



PSEN® sensor technology for man and machine

Safety switches PSENmech, PSENmag, PSENcode and PSEnbolt
Secure safety gate systems PSENSlock
Optoelectronic protective devices PSENopt and PSENopt SB
Safe camera systems SafetyEYE and PSEnvip

pilz

The safe, complete solution.





the spirit of safety

► Business activities

Excellent Components

Sensor technology	<ul style="list-style-type: none"> ▶ Safety switches ▶ Secure safety gate systems ▶ Optoelectronic protective devices ▶ Safe camera systems 	
Control and communication	<ul style="list-style-type: none"> ▶ Electronic monitoring relays ▶ Safety relays ▶ Programmable safety and control systems ▶ Industrial communication 	
Motion Control	<ul style="list-style-type: none"> ▶ Control systems ▶ Servo amplifiers ▶ Motors 	
Operating and monitoring	<ul style="list-style-type: none"> ▶ Control and signal devices ▶ Operator terminals 	
Software	<ul style="list-style-type: none"> ▶ System software ▶ User software ▶ Software tools 	

Professional Services

Consulting and engineering	<ul style="list-style-type: none"> ▶ Risk analysis ▶ Safety concept ▶ Safety design ▶ System integration ▶ Validation ▶ CE services ▶ International conformity assessment ▶ Plant assessment ▶ Inspection of ESPE 	  
Training	<ul style="list-style-type: none"> ▶ Seminars ▶ Courses 	



Support

Technical help round the clock!

Technical support is available from Pilz round the clock. This service is provided free of charge beyond standard business hours.

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► Why does Pilz offer more?

Because the integrity of our business activities is what sets us apart.



Pilz is a solution supplier for all automation functions. Including standard control functions. Developments from Pilz protect man, machine and the environment. That's why all our experience and knowledge goes into individual products as well as consistently sophisticated system solutions.

- ▶ Sensor technology
- ▶ Control and communication
- ▶ Motion Control
- ▶ Operating and monitoring
- ▶ Software
- ▶ Consulting and engineering
- ▶ Training

Appropriate services relating to individual components and independent generic services guarantee that our customers obtain customised automation solutions, all from one source.

Pilz is a family business that's closer to its customers.

Pilz has a tradition as a family-run company stretching back 60 years.

Real proximity to customers is visible in all areas, instilling confidence through individual consultation, flexibility and reliable service.

We are your contact, guide and competency leader en route to an optimum automation solution.



PSEN[®] sensor technology for man and machine

In automation technology, the information required for process management is obtained via sensors. Safety sensors provide effective personal security and industrial safety in automated production and logistics processes.

Stricter safety regulations now require health and safety measures to be safe from manipulation and defeat. This makes modern safety sensors absolutely indispensable. Used in conjunction with Pilz safe control technology, PSEN sensor technology protects man and machine in compliance with the standards.

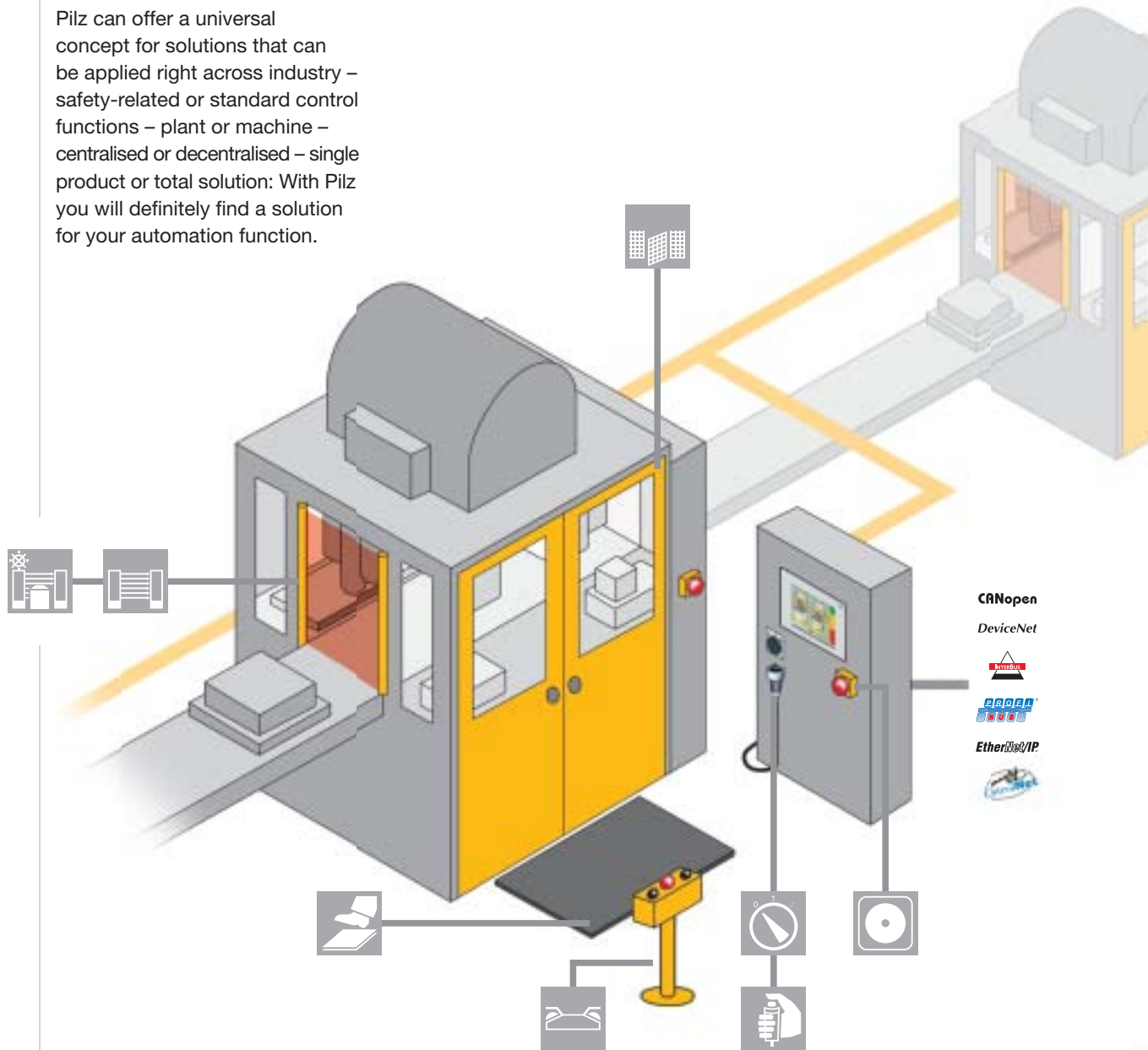
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► Solution supplier for safety and standard

Pilz can offer a universal concept for solutions that can be applied right across industry – safety-related or standard control functions – plant or machine – centralised or decentralised – single product or total solution: With Pilz you will definitely find a solution for your automation function.



Sensor technology



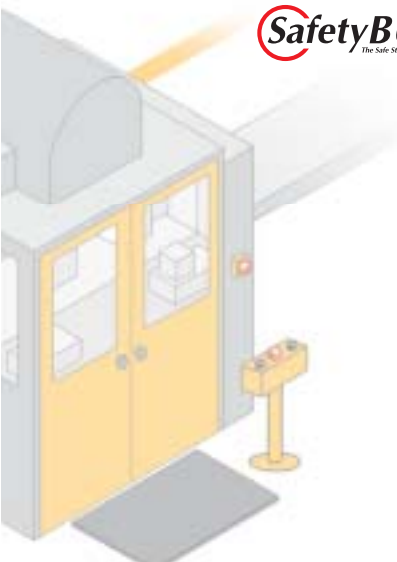
Operating and monitoring



Electronic monitoring relays
PMDsrange



Motion control

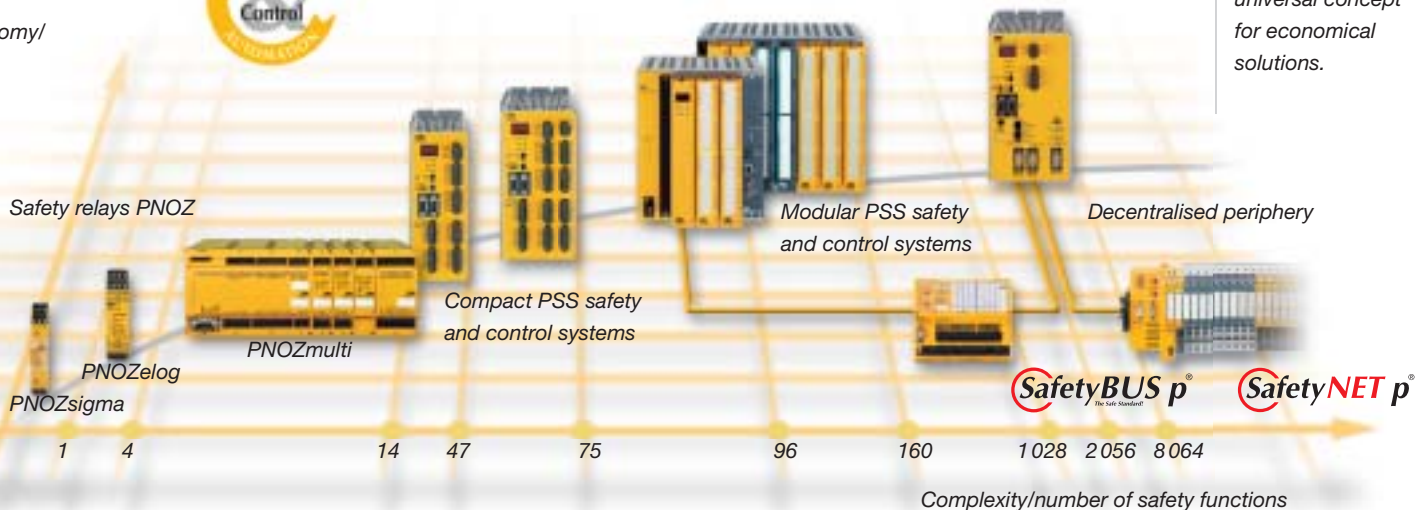


SafetyBUS p[®] The Safe Standard

- ▶ For electrical safety such as voltage or true power monitoring, electronic PMDsrange monitoring relays provide the optimum solution.
 - ▶ Pilz Motion Control (PMC) represents a flexible, modular and expandable automation system for complex motion and control functions. This automation system manages all the movements of a large number of physically separate servo axes within a plant.
 - ▶ For monitoring E-STOPS, safety gates, light curtains/light barriers, two-hand control and many other functions, we recommend Pilz safe control technology in terms of functional safety. Standard control functions are included.
- For simple plant and machinery with up to 4 safety functions, use the safety relays PNOZ X, PNOZsigma and PNOZelog.
 - To cover 4 to 14 safety functions, the modular safety system PNOZmulti is the most economical solution.
 - On complex machinery or distributed plants, PSS programmable safety and control systems can be used with decentralised networking via SafetyBUS p and SafetyNET p.

Enjoy the benefits of approved, co-ordinated, complete solutions. Our portfolio is being extended to include control and signal devices such as E-STOP pushbuttons, compatible sensor technology such as safety switches, light curtains/light grids and safe camera systems as well as operator terminals for diagnostics and visualisation. A wide range of services round off our business activities.

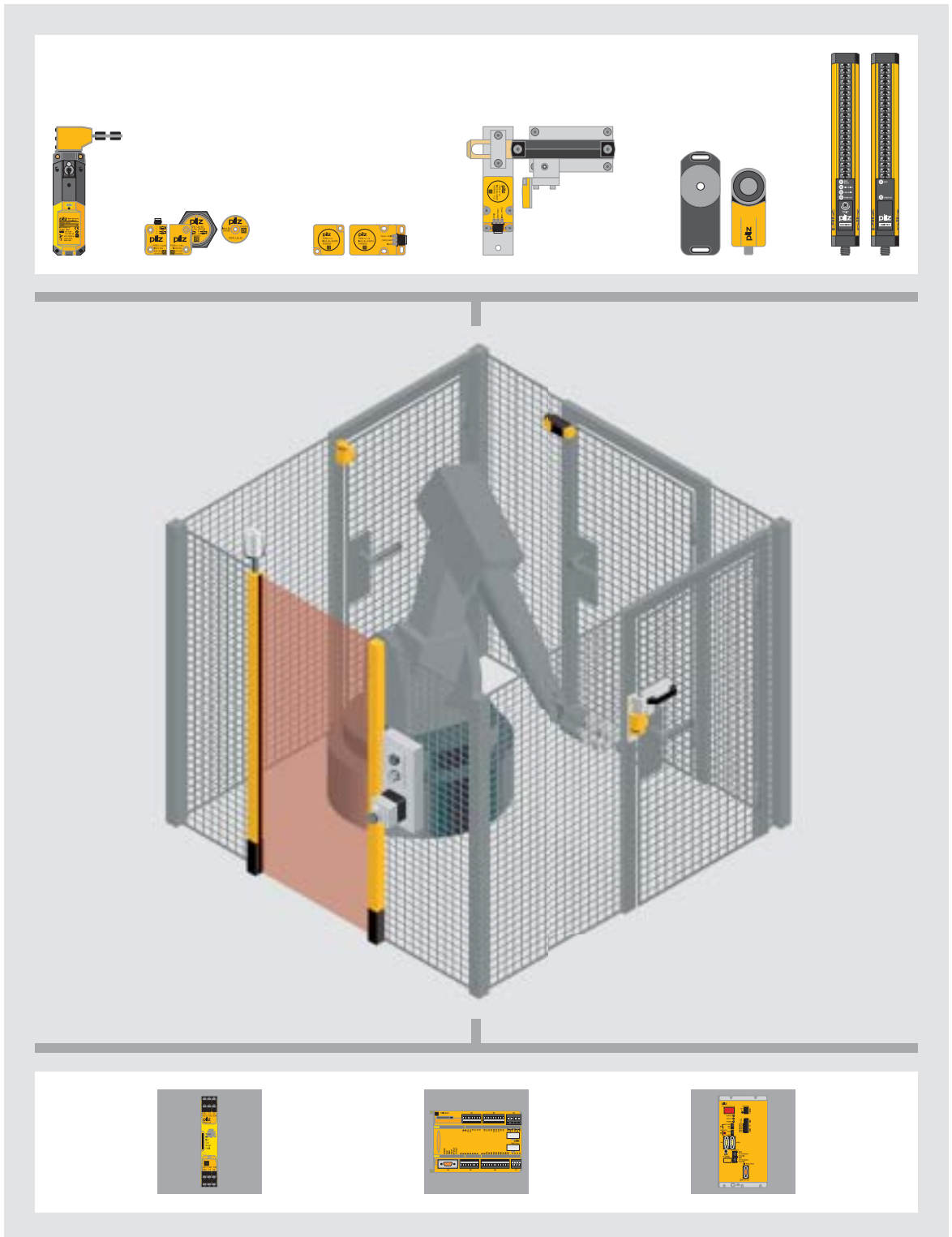
Economy/
costs



Pilz offers a universal concept for economical solutions.



► Sensor technology plus evaluation – The sa



The safe, complete solution from one source: Sensor and control technology from Pilz.

fe, complete solution

The right solution for every requirement

Where the protection of man and machine in the industrial environment is concerned, the highest possible plant availability must be achieved while remaining cost-effective. That's what Pilz can offer with a safe, complete, one-stop solution. Our components for both sensor and control technology are totally compatible and have been approved as a safe, overall system.

Select the safety-related components that meet your requirements and enjoy the benefits of a safe, complete solution!

Safety switches for safety gate and position monitoring

Hazardous machine movements must be stopped when a guard is opened. It must not be possible to either defeat or manipulate these guards. PSEN safety switches meet this requirement and are therefore suitable for monitoring gates in safety fences for safety zones, for example. Read more from page 8.

