# Sensor technology PSEN®

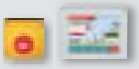
Safe proximity switches
Safe rope pull switches
Safety switches
Safety bolts
Safe hinge switches
Safety gate systems
Safety light beams/curtains/grids
Camera-based protection and measuring systems
Safe camera systems

**Your safe solution: Sensor technology plus control system.**

the spirit of safety

# Business activities

## Components

| | | |
|---|---|---|
| **Sensor technology** | ▸ Safe proximity switches<br>▸ Safe rope pull switches<br>▸ Safety switches<br>▸ Safety bolts<br>▸ Safe hinge switches<br>▸ Safety gate systems<br>▸ Safety light beams/curtains/grids<br>▸ Camera-based protection and measuring systems<br>▸ Safe camera systems |  |
| **Control technology** | ▸ Relays for electrical safety<br>▸ Relays for functional safety<br>▸ Configurable control systems<br>▸ Compact programmable control systems<br>▸ Modular programmable control systems<br>▸ Decentralised periphery |  |
| **Networks** | ▸ Network components<br>▸ Industrial communication | SafetyNET p® |
| **Drive technology** | ▸ Motion control systems<br>▸ Servo amplifiers<br>▸ Motors |  |
| **Operator and visualisation systems** | ▸ Control and signal devices<br>▸ Operator terminals |  |
| **Software** | ▸ System software and tools<br>▸ Application software |  |

## Systems

| | | |
|---|---|---|
| **Automation system PSS 4000** | ▸ Control systems<br>▸ Real-time Ethernet<br>▸ Software platform |  <br>SafetyNET p®<br>PAS 4000 |

## Services

| | | | |
|---|---|---|---|
| **Consulting and engineering** | ▸ Risk Assessment<br>▸ Safety Concept<br>▸ Safety Design<br>▸ System Implementation<br>▸ Safety Validation | ▸ CE Marking<br>▸ International Compliance Services<br>▸ Plant Assessment<br>▸ Inspection of ESPE |  |
| **Training** | ▸ Seminars<br>▸ 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.

**Americas**
- Brazil
  +55 11 8245-8267
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  +52 55 5572 1300
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  +86 21 62494658-216
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  +82 2 2263 9540

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  +61 3 95446300

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  +43 1 7986263-0
- Belgium, Luxembourg
  +32 9 3217575
- England
  +44 1536 462203
- France
  +33 3 88104000
- Germany
  +49 711 3409-444
- Ireland
  +353 21 4804983
- Italy
  +39 031 789511
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# Pilz – Complete automation

**Total customer proximity**

Pilz has a tradition as a family-run company stretching back over 60 years. Real proximity to customers is visible in all areas, instilling confidence through individual consultation, total flexibility and reliable service. Worldwide, round the clock, in 24 subsidiaries and branch offices.

**Benefit-oriented innovations**

Our customer proximity is the basis for our innovative strength. We are always oriented towards current market requirements, which is why we can offer innovative automation solutions in every case. Market leadership in safe automation secures our leadership in research and technology. Customer proximity and innovation belong together and are mutually dependent.

**Overall solutions**

Pilz is your solution supplier for all automation functions. Including standard control functions. Pilz developments protect man, machine and the environment. Our automation solutions incorporate our knowledge and experience from the stringent demands of safety technology, as well as the sum of our knowledge gained from over 60 years' experience of general automation technology.

All our experience and knowledge go into individual products and sophisticated system solutions.

- Sensor technology
- Control technology
- Networks
- Drive technology
- Operator and visualisation systems
- Software
- Automation system PSS 4000
- Consulting and engineering
- Training

**the spirit of safety**

With their knowledge, enthusiasm, creativity and courage to take the unconventional route, our staff have made us what we are today: one of the leading brands in automation technology.

More than 1 300 staff, each one of them an ambassador for safety, make sure that your company's most valuable asset – your staff – can work safely and free from injury.


# Safe sensor technology PSEN®

Plant and machinery have to be efficient and economical. They are becoming ever more complex due to the high level of automation, but they are still expected to be easy for users to operate.

Safety sensors are absolutely essential for the highest level of cost effectiveness and process safety. They provide effective personal security and industrial safety.

Such a challenge makes modern safety sensors indispensable. Used in conjunction with Pilz safe control technology, PSEN sensor technology provides cost efficient protection for man and machine, in compliance with the standards – for your success.

