181.

### Wide actuation zone

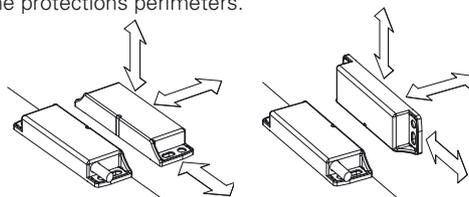


Because of their intrinsic characteristics, magnetic sensors have a wide actuation zone, which make them appreciated in the use of inaccurate protections or for protection that can change their mechanic characteristics through the time.

In this type of sensors actuation distances may change according to the actuator displacement direction from the sensor.

### Actuation from many directions

The magnetic sensors have been designed in order to be activated by the related actuator from many directions. In this way, the customer has the max. flexibility about the placing of the devices along the protections perimeters.



### Protection degrees IP67 and IP69K

# IP69K IP67

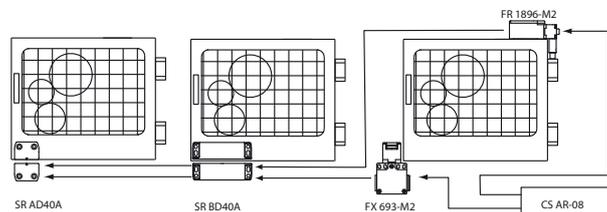
These devices are designed to be used in the toughest environmental conditions and they pass the IP67 immersion test acc. to IEC 60529. They can therefore be used in all environments where the maximum protection of the housing is required. Special measures also allow devices to be used even in machines which are subjected to washing with high pressure warm water jets. In fact these devices pass the IP69K test according to ISO 20653, using jets of water to 100 atmospheres at a temperature of 80°C.

### Connection of sensors and switches in series

The magnetic sensors can be connected in series with the only limitation that the overall resistance, of sensors and the related wiring, has to be not higher than the admitted max. value of the module, which typically is equal to 50 ohm (see module features). It is a very high value that, with normal wiring, allows the use of dozens of sensors without problems. It is also possible to realize mixed circuit solutions connecting in series magnetic sensor to safety switches, with the only limitation of the above mentioned max. electric resistance.

We remind you that connection in series of two or more coded sensors reduce the system self-monitoring capacity which passes to category 3 in conformity with EN ISO 13849-1.

It is advisable to use safety modules by Pizzato Elettrica.

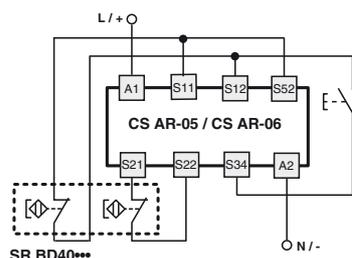


## Connection with safety modules

Connection with safety modules CS AR-05 or CS AR-06

Input configuration with manual start (CS AR-05) and monitored start (CS AR-06)

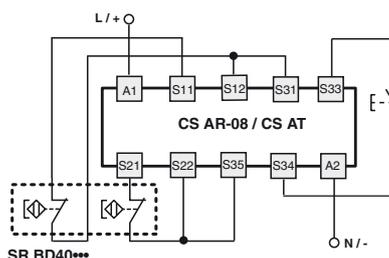
2 channels



Connection with safety module CS AR-08 or CS AT

Input configuration with manual start

2 channels



For features of the safety modules see page 181.

## Internal connections with cable

Contacts imply closed protection

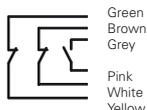
With cable (2NC)



With cable (1NC+1NO)



With cable (2NC+1NO)



## Internal connections with connector

Contacts imply closed protection

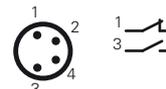
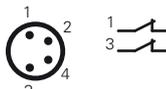
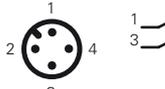
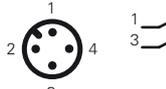
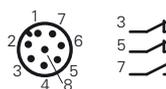
With M12 connector (2NC+1NO)

With M12 connector (2NC)

With M12 connector (1NC+1NO)