Secure safety gate systems for safety gate guarding

Strict safety regulations require health and safety measures to be safe from manipulation and defeat. Non-contact safety gate systems PSENSlock combine secure safety gate monitoring and a non-contact magnetic interlock within one unit, thereby offering a safe alternative to mechanical technology. Read more from page 26.

Light beam devices, light curtains, light grids to safeguard man and machine without the use of barriers

Optoelectronic protective devices such as PSENOpt light beam devices, light curtains and light grids are used to safeguard danger points and danger zones, where the production process requires active intervention. PSENOpt provides finger, hand and body protection in accordance with EN/IEC 61496-1/-2. Read more from page 30.

Safe camera systems – innovative optical system for safety

The safe camera systems SafetyEYE and PSENVip provide a high level of safety plus user-friendly functionalities for many safety and standard control functions. Read more from page 58.

Acquire that specialist knowledge first-hand

Pilz offers a complete package of services, concepts and solutions relating to the issue of sensor technology, a package that is tailored to meet your requirements. Take some advice: We can provide training for machinery safety and services, such as inspection of ESPE (electrosensitive protective equipment).

Certified worldwide

PSEN sensor technology complies with international standards and regulations. Our safety sensors are certified by TÜV, UL and other international approvals bodies. They provide maximum safety for applications up to Performance Level e of EN ISO 13849-1 and SIL 3 of IEC 62061, or up to Category 4 of EN 954-1.

Keep up-to-date on sensor technology:

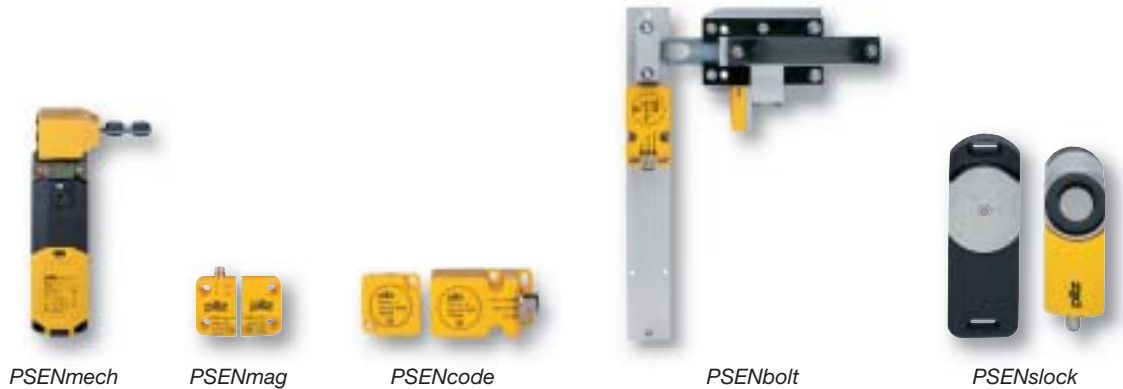
Webcode 0219

Online information at www.pilz.com





► Safety switches PSENmech, PSENmag, PSEN



For safety gate and position monitoring

According to the standard EN 1088, hazardous machine movements must be stopped when a guard is opened and a restart must be prevented. It must not be possible to either defeat (VDE 060) or manipulate (EN 1088) these guards.

PSEN safety switches are particularly effective and economical in meeting these requirements. They are available with various designs and operating principles, can be used under difficult environmental conditions and can be connected in series. Choose the appropriate mechanical, magnetic or coded safety switch from Pilz!

For each application ...

Mechanical safety switches are particularly suitable for applications in which the safety gate should not be opened unintentionally. More from page 12.

Selection guide for PSEN safety switches and safety gate systems

Type	PSENmech	PSENmag	PSENcode	PSENbolt ¹⁾	PSENslock
Method	Mechanical	Non-contact, magnetic	Non-contact, coded	Mechanical	Non-contact, coded
Manipulation protection	Possible	Possible	Integrated	- ²⁾	Integrated
Guard locking	With/without	-	-	-	Integrated
IP protection type	Up to IP65/IP67	IP67/IP69k	IP67	-	IP67
Harsh environmental conditions	Sensitive	Insensitive	Insensitive	Insensitive	Insensitive
Tolerance when guiding gates	Up to 0.5 mm	3 ... 8 mm	Up to 15 mm	- ²⁾	Up to 5 mm

¹⁾ PSENbolt used with PSEN me1 and PSENcode

²⁾ Depending on the safety switch that is used

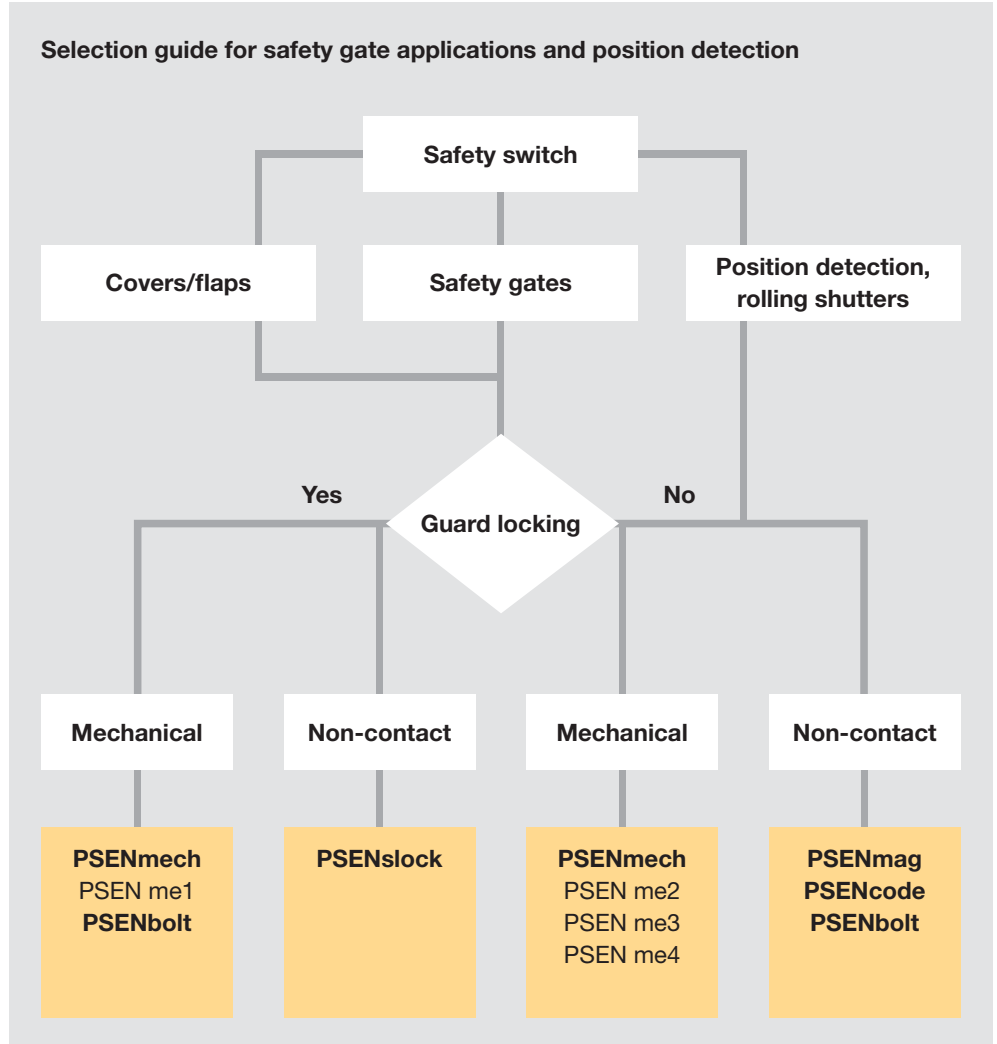
code and PSENbolt

... the appropriate switch

PSENm_{ag} non-contact, magnetic safety switches can be used when the risk analysis specifies a high category, where there is heavy soiling or where strict hygiene regulations need to be met. More from page 16.

The highest level of protection against manipulation can be achieved using the non-contact, coded safety switches PSENcode; the enable is triggered when the actuating element is within the switch's response range and the code on the actuator matches that of the switch (key lock principle). More from page 22.

PSENb_{olt} safety bolts are used in conjunction with safety switches and offer the best protection for safety gates that are difficult to adjust or in areas where safety gates are opened and closed frequently. More from page 24.



Keep up-to-date on safety switches PSEN:

Webcode 0307

Online information at www.pilz.com



Applications and industries
 Safety switches PSENmech, PSENmag,
 PSENcode and PSEnbolt

► Safety switches for every environment and

Why not fit Pilz safety switches!
 They are suitable for applications
 in classic mechanical engineering
 as well as sectors with rigorous
 hygiene requirements, such as
 the food, packaging or pharma-
 ceutical industry.

Enduring in use, proven many times over

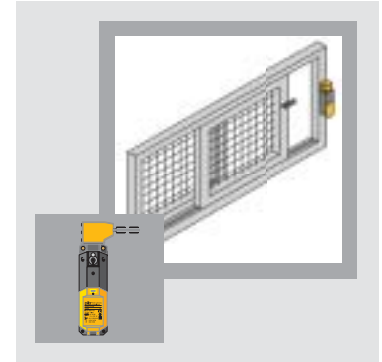
The PSEN housing is made from
 silicone-free PBT plastic, which is
 insensitive to dirt. It has a smooth
 surface with laser inscription and
 the housing material is resistant
 to many chemicals; also, PSEN
 safety switches are dust-tight
 and waterproof to comply with
 protection type IP69k.

Guard locking until the risk is averted

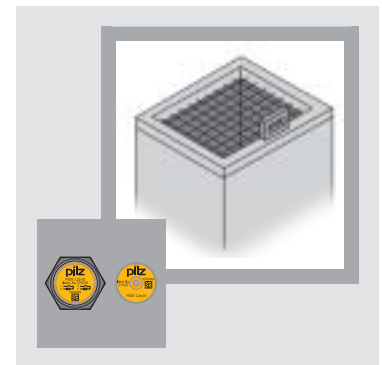
PSENmech mechanical safety
 switches with guard locking
 ensure that guards remain in
 the closed position until the
 hazardous movement, e.g. a
 main spindle overrun, has been
 brought to a standstill. In this way
 you can prevent the safety device
 from being opened inadvertently
 while a process is running.

Transponder technology for metal processing plant and machinery

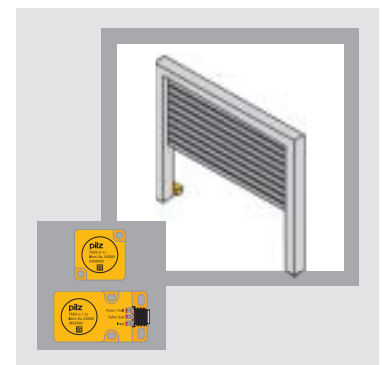
Thanks to the use of non-mag-
 netic technology, PSENcode
 non-contact, coded safety
 switches are ideal for metal
 processing plant and machinery.



Monitoring a sliding gate
 with PSENmech.



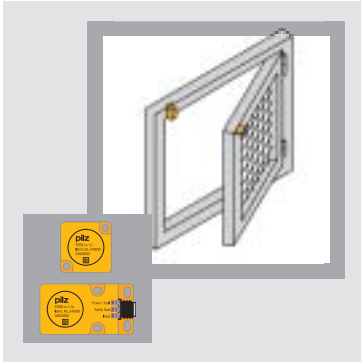
Monitoring a flap with PSENmag.



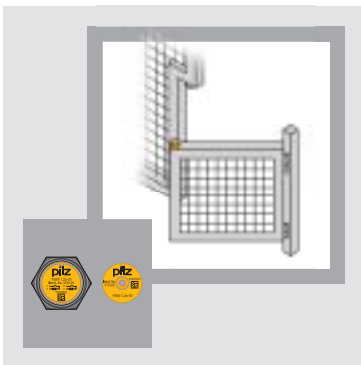
Detecting the position and monitoring
 a rolling shutter with PSENcode.



application



Using the PSENcode to monitor a swing gate with large tolerances.



Monitoring a swing gate with PSENmag in an EX area.

High level of safety – even in potentially explosive areas

PSENmag and PSENcode safety switches can also be used for applications in which potentially explosive atmospheres may arise due to gases or dust.

Still functional – even when concealed

The installation of the safety switches PSENmag and PSENcode can be concealed. The PSENmag remains functional even when covered by non-magnetic materials.



Application overview for PSEN safety switches

Application	Product			
	PSENmech	PSENmag	PSENcode	PSENslock
Cover	◆	◆	◆	-
Flap	◆	◆	◆	◆
Safety gate	◆	◆	◆	◆
Rolling shutters	-	◆	◆	-
Position detection	-	◆	◆	-



▶ Mechanical safety switch PSENmech



PSEN me1



PSEN me2



PSEN me3



PSEN me4

... and the gate stays closed

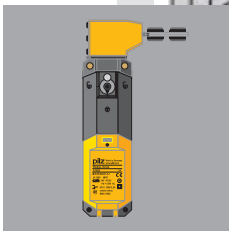
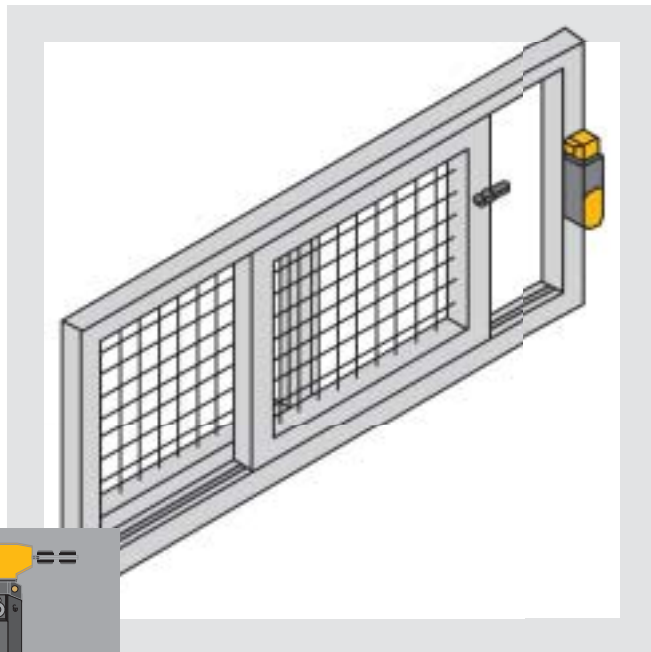
PSENmech mechanical safety switches are suitable for safe monitoring of a movable guard. They are triggered if the guards are opened, and the hazardous machine movement is stopped via a Pilz evaluation device.

Using increased extraction force on the actuator, PSENmech safety switches prevent the safety gate from being opened unintentionally. They comply with the standard EN 1088 (protection against defeat) due to their coded actuators.

PSENmech safety switches with guard locking ensure that the safety gate is interlocked (guard locking) until the hazardous production process is complete. They can also prevent production from being interrupted as a result of unauthorised access.

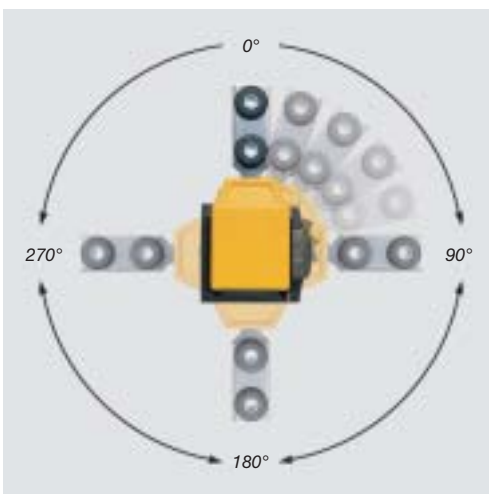
The appropriate PSENmech safety switch for each application

Type	PSEN me1	PSEN me2, PSEN me3, PSEN me4
Interlock	Spring force, magnetic force	-
Holding force	1,500 N	-
Auxiliary release	Yes	-
Actuator type	Standard, radius	Standard, radius
Extraction force	27 N	10, 30, 50, 100 N
Contacts	2 N/C, 2 N/O	1 or 2 N/C; 1 N/O
Supply voltage	24 VAC/DC, 24 VDC/24, 110, 230 VAC	-
Contact load - Utilisation category (AC-15)	230 V/2.5 A	240 V/1.5 A, 240 V/3.0 A
- Conv. therm. current	2.5 A	5, 10 A



Your benefits at a glance

- ▶ In conjunction with Pilz evaluation devices, a safe, complete solution for applications up to Performance Level e of EN ISO 13849-1 and SIL 3 of IEC 62061, or up to Category 4 of EN 954-1
- ▶ Flexibility and speed during installation plus high availability for your plant due to:
 - Compact design
 - Radius or standard actuator
 - Up to four horizontal and four vertical approach directions
 - Innovative connection technology
- ▶ Long product service life due to the robust design and high mechanical load capacity
- ▶ Suitable for a variety of applications due to the wide operating temperature range
- ▶ Housing is insensitive to dirt, dust-tight and waterproof to IP67



Universal actuation directions provide flexibility during installation.



Keep up-to-date
on safety switches
PSENmech:

 Webcode 0314

Online information
at www.pilz.com



▶ Selection guide – Mechanical safety switch

Common features

- ▶ Safety switches for monitoring the position of movable guards in accordance with EN 60947-5-3
- ▶ Can be connected to all Pilz evaluation devices
- ▶ Directions of actuation:
 - PSEN me1: eight
 - PSEN me2, me3: four
 - PSEN me4: eight
- ▶ Contact load PSEN me1:
 - Utilisation category: AC-15: 230 V/2.5 A
 - Conv. thermal current: 2.5 A
- ▶ Dimensions (H x W x D, excl. actuator):
 - PSEN me1: 170 x 42.5 x 51 mm
 - PSEN me2: 75 x 52 x 33 mm
 - PSEN me3: 90 x 52 x 33 mm
 - PSEN me4: 100 x 31 x 30.5 mm
- ▶ Ambient temperature:
 - PSEN me1: -25 ... +70 °C/-13 ... +158 F
 - PSEN me2, me3, me4: -30 ... +80 °C/-22 ... +176 F
- ▶ Connection terminals:
 - PSEN me1: cage clamp terminals
 - PSEN me2, me3, me4: screw terminals
- ▶ Protection type:
 - PSEN me1: IP67
 - PSEN me2, me3, me4: IP65
- ▶ Plastic-bodied design

PSENmech mechanical safety switch with separate actuator and guard



PSEN me1S/1AS

Type	Interlock principle
PSEN me1S/1AS	Spring force
PSEN me1.1S/1AS	Spring force
PSEN me1S/1AR	Spring force
PSEN me1.1S/1AR	Spring force
PSEN me1M/1AS	Magnetic force
PSEN me1M/1AR	Magnetic force

PSENmech mechanical safety switch with separate actuator, PSEN me2,



PSEN me2S/2AS



PSEN me3S/2AR



PSEN me4/2AS

Type	Actuator type
PSEN me2S/2AS	Standard
PSEN me2.1/2AS	Standard
PSEN me2/2AR	Radius
PSEN me3/2AS	Standard
PSEN me3.01/2AS	Standard
PSEN me3.02/2AS	Standard
PSEN me3.02/2AR	Radius
PSEN me3/2AR	Radius
PSEN me3.1/2AS	Standard
PSEN me3.11/2AS	Standard
PSEN me3.1/2AR	Radius
PSEN me3.2/2AS	Standard
PSEN me3.21/2AS	Standard
PSEN me3.2/2AR	Radius
PSEN me4/4AS	Standard
PSEN me4.01/4AS	Standard
PSEN me4.1/4AS	Standard
PSEN me4.11/4AS	Standard
PSEN me4.2/4AS	Standard
PSEN me4.21/4AS	Standard

PSENmech

locking, PSEN me1 series

Actuator type	Contacts	Supply voltage	Auxiliary release	Holding force	Extraction force	Order number ¹⁾
Standard		24 VAC/DC	◆	1,500 N	Min. 27 N	570 000
Standard		24 VDC, 24, 110, 230 VAC	◆	1,500 N	Min. 27 N	570 002
Radius		24 V AC/DC	◆	1,500 N	Min. 27 N	570 001
Radius		24 VDC, 24, 110, 230 VAC	◆	1,500 N	Min. 27 N	570 003
Standard		24 VAC/DC	-	1,500 N	Min. 27 N	570 004
Radius		24 VAC/DC	-	1,500 N	Min. 27 N	570 005



¹⁾ Order number for safety switch and actuator (one unit).

PSEN me3, PSEN me4 series

	Contacts	Contact load		Extraction force	Order number ¹⁾
		Utilisation category AC-15	Conventional thermal current		
		240 V/1.5 A	5 A	10 N	570200
		240 V/1.5 A	5 A	100 N	570202
		240 V/1.5 A	5 A	10 N	570201
		240 V/3.0 A	10 A	10 N	570210
		240 V/3.0 A	10 A	100 N	570211
		240 V/3.0 A	10 A	30 N	570213
		240 V/3.0 A	10 A	30 N	570214
		240 V/3.0 A	10 A	10 N	570212
		240 V/3.0 A	10 A	10 N	570220
		240 V/3.0 A	10 A	100 N	570221
		240 V/3.0 A	10 A	10 N	570222
		240 V/1.5 A	5 A	10 N	570230
		240 V/1.5 A	5 A	100 N	570231
		240 V/1.5 A	5 A	10 N	570232
		240 V/3.0 A	10 A	10 N	570240
		240 V/3.0 A	10 A	50 N	570241
		240 V/3.0 A	10 A	10 N	570245
		240 V/3.0 A	10 A	50 N	570246
		240 V/1.5 A	5 A	10 N	570251
		240 V/1.5 A	5 A	50 N	570250

Technical documentation on safety relays PSENmech:

Webcode 0314

Online information at www.pitz.com



▶ Non-contact, magnetic safety switch PSEN



PSEN 1.1p-20



PSEN 1.1a-20



PSEN 1.2p-20



PSEN ma1.3a-20

... maximum freedom for installation

Non-contact, magnetic safety switches are used to monitor the position of movable guards in accordance with EN 60947-5-3 and also for general position monitoring.

PSENmag switches can be used for applications in which

the risk analysis specifies a high category, where there is heavy soiling or where strict hygiene regulations need to be met.

For applications in which it is difficult to align the gates accurately, where machine gates are subject to a high level of vibration and where large tolerances are required on start up, PSENmag switches are the right choice.

As the process is running, they ensure that the machine operates provided the safety gate is closed. If the movable guard is opened, they work in conjunction with the Pilz evaluation device to ensure that your machine is shut down quickly. Together you have a complete solution that's safe and approved, all from the one source.

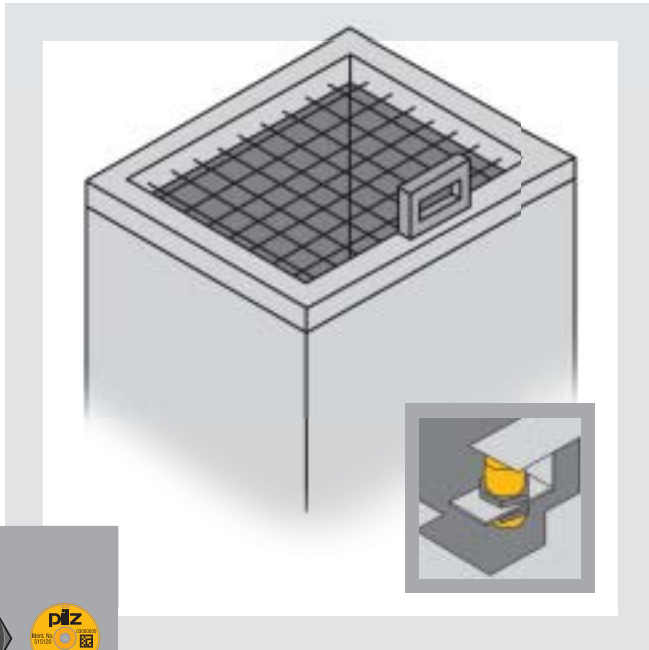
The appropriate PSENmag safety switch for each application

Type	PSENmag series PSEN 1	PSENmag series PSEN 2
Approved in conjunction with the following evaluation devices	<ul style="list-style-type: none"> ▶ PNOZ X safety relays ¹⁾ ▶ PNOZsigma safety relays ¹⁾ ▶ PNOZpower safety relays: PNOZ p1p ▶ PNOZmulti modular safety systems: all evaluation devices ▶ PSS programmable safety and control systems, with or without SafetyBUS p interface: all evaluation devices 	<ul style="list-style-type: none"> ▶ PNOZelog electronic safety relays ¹⁾ ▶ PNOZmulti modular safety systems: all evaluation devices ▶ PSS programmable safety and control systems, with or without SafetyBUS p interface: all evaluation devices
ATEX approval	Yes	Yes
LED	With/without	Without
Series connection ²⁾	Direct or via PSEN ix1	Direct or via PSEN i1

¹⁾ Please refer to the operating manual for further information.

²⁾ Read more from page 29.

mech



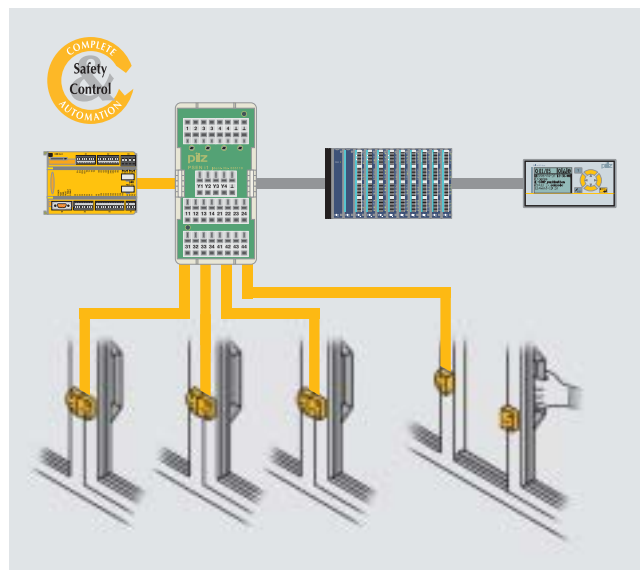
Your benefits at a glance

- ▶ Complete, co-ordinated solution that's economical and safe, with BG approval in accordance with EN 60947-5-3 for applications up to Performance Level e of EN ISO 13849-1 and SIL 3 of IEC 62061, or up to Category 4 of EN 954-1
- ▶ Possible to conceal installation to protect against defeat in accordance with VDE 0660
- ▶ Cost-effective thanks to the ability to connect in series and a long product service life as it is mechanically non-wearing
- ▶ Insensitive to shock and vibration

Safety in series up to Category 3 of EN 954-1

Up to 48 PSEnmag switches can be connected in series. Depending on the evaluation unit they can be cascaded using the safety interface PSEN ix1 or PSEN i1. Cage clamp terminals make this a particularly simple, fast and safe operation.

No additional wiring is required for diagnostics and the signal output because the safety interface can be connected directly to the evaluation device. This uses the status indicator to signal whether the safety gate is open or closed.



Series connection of several PSEnmag up to Category 3.

Keep up-to-date on safety switches PSEnmag:

Webcode 0357

Online information at www.pilz.com



► Selection guide – PSENmag non-contact, ma

PSENmag non-contact magnetic safety switches, series 1

Common features

- ▶ Safety switches for monitoring the position of movable guards in accordance with EN 60947-5-3
- ▶ Connected directly or via the PSEN ix1 interface (see accessories, page 29)
- ▶ Approved for safe applications up to Performance Level e of EN ISO 13849-1 and SIL 3 of IEC 62061, or up to Category 4 of EN 954-1 in conjunction with:
 - PNOZsigma safety relays: PNOZ s3, PNOZ s4, PNOZ s5
 - PNOZ X safety relays: Almost all evaluation devices (please refer to the operating manual for further information)
 - PNOZpower safety relays: PNOZ p1p
 - PNOZelog safety relays: PNOZ e1, PNOZ e1.1p, PNOZ e1vp, PNOZ e5.11p, PNOZ e6.1p, PNOZ e6vp
 - PNOZmulti modular safety system: all evaluation devices
 - PSS programmable safety and control system, with or without SafetyBUS p interface: all evaluation devices
- ▶ Contacts:
 - PSEN 1.1, PSEN 1.2: 2 N/O
 - PSEN ma1.3: 2 N/O, 1 auxiliary contact (N/O)



PSEN 1.1p-10



PSEN 1.1a-20



PSEN 1.2p-20



PSEN ma1.3

Type	Design	Switching distance
PSEN 1.1p-10	Square	3 mm
PSEN 1.1p-12	Square	3 mm
PSEN 1.1p-20	Square	8 mm
PSEN 1.1p-22	Square	8 mm
PSEN 1.1p-23	Square	8 mm
PSEN 1.1p-25	Square	8 mm
PSEN 1.1a-20	Square	8 mm
PSEN 1.1a-22	Square	8 mm
PSEN 1.1b-20	Square	8 mm
PSEN 1.1b-22	Square	8 mm
PSEN 1.1b-23	Square	8 mm
PSEN 1.1b-25	Square	8 mm
PSEN 1.2p-20	Round	8 mm
PSEN 1.2p-22	Round	8 mm
PSEN 1.2p-23	Round	8 mm
PSEN 1.2p-25	Round	8 mm
PSEN ma1.3a-20	Round	8 mm
PSEN ma1.3a-22	Round	8 mm
PSEN ma1.3b-20	Round	8 mm
PSEN ma1.3b-22	Round	8 mm
PSEN ma1.3b-23	Round	8 mm
PSEN ma1.3b-25	Round	8 mm

genetic safety switches, series 1

Protection type	For single connection	For series connection	LED	ATEX	Connection type	Order number ¹⁾
IP65/IP67	◆	-	-	-	Plug-in	504210
IP65/IP67	-	◆	-	-	Plug-in	504212
IP65/IP67	◆	-	-	-	Plug-in	504220
IP65/IP67	-	◆	-	-	Plug-in	504222
IP65/IP67	◆	-	-	◆	Plug-in	504223
IP65/IP67	-	◆	-	◆	Plug-in	504225
IP69k	◆	-	-	-	5 m cable	504226
IP69k	-	◆	-	-	5 m cable	504228
IP69k	◆	-	-	-	10 m cable	504227
IP69k	-	◆	-	-	10 m cable	504229
IP69k	◆	-	-	◆	10 m cable	504250
IP69k	-	◆	-	◆	10 m cable	504251
IP65/IP67	◆	-	-	-	Plug-in	505220
IP65/IP67	-	◆	-	-	Plug-in	505222
IP65/IP67	◆	-	-	◆	Plug-in	505223
IP65/IP67	-	◆	-	◆	Plug-in	505225
IP69k	◆	-	◆	-	5 m cable	506220
IP69k	-	◆	◆	-	5 m cable	506221
IP69k	◆	-	◆	-	10 m cable	506222
IP69k	-	◆	◆	-	10 m cable	506223
IP69k	◆	-	◆	◆	10 m cable	506224
IP69k	-	◆	◆	◆	10 m cable	506225

¹⁾ Order number for safety switch and actuator (one unit).