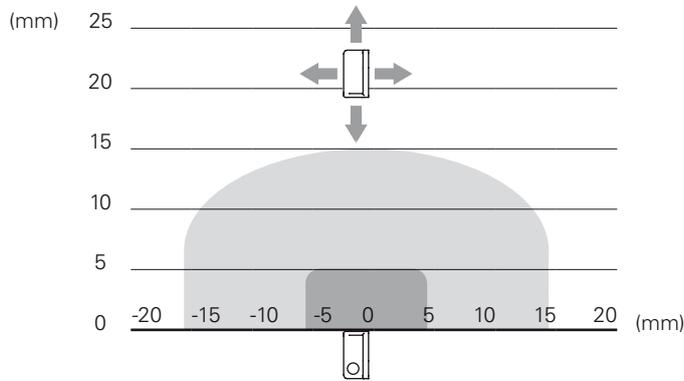
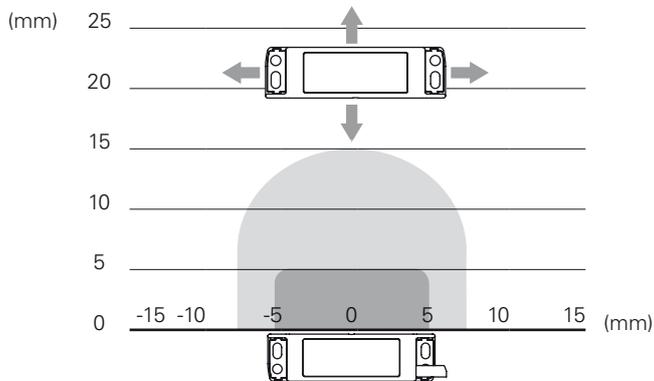
With M8 connector (2NC)

With M8 connector (1NC+1NO)

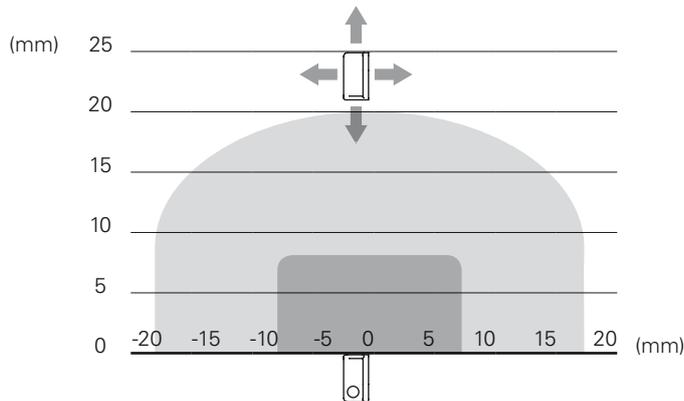
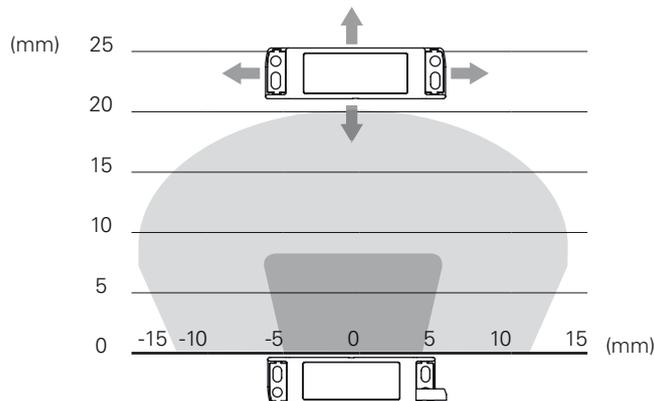


Sockets See page 287

## Operating distance SR BD-----B01F



## Operating distance SR BD-----B02F



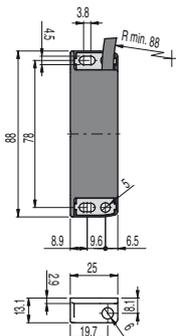
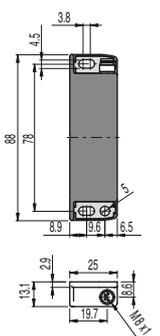
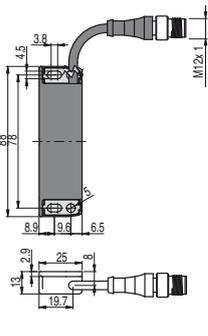
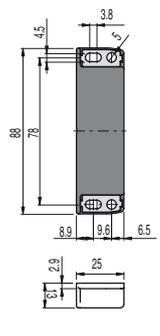
Legend:  
 ■ Assured operating distance Sao  
 ■ Assured release distance Sar

Note: The drawing of the activation areas is indicative.