Technical documentation on safety switches PSENmag:

Webcode 0357

Online information at www.pilz.com



▶ Selection guide – PSENmag non-contact, ma

PSENmag non-contact magnetic safety switches, series 2

Common features

- ▶ Safety switches for monitoring the position of movable guards in accordance with EN 60947-5-3
- ▶ Connected directly or via the PSEN i1 interface (see accessories, page 29)
- ▶ Connection type: M8 connector, 4 pin
- ▶ Approved for safe applications up to Performance Level e of EN ISO 13849-1 and SIL 3 of IEC 62061, or up to Category 4 of EN 954-1 in conjunction with:
 - PNOZelog safety relays: PNOZ e3.1p, PNOZ e3vp 10 s, PNOZ e3vp 300 s, PNOZ e5.13p
 - PNOZmulti modular safety system: all evaluation devices
 - PSS programmable safety and control systems/SafetyBUS p: All, in conjunction with standard function block SB066 for safety gate monitoring
- ▶ Contacts:
 - PSEN 2.1, PSEN 2.2: 1 N/C, 1 N/O



PSEN 2.1p-10



PSEN 2.1a-20



PSEN 2.2p-20

Type	Design	Switching distance
PSEN 2.1p-10	Square	3 mm
PSEN 2.1p-11	Square	3 mm
PSEN 2.1p-20	Square	8 mm
PSEN 2.1p-21	Square	8 mm
PSEN 2.1p-24	Square	8 mm
PSEN 2.1a-20	Square	8 mm
PSEN 2.1b-20	Square	8 mm
PSEN 2.1b-26	Square	8 mm
PSEN 2.2p-20	Round	8 mm
PSEN 2.2p-21	Round	8 mm
PSEN 2.2p-24	Round	8 mm

genetic safety switches, series 2

Protection type	For single connection	For series connection	LED	ATEX	Connection type	Order number ¹⁾
IP65/IP67	◆	◆	-	-	Plug-in	502210
IP65/IP67	◆	◆	◆	-	Plug-in	502211
IP65/IP67	◆	◆	-	-	Plug-in	502220
IP65/IP67	◆	◆	◆	-	Plug-in	502221
IP65/IP67	◆	◆	◆	◆	Plug-in	502224
IP69k	◆	◆	-	-	5 m cable	502226
IP69k	◆	◆	-	-	10 m cable	502227
IP69k	◆	◆	-	◆	10 m cable	502250
IP65/IP67	◆	◆	-	-	Plug-in	503220
IP65/IP67	◆	◆	◆	-	Plug-in	503221
IP65/IP67	◆	◆	◆	◆	Plug-in	503224

¹⁾ Order number for safety switch and actuator (one unit).



Technical documentation on safety switches PSEnmag:

Webcode 0357

Online information at www.pitz.com



▶ PSENcode non-contact, coded safety switch



PSEN cs1.1p

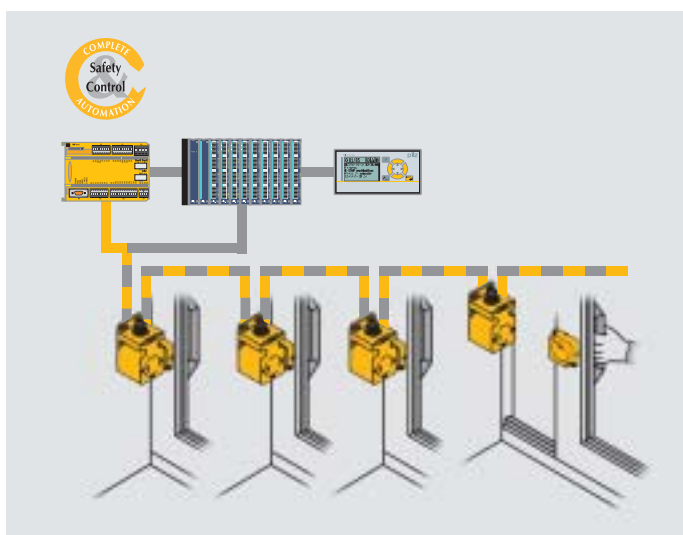
... with the key lock principle

A requirement of EN 1088 is that guards have guaranteed protection against manipulation. If non-coded sensors are used, designers are required to guarantee this through concealed installation. With PSENcode, protection against manipulation is built into the switch.

The safety switch and actuator work together in such a way that the enable from the safety device is only triggered if the actuating element is within the switch's response range and the code number on the actuator matches that of the switch.

Two versions of this key lock principle are available: one for use with any actuator or one with an actuator that is uniquely assigned to the PSENcode.

PSENcode safety switches offer a complete, co-ordinated solution that's economical and safe, with BG approval in accordance with EN 60947-5-3 for applications up to Performance Level e of EN ISO 13849-1 and SIL 3 of IEC 62061, or up to Category 4 of EN 954-1.



Connecting several PSENcode in series, up to Category 4.

Series connection with PSENcode up to Category 4 of EN 954-1

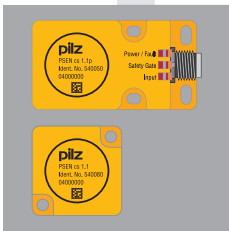
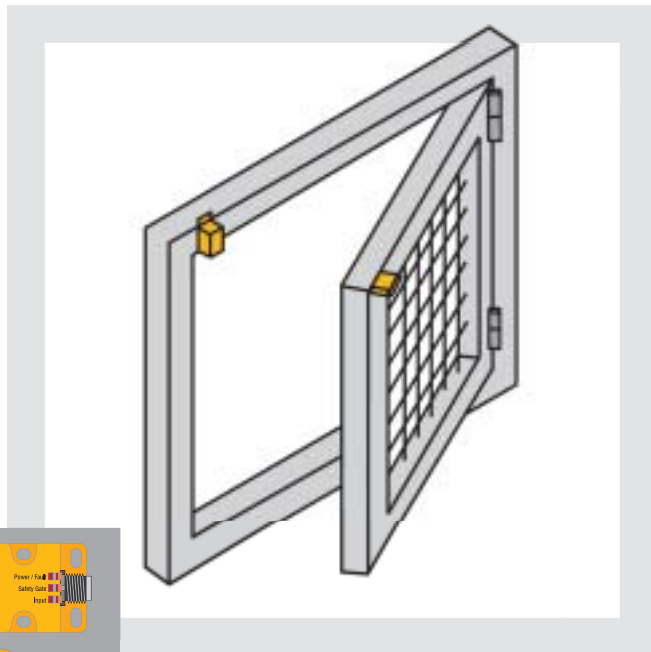
Connect more than ten PSENcode safety switches in series and you can achieve up to Category 4 in accordance with EN 954-1. For simpler applications you can also combine mechanical switches (Cat. 3) in series.

Keep up-to-date
on safety switches
PSENcode:

 Webcode 0365

Online information
at www.pilz.com

ches



Your benefits at a glance

- ▶ Highest level of manipulation protection via coding of switch and counterpart
- ▶ Long product service life as it is mechanically non-wearing
- ▶ Insensitive to shock and vibration
- ▶ Can also be used where there is heavy soiling and where strict hygiene regulations are in place, as the housing is insensitive to dirt, dust-tight and waterproof to IP67



Selection guide – PSENcode non-contact coded safety switches



PSEN cs 1.1p

Type	Coding type	Assured switching distance	ATEX	Order number ¹⁾
PSEN cs1.1p	Coded	s _{ao} = 15 mm	-	540 000
PSEN cs1.13p	Coded	s _{ao} = 15 mm	◆	540 005
PSEN cs2.1p	Fully coded	s _{ao} = 15 mm	-	540 100 ²⁾
PSEN cs2.13p	Fully coded	s _{ao} = 15 mm	◆	540 105 ²⁾
PSEN cs2.2p	Unique, fully coded	s _{ao} = 15 mm	-	540 200 ³⁾

¹⁾ Order number for safety switch and actuator (one unit).

²⁾ Possible to teach-in a spare actuator up to 8 times.

³⁾ Unique assignment of safety switch and an actuator via coding.

Common features

- ▶ Safety switches for monitoring the position of movable guards in accordance with EN 60947-5-3
- ▶ Mode of operation: Transponder technology (non-magnetic action principle)
- ▶ Directions of actuation: 5
- ▶ Diagnostic interface with 3 LEDs
- ▶ Connection type: M12 connector, 8 pin
- ▶ Protection types IP65 and IP67
- ▶ Approved for safe applications in conjunction with all Pilz evaluation devices, up to Performance Level e of EN ISO 13849-1 and SIL 3 of IEC 62061, or up to Category 4 of EN 954-1
- ▶ Series connection approved up to Category 4 of EN 954-1
- ▶ ATEX approval



► Safety bolt PSEnbolt



PSEnbolt

Longer service life for the integrated safety switch

PSEnbolt safety bolts are used in conjunction with safety switches. The actuator is mechanically guided into the actuator head of the safety switch. This guarantees that the actuator is inserted correctly into the safety switch when the guard is closed. At the same time it provides mechanical protection for the switch.

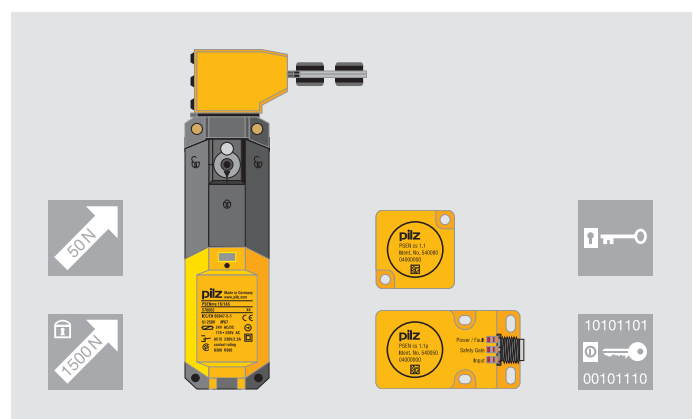
The safe, complete solution

Two applications can be implemented with just the one type: Guard locking in conjunction with PSEnmech or non-contact in conjunction with PSEncode.

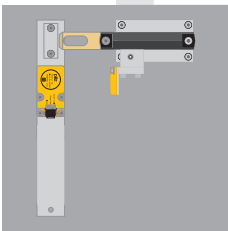
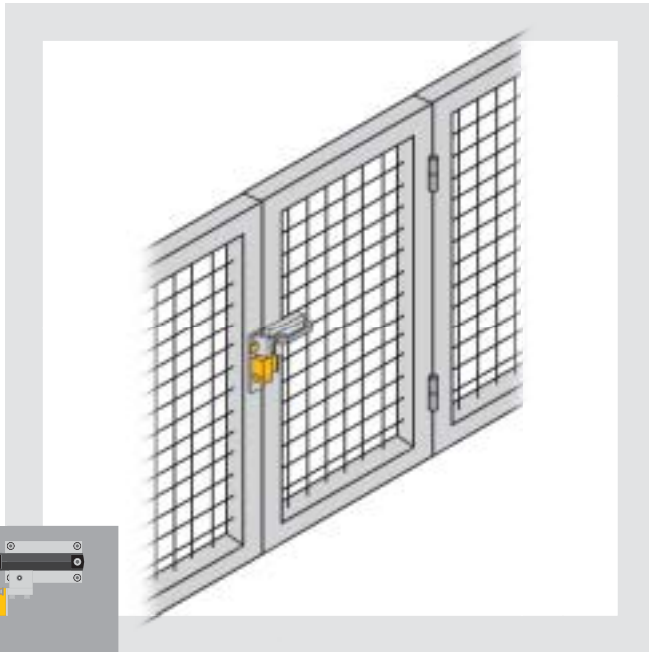
... for safety gates in a rugged industrial environment

According to the standard EN 1088, hazardous machine movements must be stopped when a guard is opened and a restart must be prevented. It must not be possible to either defeat (VDE 060) or manipulate (EN 1088) these guards.

For safety gates that are difficult to adjust or in areas where safety gates are opened and closed frequently, PSEnbolt is particularly suitable because a long material service life must be guaranteed as well as providing protection against defeat and manipulation.



PSEnbolt used with PSEnme1 and PSEncode.



Your benefits at a glance

- ▶ Safe, complete solution comprising safety switch, handle and bolt in conjunction with Pilz evaluation devices
- ▶ Two combinations are possible: with guard locking in conjunction with PSENmech or non-contact in conjunction with PSENcode
- ▶ Excellent protection against manipulation and defeat integrated within the bolt through coding of the safety switch PSENcode
- ▶ Emergency release available as an option
- ▶ Simple installation thanks to standard assembly holes
- ▶ Robust, cost-saving solution
- ▶ Suitable for left and right hinged gates

Selection guide – PSEnbolt safety bolt

Type	Can be combined with	Emergency release	Locking pin	Order number
PSEN b1	PSEN me1 or PSEN cs	-	-	540010
PSEN b2	PSEN me1 or PSEN cs	◆	◆	540020



Keep up-to-date on safety bolts PSEnbolt:

Webcode 0307

Online information at www.pilz.com



► Secure safety gate systems PSENSlock



PSENSlock

... for safety gate guarding

Strict safety regulations require health and safety measures to be safe from manipulation and defeat.

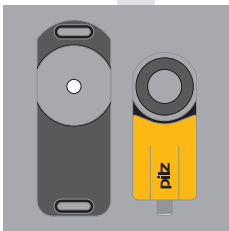
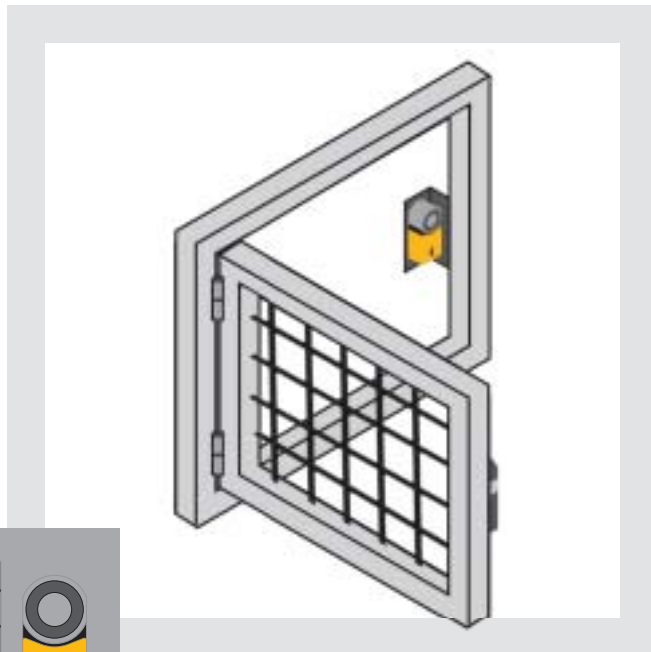
The new non-contact safety gate system PSENSlock from Pilz offers a safe alternative to existing mechanical technology. PSENSlock combines secure safety gate monitoring and a non-contact magnetic interlock within one unit.

With this combination of safe position monitoring and process guard locking, PSENSlock can be used universally for right or left-hinged swing gates and sliding gates, and is particularly suitable for use on movable guards.

With an electromagnetic holding force of 500 N, the PSENSlock prevents swing gates and sliding gates from being opened unintentionally. The actuator is manipulation-proof, providing added safety.

With its compact design, the process guard locking device is extremely suitable for mounting on to standard 45 mm profiles. PSENSlock is designed for applications up to SIL 3 in accordance with IEC 62061, Category 4 in accordance with EN 954-1 and protection type IP67. In terms of a complete solution, PSENSlock can be connected to all Pilz evaluation devices.





Your benefits at a glance

- ▶ Safe from manipulation thanks to proven transponder technology
- ▶ Tolerant to gate misalignment
- ▶ Long product service life as it is mechanically non-wearing
- ▶ Double-sided LEDs for left and right-hand installation
- ▶ Ideal for rugged industrial application as it is insensitive to dust and water

Keep up-to-date on secure safety gate systems PSENSlock:

Webcode 0219

Online information at www.pitz.com

Selection guide – Secure safety gate systems PSENSlock



PSEN sl-0.5p 1.1

Type	Holding force	Type of coding	Order number ¹⁾
PSEN sl-0.5p 1.1	500 N	Coded	570500
PSEN sl-0.5p 2.1	500 N	Fully coded	570501 ²⁾
PSEN sl-0.5p 2.2	500 N	Unique, fully coded	570502 ³⁾

Common features

- ▶ Mode of operation: Transponder technology (non-magnetic action principle)
- ▶ Diagnostic interface with 4 LEDs
- ▶ Connection type: M12 connector, 8 pin
- ▶ Protection type IP67

¹⁾ Including actuator (one unit)

²⁾ Possible to teach-in a spare actuator up to 8 times.

³⁾ Unique assignment to actuator via coding.



► Accessories – Safety switches and secure sa

PSENmag safety switch – Connection cable



PSEN cable

Type	Connector type	Length	Order number
PSEN cable - 4 pin M8 connector - Screw-on	Angled plug	2 m	533 110
	Angled plug	5 m	533 120
	Angled plug	10 m	533 130
	Angled plug	30 m	533 140
PSEN cable - 4 pin M8 connector - Screw-on	Straight plug	2 m	533 111
	Straight plug	5 m	533 121
	Straight plug	10 m	533 131
	Straight plug	30 m	533 141

PSENmag safety switch – Installation material



PSEN spacer



PSEN reverse spacer



PSEN bracket

Type	Suitable for	Number in pack (units)	Order number
PSEN spacer Spacer - Material: Plastic	► PSEN 1.1 ► PSEN 2.1	10	534 310
PSEN reverse spacer Reverse spacer - Material: Plastic	► PSEN 1.1 ► PSEN 2.1	2	534 320
PSEN bracket Mounting bracket - Material: Aluminium	► PSEN 1.1 ► PSEN 2.1	1	532 110

fety gate systems

PSENmag safety switch – Multiple interface for series connection



PSEN ix1



PSEN i1

Type	Description	Suitable for	Number in pack (units)	Order number
PSEN ix1 Multiple interface for PSEN 1 series	Can be used to connect to safety relays PNOZ X, PNOZsigma, PNOZmulti, PNOZpower and PSS programmable safety and control systems PSS ¹⁾ .	PSEN 1.1 PSEN 1.2 PSEN ma1.3	1	535 120
PSEN i1 Multiple interface for PSEN 2 series	Can be used to connect to safety relays PNOZelog and PNOZmulti plus PSS programmable safety and control systems ¹⁾ , with or without SafetyBUS p interface ¹⁾ .	PSEN 2.1 PSEN 2.2	1	535 110

¹⁾Please refer to the operating manual for further information.

Common features

- ▶ Diagnostic outputs to evaluate the switch status of the N/C circuits via external LEDs or a PLC
- ▶ Connection via cage clamp terminals

PSENcode safety switch and secure safety gate systems PSENslock – Connection cable



PSEN cable

Type	Connector type	Length	Order number
PSEN cable - 8-pin M12 female connector - Unshielded - Screw-on	Angled plug	3 m	540 322
	Angled plug	5 m	540 323
	Angled plug	10 m	540 324
	Angled plug	30 m	540 325
PSEN cable - 8-pin M12 female connector - Unshielded - Screw-on	Straight plug	3 m	540 319
	Straight plug	5 m	540 320
	Straight plug	10 m	540 321
	Straight plug	30 m	540 326

Technical documentation on accessories for safety switches and secure safety gate systems:

Webcode 0219

Online information at www.pilz.com



Product group
Optoelectronic protective devices
PSENopt and PSENopt SB

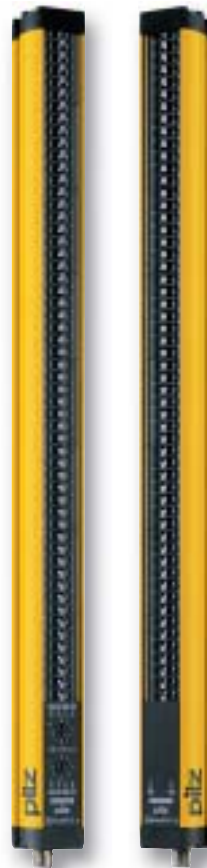
▶ Optoelectronic protective devices PSENopt



SafetyBUS p
The Safe Standard



PSENopt



PSENopt SB

**... to safeguard man
and machine without the
use of barriers**

Light beam devices, light curtains and light grids are all classed as electrosensitive protective equipment (ESPE). They are optoelectronic protective devices and are an effective, cost-saving alternative to conventional mechanical guards.

PSENopt devices are used to safeguard access to danger points, where the production process requires active intervention. An invisible protected field of infrared beams protects these zones. If a light beam is broken it will immediately trigger a safe shutdown command. In this way you can protect your staff from injury – safely and effectively, without causing an obstruction.



and PSENopt SB

PSENopt – for finger, hand and body protection

PSENopt light beam devices, light curtains and light grids with semiconductor outputs are suitable for all Type 2 and Type 4 applications in accordance with EN/IEC 61496-1/-2.

They are simple and quick to commission thanks to their integral alignment guide and compact dimensions. You can also save costs with integral functions such as muting, blanking and cascading. Read more from page 32.

PSENopt SB – for SafetyBUS p applications

The safe, open bus system SafetyBUS p is recommended for cost-effective monitoring of a large light grid application. And for this it's best to turn to the PSENopt SB.

Reduce the amount of work involved by using compatible system components and safeguard your staff in accordance with Type 4 of EN/IEC 61496-1/-2. You can save work on both installation and maintenance. Read more from page 48.

Select the right PSENopt to conform to the standard

Carry out a safety assessment in accordance with EN 954-1 and then assess the risk in accordance with EN/IEC 61496-1/-2. You can then use this information to work out the appropriate light grid resolution for your application, in accordance with EN 999.

Select the electro-sensitive protective device that best meets your needs. This will mean greater safety for finger, hand and body, compatible with a wide range of applications.



The appropriate PSENopt safety sensor for each application

Type	PSENopt	PSENopt SB
Interfaces	With semiconductor outputs	With SafetyBUS p interface
Resolution	Finger, hand, body protection as well as access protection	Finger, hand, body protection
For use in applications in accordance with EN 954-1	Category 2 and 4	Category 4
Approved in accordance with EN/IEC 61496-1/-2	Type 2/Type 4	Type 4
Functions/features	Muting (S/L/T or total/partial), blanking, cascading, feedback loop monitoring	Muting sensors, muting lamp, reset, acknowledgement, diagnostics
Height of protected field	150 ... 1,650 mm	300 ... 1,650 mm
Operating range	0.2 ... 50 m (depending on version)	0.2 ... 25 m (depending on version)
Light grid reaction time	333 µs ... 68 ms (depending on version)	55 ... 105 ms (depending on version)

Keep up-to-date on PSENopt:

Webcode 0311

Online information at www.pilz.com



▶ Greater productivity with ergonomic work

If the production process requires active intervention, there is a high potential risk. Mechanical guards can seriously disrupt the work cycle. Why not design workstations to be ergonomic and still provide effective protection for your staff.

PSENOpt light beam devices, light curtains and light grids offer greater productivity, while safeguarding access to the work process.

Save costs:

- ▶ PSENOpt devices have a compact design and therefore save space
- ▶ The product features of the PSENOpt mean they can quickly be incorporated, operated and maintained on your plant.
- ▶ Protected fields and detection capability can be set up to be process-oriented



Monitoring
high-bay racking
with PSENOpt for
access protection.



Monitoring
robots with PSENOpt
for hand protection.



Monitoring a
press with PSENOpt
for finger protection.

stations



Monitoring an assembly line with PSENopt for access protection.



Monitoring a plant with PSENopt for body protection.

PSENopt for all industries and applications

Muting, blanking and/or cascading open up a range of possibilities for optimum incorporation of PSENopt into your plant. So they are suitable for all industries and applications:

- ▶ Presses and punch machines
- ▶ Folding and cutting machines
- ▶ Machining centres
- ▶ Robot systems
- ▶ Assembly stations
- ▶ Assembly lines
- ▶ Transport and conveyor systems
- ▶ High-bay racking
- ▶ Packaging machines
- ▶ Injection moulding machines
- ▶ Wood, leather, ceramics and textile processing machines

SafetyBUS p
the safe standard

SafetyNET p

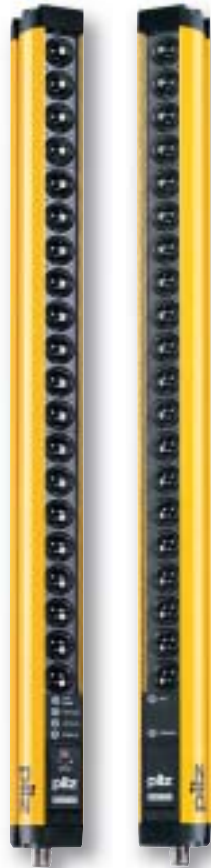
Keep up-to-date on our work in specific industries:

 Webcode 0683

Online information at www.pilz.com



▶ PSENopt light beam devices, light curtains and



PSENopt

... for finger, hand and body protection

Thanks to compact dimensions, simple installation technology and optimum performance, PSENopt devices are particularly suitable for applications in areas where an ergonomic work environment is an absolute must. For example, where operator intervention is required as part of each cycle, such as insertion work, or the infeed and outfeed of material.

Muting to distinguish between a person and material

PSENopt devices with muting function are suitable for transporting material into and out of a danger zone, when loading or unloading pallets for example. Muting is the safe, automatic and temporary suspension of a protection device. Various models are available as a linear version, or with integral muting sensors in the L-Version and in the T-Version.



Muting in one/two directions
(L-Version and T-Version)

Cascading function for effective protection against encroachment into and behind the protected area

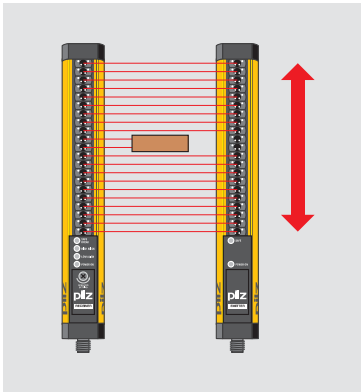
Adjacent protected fields can easily be safeguarded. Just connect master and slave using a simple plug-in connector; it's fast and uncomplicated. The individual entities have the same test and diagnostic procedure. This type of cascading enables the front, top and back of a machine to be safeguarded using just a single light curtain system.

The cascade configuration also enables you to combine the function of two pairs of light curtains. This provides effective protection against encroachment into and behind the protected area, for example.

Feedback loop function for small, local plants

PSENopt can be used to implement a cost-effective solution for small, local plants that have no additional safety-related connections. Safety relays or contactors may be connected to the semi-conductor outputs. The switch status of the contactors is safely monitored via the feedback loop function.

light grids with semiconductor outputs



Floating blanking: Two beams are blanked out. Any objects that obscure more than two beams will be detected.

Blanking for a flexible, uninterrupted production process

You can use the blanking function to blank out a defined area of the light grid. The safety function will not be triggered when the material to be processed passes through. Blanking can be implemented in two different ways: fixed blanking and floating blanking.

Your benefits at a glance

- ▶ Complete solution that's economical, approved and safe, in conjunction with compatible Pilz evaluation devices
- ▶ Maximum safety because they are tested and approved
- ▶ Integrated add-on functions: muting, blanking, cascading and feedback loop monitoring
- ▶ Rapid installation and simple maintenance due to simple connection technology



The appropriate PSENopt optoelectronic protective devices for each application

Type	Light beam devices	Light curtains		Light grids
Resolution/ No. of beams	Access protection (1 beam)	Finger protection (14 mm)	Hand protection (30 mm)	Body protection (2 ... 4 beams)
Height of protected field	-	150 ... 1,200 mm	150 ... 1,650 mm	500 ... 1,200 mm
Operating range	Up to 8/40 m	0.2 ... 6 m	0.2 ... 15 m	0.5 ... 25 m
PSENopt reaction time	320 µs/1.5 ms	14.3 ... 68 ms	11.9 ... 68 ms	14 ms
Product type in accordance with EN/IEC 61546-1/-2				
- Type 2	▶ PSEN op2S ¹⁾	-	▶ PSEN op2H	▶ PSEN op2B (muting, total/partial)
- Type 4	▶ PSEN op4S ¹⁾	<ul style="list-style-type: none"> ▶ Muting PSEN op4F ▶ Standard PSEN op4F-s ▶ Blanking PSEN op4F-b ▶ Cascading PSEN op4F-m/-bm/-sl 	<ul style="list-style-type: none"> ▶ Muting PSEN op4H ▶ Standard PSEN op4H-s ▶ Blanking PSEN op4H-b ▶ Cascading PSEN op4H-m/-bm/-sl 	▶ Muting PSEN op4B-S/-L/-T

Keep up-to-date on PSENopt light beam devices, light curtains and light grids:

Webcode 0337

Online information at www.pilz.com

¹⁾ In conjunction with electronic evaluation devices. We recommend the PNOZmulti modular safety system or PSS programmable safety and control systems/SafetyBUS p.



▶ Selection guide – PSENopt light beam devices, light

PSEN op2S/4S light beam devices

Common features

- ▶ Compliant and approved in accordance with EN/IEC 61496-1/-2:
- ▶ In conjunction with
 - PNOZmulti modular safety system: PNOZ m0p, PNOZ m1p, PNOZ m2p
 - PSS programmable safety and control system: PSS DI2OT



Type	Approved to EN/IEC 61496-1/-2
PSEN op2S-1-1	Type 2
PSEN op4H-1-1	Type 4
PSEN op4S-1-2	Type 4

PSEN op2H, PSEN op2B light curtains, light grids (total/partial muting)

Common features

- ▶ Compliant and approved in accordance with EN/IEC 61508
- ▶ Approved in accordance with EN/IEC 61496-1/-2: Type 2
- ▶ Can be used in applications in accordance with Category 2 of EN 954-1 for hand and body protection
- ▶ Integral functions: Muting (total/partial), PSEN op2B only
- ▶ Function selection: Test, override (PSEN op2B only), via DIP switches:
 - Automatic reset (PSEN op2H)
 - Manual/automatic reset (PSEN op2B)
 - Total/partial muting (PSEN op2B)
- ▶ Semiconductor outputs
- ▶ Supply voltage: 24 VDC
- ▶ Connection:
 - PSEN op2H: Receiver Rx: M12, 5-pin; Emitter Tx: M12, 4-pin
 - PSEN op2B: Receiver Rx: M12, 8-pin; Emitter Tx: M12, 4-pin



PSEN op2H-30



PSEN op2B-30

Type	Approved to EN/IEC 61496-1/-2
PSEN op2H-30-015	Type 2
PSEN op2H-30-030	Type 2
PSEN op2H-30-045	Type 2
PSEN op2H-30-060	Type 2
PSEN op2H-30-075	Type 2
PSEN op2H-30-090	Type 2
PSEN op2H-30-105	Type 2
PSEN op2H-30-120	Type 2
PSEN op2H-30-135	Type 2
PSEN op2H-30-150	Type 2
PSEN op2B-2-050	Type 2
PSEN op2B-3-080	Type 2
PSEN op2B-4-090	Type 2
PSEN op2B-4-120	Type 2

curtains, light grids with semiconductor outputs

Resolution/ No. of beams	Features/ functions	Operating range	PSENopt reaction time	Design	Order number
Access protection (1)	Infrared	0 ... 8 m	1.5 ms max.	M18	630380
Access protection (1)	Infrared	0 ... 8 m	1.5 ms max.	M18	630381
Access protection (1)	Laser	0 ... 40 m	320 µs max.	M18	630382



Resolution/ No. of beams	Height of protected field	Operating range	PSENopt reaction time	Dimensions	Order number
Hand (30 mm)	150 mm	0.2 ... 15 m	14 ms	31 x 32 mm	630100
Hand (30 mm)	300 mm	0.2 ... 15 m	15 ms	31 x 32 mm	630101
Hand (30 mm)	450 mm	0.2 ... 15 m	16 ms	31 x 32 mm	630102
Hand (30 mm)	600 mm	0.2 ... 15 m	17 ms	31 x 32 mm	630103
Hand (30 mm)	750 mm	0.2 ... 15 m	18 ms	31 x 32 mm	630104
Hand (30 mm)	900 mm	0.2 ... 15 m	19 ms	31 x 32 mm	630105
Hand (30 mm)	1,050 mm	0.2 ... 15 m	20 ms	31 x 32 mm	630106
Hand (30 mm)	1,200 mm	0.2 ... 15 m	22 ms	31 x 32 mm	630107
Hand (30 mm)	1,350 mm	0.2 ... 15 m	23 ms	31 x 32 mm	630108
Hand (30 mm)	1,500 mm	0.2 ... 15 m	24 ms	31 x 32 mm	630109
Body (2)	500 mm	0.5 ... 50 m	14 ms	35 x 40 mm	630200
Body (3)	800 mm	0.5 ... 50 m	14 ms	35 x 40 mm	630201
Body (4)	900 mm	0.5 ... 50 m	14 ms	35 x 40 mm	630202
Body (4)	1,200 mm	0.5 ... 50 m	14 ms	35 x 40 mm	630203

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PSENopt:

Webcode 0337

Cable and other accessories can be found from page 52.