### Dimensional drawings

All measures in the drawings are in mm

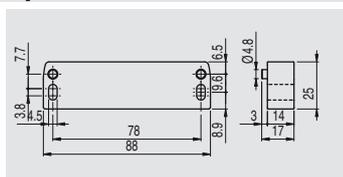
integrated cable, length 2 m	M8 connector	cable length 0.1 m and M12 connector	coded actuator Low level of coding acc. to EN ISO 14119
			
<b>SR BD40AN2</b> 2NC	<b>SR BD40ALK</b> 2NC	<b>SR BD40AM0.1</b> 2NC	<b>SM B01F</b> Actuation distance 5 mm
<b>SR BD41AN2</b> 1NO+2NC	<b>SR BD41ALK</b> 1NO+1NC	<b>SR BD41AM0.1</b> 1NO+2NC	<b>SM B02F</b> Actuation distance 8 mm
<b>SR BD42AN2</b> 1NO+1NC	<b>SR BD42ALK</b> 1NO+1NC	<b>SR BD42AM0.1</b> 1NO+1NC	

Items with code on **green** background are stock items

**Accessories** See page 287

→ The 2D and 3D files are available at [www.pizzato.com](http://www.pizzato.com)

### Spacer



This spacer is placed between the magnetic safety sensors and metal surfaces that can deviate the magnetic field created by the sensor: with this specific spacer between them the sensor activation and deactivation distances remain the same.

Article	Description
VS SP1BA1	Spacers for SR B series sensors

### Coded magnetic sensors used for safety applications

A coded magnetic sensor alone can not be used for safety functions because its working principles are not considered safe by the standards (as are, for example, the positive opening on mechanical switches). For this reason a coded magnetic sensor, in order to be used in safety applications, has to be compulsory connected to a proper safety module which controls correct operation, through a circuit with at least two channels.

### Utilization limits

- The installation must be performed by qualified staff only.
- Before installation and at regular interval, check the right contacts switching and the system operation of the sensor and the associated safety module.
- Do not use a hammer for adjustment.
- Do not use the sensor as a mechanical stop.
- Observe the assured operating and release distances.
- Adhere to the EN ISO 14119 requirements regarding low level of coding for interlocks.
- Do not install the sensor and the actuator on strong magnetic field.
- Keep away from iron filing.

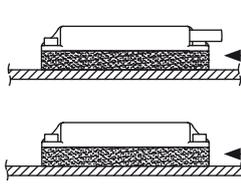
#### Shock, vibrations and wear:

- Do avoid impact with the sensor. Excessive shock and vibrations may affect correct operation of the sensor.
- The actuator must not strike sensor.
- In case of damages or wear is necessary to change the whole device, included the actuator.

#### Attention during wiring:

- Keep load under the value indicated in the electrical data.
- When the sensor contacts are used without the respective safety module, connect in series to each contact the protection fuse indicated in the electrical data.
- Turn off the power supply before access to the switch connection contacts, also during the wiring.

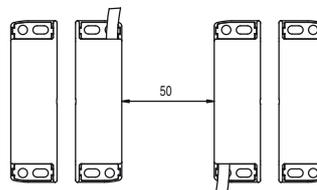
#### Installation on ferromagnetic material



- If possible do not mount the sensor and the actuator on ferromagnetic materials.
- In order to avoid switching distances reductions, use VS SP1AA1 spacers.

Spacer

#### Multiple systems sensor-actuator assembly



The minimum mounting gap between sensor-actuator systems must be at least 50 mm.