Online information
at www.pilz.com



▶ Selection guide – PSENopt light curtains with

PSEN op4F-s/4H-s light curtains (feedback loop monitoring)

Common features

- ▶ Compliant and approved in accordance with EN/IEC 61508
- ▶ Approved in accordance with EN/IEC 61496-1/-2: Type 4
- ▶ Can be used in applications in accordance with Category 2/ Category 4 of EN 954-1 for finger and hand protection
- ▶ Integral functions:
 - Feedback loop monitoring
- ▶ Function selection:
 - Test, via DIP switches:
 - Manual/automatic reset,
 - feedback loop monitoring
- ▶ Semiconductor outputs
- ▶ Supply voltage: 24 VDC
- ▶ Connection:
 - PSEN op4:
 - Receiver Rx: M12, 8-pin
 - Emitter Tx: M12, 4-pin



PSEN op4F-s-14



PSEN op4H-s-30

Type	Approved to EN/IEC 61496-1/-2
PSEN op4F-s-14-015	Type 4
PSEN op4F-s-14-030	Type 4
PSEN op4F-s-14-045	Type 4
PSEN op4F-s-14-060	Type 4
PSEN op4F-s-14-075	Type 4
PSEN op4F-s-14-090	Type 4
PSEN op4F-s-14-105	Type 4
PSEN op4F-s-14-120	Type 4
PSEN op4H-s-30-015	Type 4
PSEN op4H-s-30-030	Type 4
PSEN op4H-s-30-045	Type 4
PSEN op4H-s-30-060	Type 4
PSEN op4H-s-30-075	Type 4
PSEN op4H-s-30-090	Type 4
PSEN op4H-s-30-105	Type 4
PSEN op4H-s-30-120	Type 4
PSEN op4H-s-30-135	Type 4
PSEN op4H-s-30-150	Type 4
PSEN op4H-s-30-165	Type 4

semiconductor outputs

Resolution/ No. of beams	Height of protected field	Operating range	PSENopt reaction time	Dimensions	Order number
Finger (14 mm)	150 mm	0.2 ... 6 m	14 ms	35 x 40 mm	630600
Finger (14 mm)	300 mm	0.2 ... 6 m	18 ms	35 x 40 mm	630601
Finger (14 mm)	450 mm	0.2 ... 6 m	22 ms	35 x 40 mm	630602
Finger (14 mm)	600 mm	0.2 ... 6 m	26 ms	35 x 40 mm	630603
Finger (14 mm)	750 mm	0.2 ... 6 m	30 ms	35 x 40 mm	630604
Finger (14 mm)	900 mm	0.2 ... 6 m	34 ms	35 x 40 mm	630605
Finger (14 mm)	1,050 mm	0.2 ... 6 m	38 ms	35 x 40 mm	630606
Finger (14 mm)	1,200 mm	0.2 ... 6 m	41 ms	35 x 40 mm	630607
Hand (30 mm)	150 mm	0.2 ... 15 m	12 ms	35 x 40 mm	630610
Hand (30 mm)	300 mm	0.2 ... 15 m	13 ms	35 x 40 mm	630611
Hand (30 mm)	450 mm	0.2 ... 15 m	15 ms	35 x 40 mm	630612
Hand (30 mm)	600 mm	0.2 ... 15 m	16 ms	35 x 40 mm	630613
Hand (30 mm)	750 mm	0.2 ... 15 m	18 ms	35 x 40 mm	630614
Hand (30 mm)	900 mm	0.2 ... 15 m	19 ms	35 x 40 mm	630615
Hand (30 mm)	1,050 mm	0.2 ... 15 m	21 ms	35 x 40 mm	630616
Hand (30 mm)	1,200 mm	0.2 ... 15 m	22 ms	35 x 40 mm	630617
Hand (30 mm)	1,350 mm	0.2 ... 15 m	24 ms	35 x 40 mm	630618
Hand (30 mm)	1,500 mm	0.2 ... 15 m	25 ms	35 x 40 mm	630619
Hand (30 mm)	1,650 mm	0.2 ... 15 m	26 ms	35 x 40 mm	630620

Cable and other accessories can be found from page 52.



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▶ Selection guide – PSENopt light curtains with

PSEN op4F-b/4H-b light curtains (blanking, feedback loop monitoring)

Common features

- ▶ Compliant and approved in accordance with EN/IEC 61508
- ▶ Approved in accordance with EN/IEC 61496-1/-2: Type 4
- ▶ Can be used in applications in accordance with Category 2/ Category 4 of EN 954-1 for finger and hand protection
- ▶ Integral functions:
Blanking, feedback loop monitoring
- ▶ Function selection:
Test, via DIP switches:
Manual/automatic reset, feedback loop monitoring, floating, blanking
- ▶ Semiconductor outputs
- ▶ Supply voltage: 24 VDC
- ▶ Connection:
- PSEN op4:
Receiver Rx: M12, 8-pin
Emitter Tx: M12, 4-pin



PSEN op4F-b-14



PSEN op4H-b-30

Type	Approved to EN/IEC 61496-1/-2
PSEN op4F-b-14-015	Type 4
PSEN op4F-b-14-030	Type 4
PSEN op4F-b-14-045	Type 4
PSEN op4F-b-14-060	Type 4
PSEN op4F-b-14-075	Type 4
PSEN op4F-b-14-090	Type 4
PSEN op4F-b-14-105	Type 4
PSEN op4F-b-14-120	Type 4
PSEN op4H-b-30-015	Type 4
PSEN op4H-b-30-030	Type 4
PSEN op4H-b-30-045	Type 4
PSEN op4H-b-30-060	Type 4
PSEN op4H-b-30-075	Type 4
PSEN op4H-b-30-090	Type 4
PSEN op4H-b-30-105	Type 4
PSEN op4H-b-30-120	Type 4
PSEN op4H-b-30-135	Type 4
PSEN op4H-b-30-150	Type 4
PSEN op4H-b-30-165	Type 4

semiconductor outputs

Resolution/ No. of beams	Height of protected field	Operating range	PSENopt reaction time	Dimensions	Order number
Finger (14 mm)	150 mm	0.2 ... 6 m	21 ms	35 x 40 mm	630621
Finger (14 mm)	300 mm	0.2 ... 6 m	28 ms	35 x 40 mm	630622
Finger (14 mm)	450 mm	0.2 ... 6 m	35 ms	35 x 40 mm	630623
Finger (14 mm)	600 mm	0.2 ... 6 m	41 ms	35 x 40 mm	630624
Finger (14 mm)	750 mm	0.2 ... 6 m	48 ms	35 x 40 mm	630625
Finger (14 mm)	900 mm	0.2 ... 6 m	55 ms	35 x 40 mm	630626
Finger (14 mm)	1,050 mm	0.2 ... 6 m	62 ms	35 x 40 mm	630627
Finger (14 mm)	1,200 mm	0.2 ... 6 m	68 ms	35 x 40 mm	630628
Hand (30 mm)	150 mm	0.2 ... 15 m	16 ms	35 x 40 mm	630630
Hand (30 mm)	300 mm	0.2 ... 15 m	20 ms	35 x 40 mm	630631
Hand (30 mm)	450 mm	0.2 ... 15 m	23 ms	35 x 40 mm	630632
Hand (30 mm)	600 mm	0.2 ... 15 m	25 ms	35 x 40 mm	630633
Hand (30 mm)	750 mm	0.2 ... 15 m	27 ms	35 x 40 mm	630634
Hand (30 mm)	900 mm	0.2 ... 15 m	30 ms	35 x 40 mm	630635
Hand (30 mm)	1,050 mm	0.2 ... 15 m	32 ms	35 x 40 mm	630636
Hand (30 mm)	1,200 mm	0.2 ... 15 m	35 ms	35 x 40 mm	630637
Hand (30 mm)	1,350 mm	0.2 ... 15 m	38 ms	35 x 40 mm	630638
Hand (30 mm)	1,500 mm	0.2 ... 15 m	40 ms	35 x 40 mm	630639
Hand (30 mm)	1,650 mm	0.2 ... 15 m	43 ms	35 x 40 mm	630640

Cable and other accessories can be found from page 52.



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▶ Selection guide – PSENopt light curtains with

PSEN op4F-m/4H-m light curtains (cascading (master), feedback loop monitoring)

Common features

- ▶ Compliant and approved in accordance with EN/IEC 61508
- ▶ Approved in accordance with EN/IEC 61496-1/-2: Type 4
- ▶ Can be used in applications in accordance with Category 2/ Category 4 of EN 954-1 for finger and hand protection
- ▶ Integral functions: Cascading, feedback loop monitoring
- ▶ Function selection: Test, via DIP switches: Manual/automatic reset, feedback loop monitoring
- ▶ Semiconductor outputs
- ▶ Supply voltage: 24 VDC
- ▶ Connection:
 - PSEN op4: Receiver Rx: M12, 8-pin
Emitter Tx: M12, 4-pin
Slave: M12, 5-pin



PSEN op4F-m-14



PSEN op4H-m-30

Type	Approved to EN/IEC 61496-1/-2
PSEN op4F-m-14-015	Type 4
PSEN op4F-m-14-030	Type 4
PSEN op4F-m-14-045	Type 4
PSEN op4F-m-14-060	Type 4
PSEN op4F-m-14-075	Type 4
PSEN op4F-m-14-090	Type 4
PSEN op4F-m-14-105	Type 4
PSEN op4F-m-14-120	Type 4
PSEN op4H-m-30-015	Type 4
PSEN op4H-m-30-030	Type 4
PSEN op4H-m-30-045	Type 4
PSEN op4H-m-30-060	Type 4
PSEN op4H-m-30-075	Type 4
PSEN op4H-m-30-090	Type 4
PSEN op4H-m-30-105	Type 4
PSEN op4H-m-30-120	Type 4
PSEN op4H-m-30-135	Type 4
PSEN op4H-m-30-150	Type 4
PSEN op4H-m-30-165	Type 4

semiconductor outputs

Resolution/ No. of beams	Height of protected field	Operating range	PSENopt reaction time	Dimensions	Order number
Finger (14 mm)	150 mm	0.2 ... 6 m	21 ms	35 x 40 mm	630641
Finger (14 mm)	300 mm	0.2 ... 6 m	28 ms	35 x 40 mm	630642
Finger (14 mm)	450 mm	0.2 ... 6 m	35 ms	35 x 40 mm	630643
Finger (14 mm)	600 mm	0.2 ... 6 m	41 ms	35 x 40 mm	630644
Finger (14 mm)	750 mm	0.2 ... 6 m	48 ms	35 x 40 mm	630645
Finger (14 mm)	900 mm	0.2 ... 6 m	55 ms	35 x 40 mm	630646
Finger (14 mm)	1,050 mm	0.2 ... 6 m	62 ms	35 x 40 mm	630647
Finger (14 mm)	1,200 mm	0.2 ... 6 m	68 ms	35 x 40 mm	630648
Hand (30 mm)	150 mm	0.2 ... 15 m	16 ms	35 x 40 mm	630650
Hand (30 mm)	300 mm	0.2 ... 15 m	20 ms	35 x 40 mm	630651
Hand (30 mm)	450 mm	0.2 ... 15 m	23 ms	35 x 40 mm	630652
Hand (30 mm)	600 mm	0.2 ... 15 m	25 ms	35 x 40 mm	630653
Hand (30 mm)	750 mm	0.2 ... 15 m	27 ms	35 x 40 mm	630654
Hand (30 mm)	900 mm	0.2 ... 15 m	30 ms	35 x 40 mm	630655
Hand (30 mm)	1,050 mm	0.2 ... 15 m	32 ms	35 x 40 mm	630656
Hand (30 mm)	1,200 mm	0.2 ... 15 m	35 ms	35 x 40 mm	630657
Hand (30 mm)	1,350 mm	0.2 ... 15 m	38 ms	35 x 40 mm	630658
Hand (30 mm)	1,500 mm	0.2 ... 15 m	40 ms	35 x 40 mm	630659
Hand (30 mm)	1,650 mm	0.2 ... 15 m	43 ms	35 x 40 mm	630660

Cable and other accessories can be found from page 52.



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▶ Selection guide – PSENopt light curtains with

PSEN op4F-bm/4H-bm light curtains, light grids (cascading (master), blanking, feedback loop monitoring)

Common features

- ▶ Compliant and approved in accordance with EN/IEC 61508
- ▶ Approved in accordance with EN/IEC 61496-1/-2: Type 4
- ▶ Can be used in applications in accordance with Category 2/ Category 4 of EN 954-1 for finger and hand protection
- ▶ Integral functions: Blanking, cascading, feedback loop monitoring
- ▶ Function selection: Test, via DIP switches: Manual/automatic reset, feedback loop monitoring
- ▶ Semiconductor outputs
- ▶ Supply voltage: 24 VDC
- ▶ Connection:
 - PSEN op4: Receiver Rx: M12, 8-pin
Emitter Tx: M12, 4-pin
Slave: M12, 5-pin



PSEN op4F-bm-14



PSEN op4H-bm-30

Type	Approved to EN/IEC 61496-1/-2
PSEN op4F-bm-14-015	Type 4
PSEN op4F-bm-14-030	Type 4
PSEN op4F-bm-14-045	Type 4
PSEN op4F-bm-14-060	Type 4
PSEN op4F-bm-14-075	Type 4
PSEN op4F-bm-14-090	Type 4
PSEN op4F-bm-14-105	Type 4
PSEN op4F-bm-14-120	Type 4
PSEN op4H-bm-30-015	Type 4
PSEN op4H-bm-30-030	Type 4
PSEN op4H-bm-30-045	Type 4
PSEN op4H-bm-30-060	Type 4
PSEN op4H-bm-30-075	Type 4
PSEN op4H-bm-30-090	Type 4
PSEN op4H-bm-30-105	Type 4
PSEN op4H-bm-30-120	Type 4
PSEN op4H-bm-30-135	Type 4
PSEN op4H-bm-30-150	Type 4
PSEN op4H-bm-30-165	Type 4

semiconductor outputs

Resolution/ No. of beams	Height of protected field	Operating range	PSENopt reaction time	Dimensions	Order number
Finger (14 mm)	150 mm	0.2 ... 6 m	21 ms	35 x 40 mm	630661
Finger (14 mm)	300 mm	0.2 ... 6 m	28 ms	35 x 40 mm	630662
Finger (14 mm)	450 mm	0.2 ... 6 m	35 ms	35 x 40 mm	630663
Finger (14 mm)	600 mm	0.2 ... 6 m	41 ms	35 x 40 mm	630664
Finger (14 mm)	750 mm	0.2 ... 6 m	48 ms	35 x 40 mm	630665
Finger (14 mm)	900 mm	0.2 ... 6 m	55 ms	35 x 40 mm	630666
Finger (14 mm)	1,050 mm	0.2 ... 6 m	62 ms	35 x 40 mm	630667
Finger (14 mm)	1,200 mm	0.2 ... 6 m	68 ms	35 x 40 mm	630668
Hand (30 mm)	150 mm	0.2 ... 15 m	16 ms	35 x 40 mm	630670
Hand (30 mm)	300 mm	0.2 ... 15 m	20 ms	35 x 40 mm	630671
Hand (30 mm)	450 mm	0.2 ... 15 m	23 ms	35 x 40 mm	630672
Hand (30 mm)	600 mm	0.2 ... 15 m	25 ms	35 x 40 mm	630673
Hand (30 mm)	750 mm	0.2 ... 15 m	27 ms	35 x 40 mm	630674
Hand (30 mm)	900 mm	0.2 ... 15 m	30 ms	35 x 40 mm	630675
Hand (30 mm)	1,050 mm	0.2 ... 15 m	32 ms	35 x 40 mm	630676
Hand (30 mm)	1,200 mm	0.2 ... 15 m	35 ms	35 x 40 mm	630677
Hand (30 mm)	1,350 mm	0.2 ... 15 m	38 ms	35 x 40 mm	630678
Hand (30 mm)	1,500 mm	0.2 ... 15 m	40 ms	35 x 40 mm	630679
Hand (30 mm)	1,650 mm	0.2 ... 15 m	43 ms	35 x 40 mm	630680

Cable and other accessories can be found from page 52.



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▶ Selection guide – PSENopt light curtains with

PSEN op4F-sl/4H-sl light curtains (cascading (slave))

Common features

- ▶ Compliant and approved in accordance with EN/IEC 61508
- ▶ Approved in accordance with EN/IEC 61496-1/-2: Type 4
- ▶ Can be used in applications in accordance with Category 2/ Category 4 of EN 954-1 for finger and hand protection
- ▶ Integral functions: Cascading, feedback loop monitoring
- ▶ Function selection: Test, via DIP switches: Manual/automatic reset, feedback loop monitoring
- ▶ Semiconductor outputs
- ▶ Supply voltage: 24 VDC
- ▶ Connection:
 - PSEN op4: Receiver Rx: M12, 5-pin
Emitter Tx: M12, 4-pin



PSEN op4F-sl-14



PSEN op4H-sl-30

Type	Approved to EN/IEC 61496-1/-2
PSEN op4F-sl-14-015	Type 4
PSEN op4F-sl-14-030	Type 4
PSEN op4F-sl-14-045	Type 4
PSEN op4F-sl-14-060	Type 4
PSEN op4F-sl-14-075	Type 4
PSEN op4F-sl-14-090	Type 4
PSEN op4F-sl-14-105	Type 4
PSEN op4F-sl-14-120	Type 4
PSEN op4H-sl-30-015	Type 4
PSEN op4H-sl-30-030	Type 4
PSEN op4H-sl-30-045	Type 4
PSEN op4H-sl-30-060	Type 4
PSEN op4H-sl-30-075	Type 4
PSEN op4H-sl-30-090	Type 4
PSEN op4H-sl-30-105	Type 4
PSEN op4H-sl-30-120	Type 4
PSEN op4H-sl-30-135	Type 4
PSEN op4H-sl-30-150	Type 4
PSEN op4H-sl-30-165	Type 4

PSEN op4B-S/-L/-T light grid

Common features

- ▶ Compliant and approved in accordance with EN/IEC 61508
- ▶ Approved in accordance with EN/IEC 61496-1/-2: Type 4
- ▶ Can be used in applications in accordance with Category 4 of EN 954-1 for body protection
- ▶ With integrated sensors and muting lamps
- ▶ L-Muting or T-Muting
- ▶ Linear model for external muting sensors



PSEN opB-T

Type	Resolution, No. of beams (body)
PSEN op4B-S-2-050	515 mm, 2 beams
PSEN op4B-S-3-080	415 mm, 3 beams
PSEN op4B-L-2-050	515 mm, 2 beams
PSEN op4B-L-3-080	415 mm, 3 beams
PSEN op4B-T-2-050	515 mm, 2 beams
PSEN op4B-T-3-080	415 mm, 3 beams

semiconductor outputs

Resolution/ No. of beams	Height of protected field	Operating range	PSENopt reaction time	Dimensions	Order number
Finger (14 mm)	150 mm	0.2 ... 6 m	21 ms	35 x 40 mm	630681
Finger (14 mm)	300 mm	0.2 ... 6 m	28 ms	35 x 40 mm	630682
Finger (14 mm)	450 mm	0.2 ... 6 m	35 ms	35 x 40 mm	630683
Finger (14 mm)	600 mm	0.2 ... 6 m	41 ms	35 x 40 mm	630684
Finger (14 mm)	750 mm	0.2 ... 6 m	48 ms	35 x 40 mm	630685
Finger (14 mm)	900 mm	0.2 ... 6 m	55 ms	35 x 40 mm	630686
Finger (14 mm)	1,050 mm	0.2 ... 6 m	62 ms	35 x 40 mm	630687
Finger (14 mm)	1,200 mm	0.2 ... 6 m	68 ms	35 x 40 mm	630688
Hand (30 mm)	150 mm	0.2 ... 15 m	16 ms	35 x 40 mm	630690
Hand (30 mm)	300 mm	0.2 ... 15 m	20 ms	35 x 40 mm	630691
Hand (30 mm)	450 mm	0.2 ... 15 m	23 ms	35 x 40 mm	630692
Hand (30 mm)	600 mm	0.2 ... 15 m	25 ms	35 x 40 mm	630693
Hand (30 mm)	750 mm	0.2 ... 15 m	27 ms	35 x 40 mm	630694
Hand (30 mm)	900 mm	0.2 ... 15 m	30 ms	35 x 40 mm	630695
Hand (30 mm)	1,050 mm	0.2 ... 15 m	32 ms	35 x 40 mm	630696
Hand (30 mm)	1,200 mm	0.2 ... 15 m	35 ms	35 x 40 mm	630697
Hand (30 mm)	1,350 mm	0.2 ... 15 m	38 ms	35 x 40 mm	630698
Hand (30 mm)	1,500 mm	0.2 ... 15 m	40 ms	35 x 40 mm	630699
Hand (30 mm)	1,650 mm	0.2 ... 15 m	43 ms	35 x 40 mm	630700



Approved to EN/IEC 61496-1/-2	Features/ functions	Height of protected field	Operating range	PSENopt reaction time	Dimensions	Order number
Type 4	Linear version	400 mm	0.5 ... 25 m	14 ms	35 x 40 mm	630705
Type 4	Linear version	300 mm	0.5 ... 25 m	14 ms	35 x 40 mm	630706
Type 4	L-Version	400 mm	0.5 ... 3 m	14 ms	35 x 40 mm	630703
Type 4	L-Version	300 mm	0.5 ... 3 m	14 ms	35 x 40 mm	630704
Type 4	T-Version	400 mm	0.5 ... 3 m	14 ms	35 x 40 mm	630701
Type 4	T-Version	300 mm	0.5 ... 3 m	14 ms	35 x 40 mm	630702

Technical documentation on optoelectronic protective devices PSENopt:



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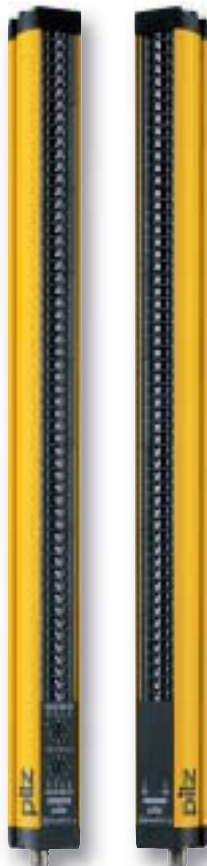
Cable and other accessories can be found from page 52.



▶ PSENopt SB light curtains and light grids with



SafetyBUS p
The Safe Standard



PSENopt SB

The safe, complete solution from one source

With PSENopt SB light curtains and light grids you have a product that is perfectly compatible with the safe, open bus system SafetyBUS p.

Simpler installation, fewer components

In cramped conditions, as is often the case where light curtains are installed, the space requirement and the number of required components takes on a totally different emphasis. To connect a classic light curtain it is necessary to consider an additional evaluation device plus IP67 installation.

With the bus interface integrated within the PSENopt SB, there is no need for any other external components.

All the settings relating to the light grids are stored centrally in the control system and are activated via SafetyBUS p. For the “partial muting” function for example, the individual active zones or zone combinations can be set via the PSS programmable control system. So if a device is exchanged, only the SafetyBUS p address needs to be set.

Diagnostics make all the difference!

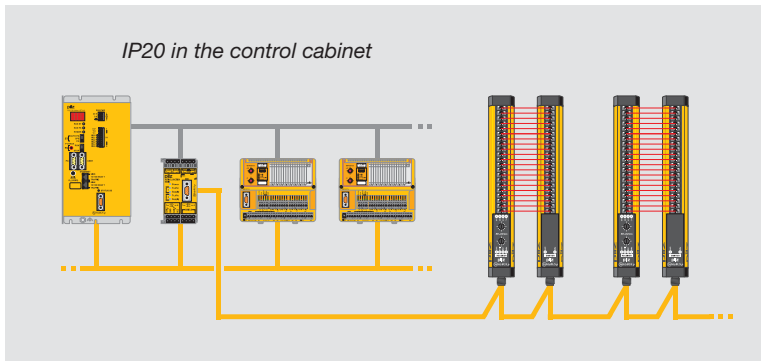
As with the transfer from a classic hard-wired relay-based safety circuit to a programmable safety and control system, the ability to diagnose fault conditions represents the key difference from a classic light curtain connection.

With an integrated SafetyBUS p interface, the diagnostics can send information to the PSS programmable safety and control system; for example, information on misalignment, contaminated signal, external light source, supply voltage status for the transmitter/receiver etc. As part of preventive maintenance, this diagnostic data helps to detect faults early, before they potentially cause the plant or machine to shut down.

Additional functions relating to the PSENopt SB

- ▶ Internal light grid functions:
 - OSSD (Output Signal Switching Device)
 - Diagnostics
 - Reset (local and from PSS)
 - Test (local and from PSS)
- ▶ Additional periphery functions, connected directly to the light curtain via 8-pin M12 connectors:
 - 2 x muting sensor
 - 1 x muting lamp

integral SafetyBUS p[®] interface



Field wiring = One-cable solution with IP67

Simpler form of cabling

When a light curtain is connected conventionally, not only is it necessary to connect its OSSD signals to the evaluation device, but the transmitter and receiver also require their own supply voltage.

Simpler cabling concepts can be employed by using a SafetyBUS p interface that's integrated within the light grid. This guarantees the connection of signals and supply with just one cable.

The basic element is a hybrid cable, which provides the supply voltage to the light curtains and also transmits the data signals from SafetyBUS p.

This ready-made one-cable solution offers numerous handling benefits in the IP67 area, as all manual connection work and PG cable feeds can be reduced to a minimum.

Your benefits at a glance

- ▶ Less work during installation:
 - Reduced space requirement for light grid and installation
 - Hybrid cable (one-cable solution) up to IP67
 - Connection via SafetyBUS p connectors
 - Simple parameter setting using the system's own programming software, PSS WIN-PRO
- ▶ Reduced downtimes during operation
 - Simpler troubleshooting thanks to extensive diagnostic data that can be evaluated directly from the controller
 - Units can be exchanged quickly due to centralised configuration and the ability to transfer all the settings
- ▶ Integrated muting function (local/global, partial/total)

PSENopt SB light curtains and light grids suitable for each requirement

Type	PSEN opSB-4F	PSEN opSB-4H	PSEN opSB-4B
Resolution/ No. of beams	Finger (14 mm)	Hand (30 mm)	Body (2 ... 4 beams)
Height of protected field	300 ... 900 mm	300 ... 1,650 mm	500 ... 1,200 mm
Operating range	0.2 ... 6 m	0.2 ... 15 m	0.5 ... 25 m
PSENopt SB reaction time	75 ... 105 ms	58 ... 84 ms	55 ms
Product type in accordance with EN/IEC 61546-1/-2	Type 4	Type 4	Type 4

Keep up-to-date
on light curtains
and light grids
PSENopt SB:

Webcode 0347

Online information
at www.pilz.com



▶ Selection guide – PSENopt SB light curtains,

PSENopt SB light curtains, light grids with SafetyBUS p interface

Common features

- ▶ Compliant and approved in accordance with EN/IEC 61508 and EN/IEC 61496-1/-2: Type 4
- ▶ Approved for applications up to Category 4 of EN 954-1 for finger, hand and body protection
- ▶ Integral functions:
 - ▶ Muting (total/partial)
 - ▶ Integral SafetyBUS p interface
 - ▶ Muting lamp can also be connected directly (may be monitored)
- ▶ Connection:
 - ▶ Receiver Rx: M12, 8-pin and 5-pin;
 - ▶ Emitter Tx: M12, 4-pin
- ▶ Supply voltage: 24 VDC



PSENopt SB-4F



PSENopt SB-4H



PSENopt SB-4B

Type	Approved to EN/IEC 61496-1/-2
PSENopt SB-4F-14-030	Type 4
PSENopt SB-4F-14-045	Type 4
PSENopt SB-4F-14-060	Type 4
PSENopt SB-4F-14-075	Type 4
PSENopt SB-4F-14-090	Type 4
PSENopt SB-4H-30-030	Type 4
PSENopt SB-4H-30-045	Type 4
PSENopt SB-4H-30-060	Type 4
PSENopt SB-4H-30-075	Type 4
PSENopt SB-4H-30-090	Type 4
PSENopt SB-4H-30-105	Type 4
PSENopt SB-4H-30-120	Type 4
PSENopt SB-4H-30-135	Type 4
PSENopt SB-4H-30-150	Type 4
PSENopt SB-4H-30-165	Type 4
PSENopt SB-4B-2-050	Type 4
PSENopt SB-4B-3-080	Type 4
PSENopt SB-4B-4-090	Type 4
PSENopt SB-4B-4-120	Type 4

light grids with SafetyBUS p[®] interface

Resolution/ No. of beams	Height of protected field	Operating range	PSENopt reaction time	Dimensions	Order number
Finger (14 mm)	300 mm	0.2 ... 6 m	75 ms	35 x 40 mm	630 351
Finger (14 mm)	450 mm	0.2 ... 6 m	82 ms	35 x 40 mm	630 352
Finger (14 mm)	600 mm	0.2 ... 6 m	90 ms	35 x 40 mm	630 353
Finger (14 mm)	750 mm	0.2 ... 6 m	97 ms	35 x 40 mm	630 354
Finger (14 mm)	900 mm	0.2 ... 6 m	105 ms	35 x 40 mm	630 355
Hand (30 mm)	300 mm	0.2 ... 15 m	58 ms	35 x 40 mm	630 451
Hand (30 mm)	450 mm	0.2 ... 15 m	61 ms	35 x 40 mm	630 452
Hand (30 mm)	600 mm	0.2 ... 15 m	64 ms	35 x 40 mm	630 453
Hand (30 mm)	750 mm	0.2 ... 15 m	67 ms	35 x 40 mm	630 454
Hand (30 mm)	900 mm	0.2 ... 15 m	70 ms	35 x 40 mm	630 455
Hand (30 mm)	1,050 mm	0.2 ... 15 m	72 ms	35 x 40 mm	630 456
Hand (30 mm)	1,200 mm	0.2 ... 15 m	75 ms	35 x 40 mm	630 457
Hand (30 mm)	1,350 mm	0.2 ... 15 m	78 ms	35 x 40 mm	630 458
Hand (30 mm)	1,500 mm	0.2 ... 15 m	81 ms	35 x 40 mm	630 459
Hand (30 mm)	1,650 mm	0.2 ... 15 m	84 ms	35 x 40 mm	630 460
Body (2)	500 mm	0.5 ... 25 m	55 ms	35 x 40 mm	630 550
Body (3)	800 mm	0.5 ... 25 m	55 ms	35 x 40 mm	630 551
Body (4)	900 mm	0.5 ... 25 m	55 ms	35 x 40 mm	630 552
Body (4)	1,200 mm	0.5 ... 25 m	55 ms	35 x 40 mm	630 553



Technical
documentation
on optoelectronic
protective devices
PSENopt SB:

Webcode 0347

Online information
at www.pilz.com



► Accessories – Optoelectronic protective de

PSENOpt optoelectronic protective devices – Connection cable



PSENOpt op cable

Type

PSENOpt op cable – Cable for light curtains/grids

- M12 coupling socket
- Connection: M12 connector, 4-pin
- Shielded



PSENOpt op cable for L-Muting

PSENOpt op cable – Cable for light curtains/grids

- M12 coupling socket
- Connection: M12 connector, 8-pin
- Shielded



PSENOpt op Y-cable

PSENOpt op cable – Cable for light beam devices/light curtains and muting sensors

- M12 coupling socket
- Connection: M12 connector, 4-pin
- Unshielded

PSENOpt op cable – Cable for light curtains

- M12 coupling socket
- Connection: M12 connector, 5-pin
- Unshielded



PSENOpt op connector

PSENOpt op cable – Cable for cascading light curtains/grids

- M12 coupling sockets
- Connection: M12 connector, 5-pin
- Shielded

PSENOpt op cable – Cable for L-Muting of light curtains

- M12 coupling sockets
- Connection: M12 connector, 4-pin
- Shielded

PSENOpt op cable – Y-cable for T-Muting of light curtains

- M12 coupling sockets
- Connection: M12 connector, 4-pin
- Shielded

PSENOpt op connector – Plug-in adapter for cascading light grids

- M12 coupling sockets
- Connection: M12 connector, 5-pin
- Use in stand-alone mode

Accessories PSENopt and PSENopt SB

Suitable for	Connector type	Order number
<ul style="list-style-type: none"> ▶ PSEN op2B ▶ PSEN op4F ▶ PSEN op4H ▶ PSEN op4B 	Angled plug	3 m 630 306
		5 m 630 307
		10 m 630 308
		30 m 630 319
	Straight plug	3 m 630 303
		5 m 630 304
		10 m 630 305
		30 m 630 309
<ul style="list-style-type: none"> ▶ PSEN op2B ▶ PSEN op4F ▶ PSEN op4H ▶ PSEN op4B 	Angled plug	3 m 630 316
		5 m 630 317
		10 m 630 318
		30 m 630 329
	Straight plug	3 m 630 313
		5 m 630 314
		10 m 630 315
		30 m 630 328
<ul style="list-style-type: none"> ▶ PSEN op2H ▶ PSEN op2/4S ▶ Muting sensors 	Angled plug	3 m 630 341
		5 m 630 342
		10 m 630 343
		30 m 630 344
	Straight plug	3 m 630 300
		5 m 630 301
		10 m 630 302
		30 m 630 296
<ul style="list-style-type: none"> ▶ PSEN op2H 	Angled plug	3 m 630 347
		5 m 630 348
		10 m 630 349
		30 m 630 350
	Straight plug	3 m 630 310
		5 m 630 311
		10 m 630 312
		30 m 630 297
<ul style="list-style-type: none"> ▶ PSEN op4F ▶ PSEN op4H 	Straight plug	0.5 m 630 280
		1 m 630 281
<ul style="list-style-type: none"> ▶ PSEN op4B 	Straight/angled plug	0.75 m 630 282
<ul style="list-style-type: none"> ▶ PSEN op4B 	Angled plug	630 295
<ul style="list-style-type: none"> ▶ PSEN op4F ▶ PSEN op4H 	Straight plug	630 285

Technical documentation on accessories for optoelectronic protective devices PSENopt and PSENopt SB:

 Webcode 0337

Online information at www.pilz.com



► Accessories – Optoelectronic protective de

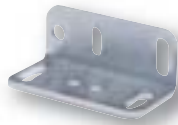
PSENopt optoelectronic protective devices – Muting



PSEN op1.1



PSEN iop1



Bracket



PIT si 1.1

Type

PSEN op1.1/PSEN op1.2 – Muting sensors

- Output: PNP, n/o and n/c
- Supply voltage: 10 ... 30 VDC
- Connection: M12 connector, 4-pin

PSEN op1.3 – PSEN op Reflector

- With prism reflector
- Output: PNP, n/o and n/c
- Supply voltage: 10 ... 30 VDC
- Connection: M12 connector, 4-pin

PSEN op1.4/PSEN op1.5 – Muting sensors

- Muting sensors for L-Configuration

PSEN op1.6/PSEN op1.7 – Muting sensors

- Muting sensors for T-Configuration

PSEN iop1

- Junction box to connect light grids

Bracket

Mounting bracket for muting sensors

PIT si 1.1 – Muting lamp, unmonitored

- Muting lamp not monitored in accordance with EN/IEC 61496
- Protection type IP65

PIT si 1.2 – Muting lamp, monitored

- Monitored muting lamp in accordance with EN/IEC 61496 and VDE 0113-201
- For use in applications up to Category 4 of EN 954-1
- 2 semiconductor outputs to monitor the function of the filament
- TÜV approval
- Protection type IP65

PIT si 2.1 – Muting lamp with LEDs

- Monitored muting lamp in accordance with EN/IEC 61496 and VDE 0113-201
- Protection type IP65
- Yellow LED
- Non-wearing

Accessories PSENopt and PSENopt SB

Suitable for	Operating range	Order number
<ul style="list-style-type: none"> ▶ PSEN op4 ▶ PSEN op2B ▶ PMUT 	0 ... 20 m	<ul style="list-style-type: none"> ▶ Receiver: PSEN op1.1 630 321 ▶ Transmitter: PSEN op1.2 630 322
<ul style="list-style-type: none"> ▶ PSEN op2B ▶ PSEN op4F ▶ PSEN op4H ▶ PSEN op4B ▶ PSEN opSB ▶ PMUT 	0.1 ... 6 m	<ul style="list-style-type: none"> ▶ Reflex: PSEN op1.3 630 320 ▶ Reflector: PSEN op Reflector..... 630 323
<ul style="list-style-type: none"> ▶ PSEN op4B-S 	0.1 ... 3 m	<ul style="list-style-type: none"> ▶ PSEN op1.4 Reflex 630 707 ▶ PSEN op1.5 Reflector..... 630 708
<ul style="list-style-type: none"> ▶ PSEN op4B-S 	0.1 ... 3 m	<ul style="list-style-type: none"> ▶ PSEN op1.6 Reflex 630 709 ▶ PSEN op1.7 Reflector..... 630 710
<ul style="list-style-type: none"> ▶ PSEN op4B-T/-L/-S 	-	630 370
<ul style="list-style-type: none"> ▶ PSEN op1.1 ▶ PSEN op1.2 ▶ PSEN op1.3 	-	630 324
<ul style="list-style-type: none"> ▶ PSEN op2B ▶ PSEN op4F ▶ PSEN op4H ▶ PSEN op4B ▶ PMUT <p>In conjunction with PSS programmable safety and control systems and with dual-pole outputs PSS DIO Z/DI2O Z</p>	0.1 ... 3 m	<ul style="list-style-type: none"> ▶ Muting lamp (incl. incandescent lamp, mounting bracket and 2 screws) 620 010 ▶ Incandescent lamp 620 100
<ul style="list-style-type: none"> ▶ PSEN op2B ▶ PSEN op4F ▶ PSEN op4H ▶ PSEN op4B <p>In conjunction with PNOZmulti, PSS, SafetyBUS p</p>	0.1 ... 3 m	<ul style="list-style-type: none"> ▶ Muting lamp (incl. incandescent lamp, mounting bracket and 2 screws) 620 020 ▶ Incandescent lamp 620 100
<ul style="list-style-type: none"> ▶ PSENopt <p>In conjunction with PSS programmable safety and control systems and with dual-pole outputs PSS DIO Z/DI2O Z</p>	0.1 ... 3 m	<ul style="list-style-type: none"> ▶ Muting lamp (incl. LED, mounting bracket and 2 screws) 620 015

Technical documentation on accessories for optoelectronic protective devices PSENopt and PSENopt SB:

 Webcode 0337

Online information at www.pilz.com



► Accessories – Optoelectronic protective de

Optoelectronic protective devices PSENOpt – Alignment, installation and operation



Floor stand



Deviating mirror



Laser pointer



Bracket kit



Test piece

Type

Floor stand

Dimensions:
(W x D) 240 x 240 mm
- Profile 30 x 30 mm

Dimensions:
(W x D) 240 x 240 mm
- Profile 45 x 45 mm

Deviating mirror

Dimensions:
(W x D) 124 x 6 mm

Laser pointer Alignment guide

Bracket kit

Mounting bracket

- Standard mounting brackets are included with the PSENOpt
- Profile 30 x 30 mm

Test piece

Accessories PSENopt and PSENopt SB

Suitable for	Description	Number in pack (units)	Order number
PSENopt and deviating mirror	1,000 mm	1	630330
	1,200 mm	1	630331
PSENopt	1,500 mm	1	630332
	1,800 mm	1	630333
PSENopt	550 mm	1	630335
	700 mm	1	630336
	900 mm	1	630337
	1,000 mm	1	630338
	1,270 mm	1	630339
<ul style="list-style-type: none"> ▶ PSEN op2B ▶ PSEN op4F ▶ PSEN op4H ▶ PSEN op4B 	Laser protection class 2 in accordance with EN 60825-1	1	630340
PSENopt	Standard (not for PSEN op2H)	4	630325
	Adjustable	4	630326
	Vibration-resistant	4	630327
PSENopt for finger and hand protection	F14 mm Diameter	1	630345
	H 30 mm Diameter	1	630346

Technical documentation on accessories for optoelectronic protective devices PSENopt and PSENopt SB:

 Webcode 0337

Online information at www.pitz.com



▶ Safe camera systems SafetyEYE® and PSEnvip



Your benefits at a glance

- ▶ Three-dimensional control and monitoring
- ▶ Wide, flexible range of uses
- ▶ Ergonomic workstations for greater productivity
- ▶ Efficient work practices for high cost effectiveness
- ▶ Simple, fast installation and commissioning using fewer, user-friendly components
- ▶ Intuitive operator guidance
- ▶ Simple configuration of 3D warning and detection zones
- ▶ User-friendly diagnostics and evidence

Innovative optics for your safety

Safe camera systems are used to monitor two-dimensional (2D) and three-dimensional (3D) zones. In contrast to conventional sensors, they are able to record and analyse detailed information about the whole monitored zone. The safe camera systems SafetyEYE and PSEnvip provide a high level of safety plus user-friendly functionalities for many safety and standard control functions.

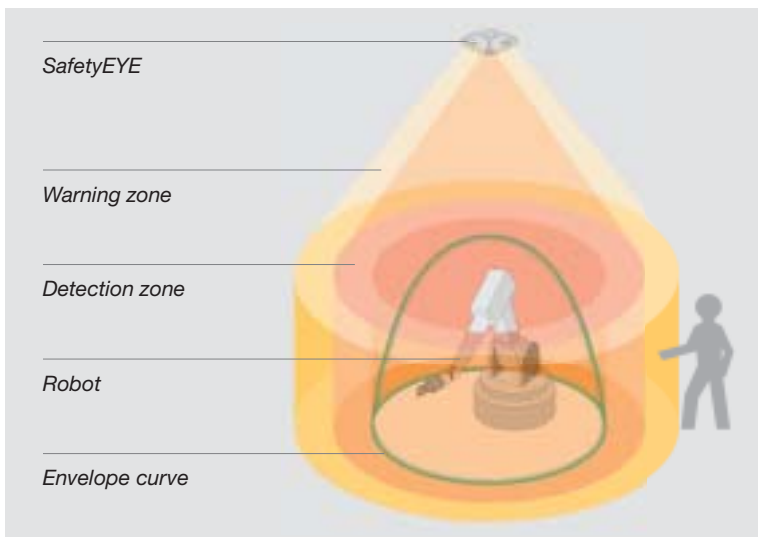
SafetyEYE safe camera system for three-dimensional zone monitoring

SafetyEYE is the first safe camera system for three-dimensional zone monitoring, which safely monitors and controls potentially hazardous work processes for safeguarding man and machine (safety) and also protects objects from unauthorised access (security). Unlike conventional safety devices it doesn't just monitor one level – but as many levels as you like, and in 3D too.

Several safety functions can be resolved in parallel, using just one SafetyEYE.

SafetyEYE, in other words, “sight-based” monitoring. It performs safety-related and standard control functions and thereby guarantees both ergonomic processes and efficient results. SafetyEYE is ever present: flexible, intelligent and simple to operate.

Further information and technical details are available in the SafetyEYE leaflet.



Ergonomic processes, efficient results, comprehensive safety – SafetyEYE operates from a bird's eye view.

Keep up-to-date on safe camera systems SafetyEYE:

Webcode 1902

Online information at www.pilz.com



Safe precision bending with PSEnvip

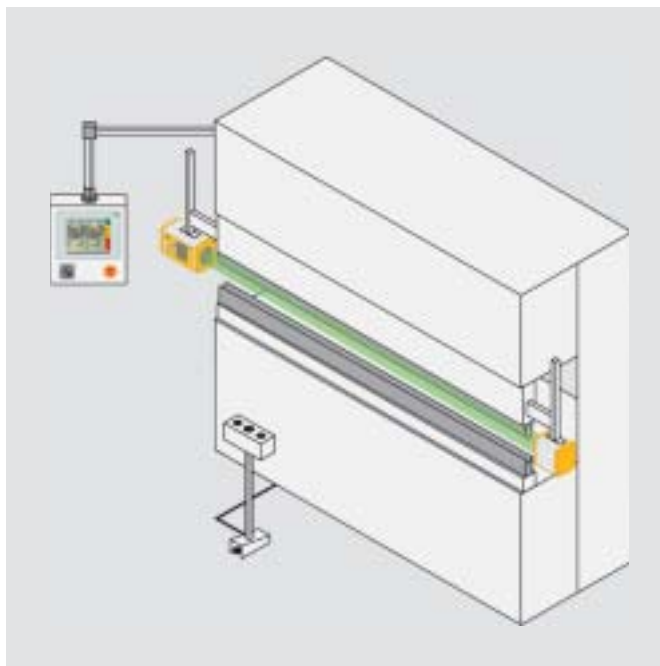
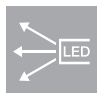
With the camera-based protection system PSEnvip Pilz has developed a product for visual monitoring of whole bending processes. An LED-based solution is used instead of a laser light source. When installed on the upper die of the press brake, the system detects

even the smallest foreign body in the protected field between the transmitter and receiver. In conjunction with descriptive diagnostic messages on the LCD display, it guarantees productive work practices in complete safety.

Further information is available in the PSEnvip leaflet.

Your benefits at a glance

- ▶ Unique optical technology with visible light beam, “parallel vision”
- ▶ Resistant to vibration, diffused light and temperature differences
- ▶ Fast, simple adjustment thanks to the innovative optical system
- ▶ User-friendly, software-based precision adjustment after tool change
- ▶ Simple operation and diagnostics via integrated display
- ▶ Safe monitoring using PSS programmable safety and control systems or PNOZmulti modular safety systems



Monitoring bending processes safely with the innovative protection system PSEnvip.

Keep up-to-date on safe camera systems PSEnvip:

Webcode 2080

Online information at www.pilz.com

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Please refer to our homepage for further details or contact our headquarters.

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