## Contents



# The safe, complete solution – Sensor and co

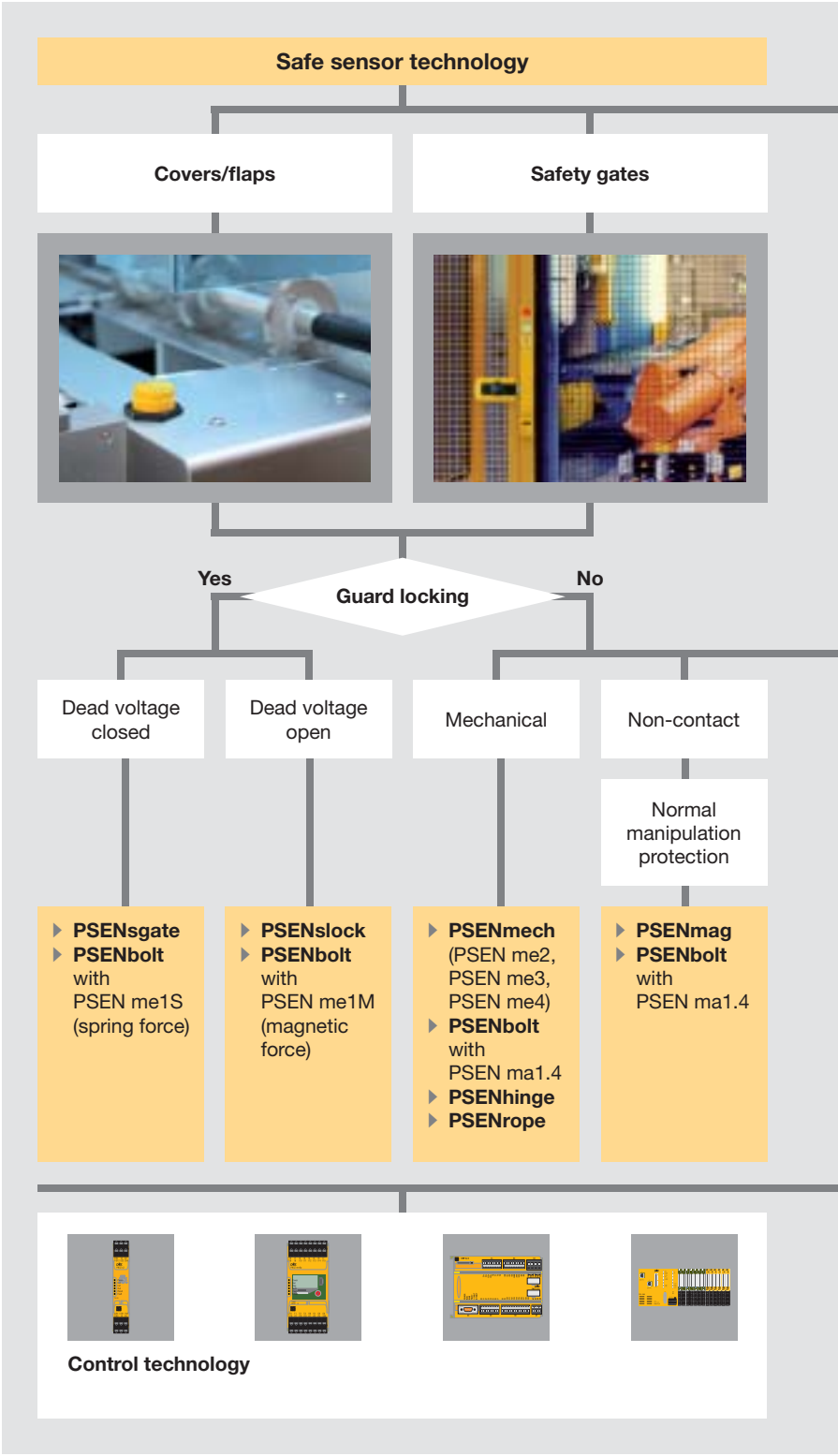
Pilz offers a universal concept for solutions that can be applied right across industry. Whether you need a single product or a total solution: with Pilz you will definitely find a solution for your automation function.

A ready-to-install system offers high potential savings in project configuration, design, documentation, purchasing and installation.

Enjoy the benefits of approved, co-ordinated, complete solutions, such as sensor plus control technology from Pilz. That's the only way to save time and money in the implementation of all components, including certified safety.

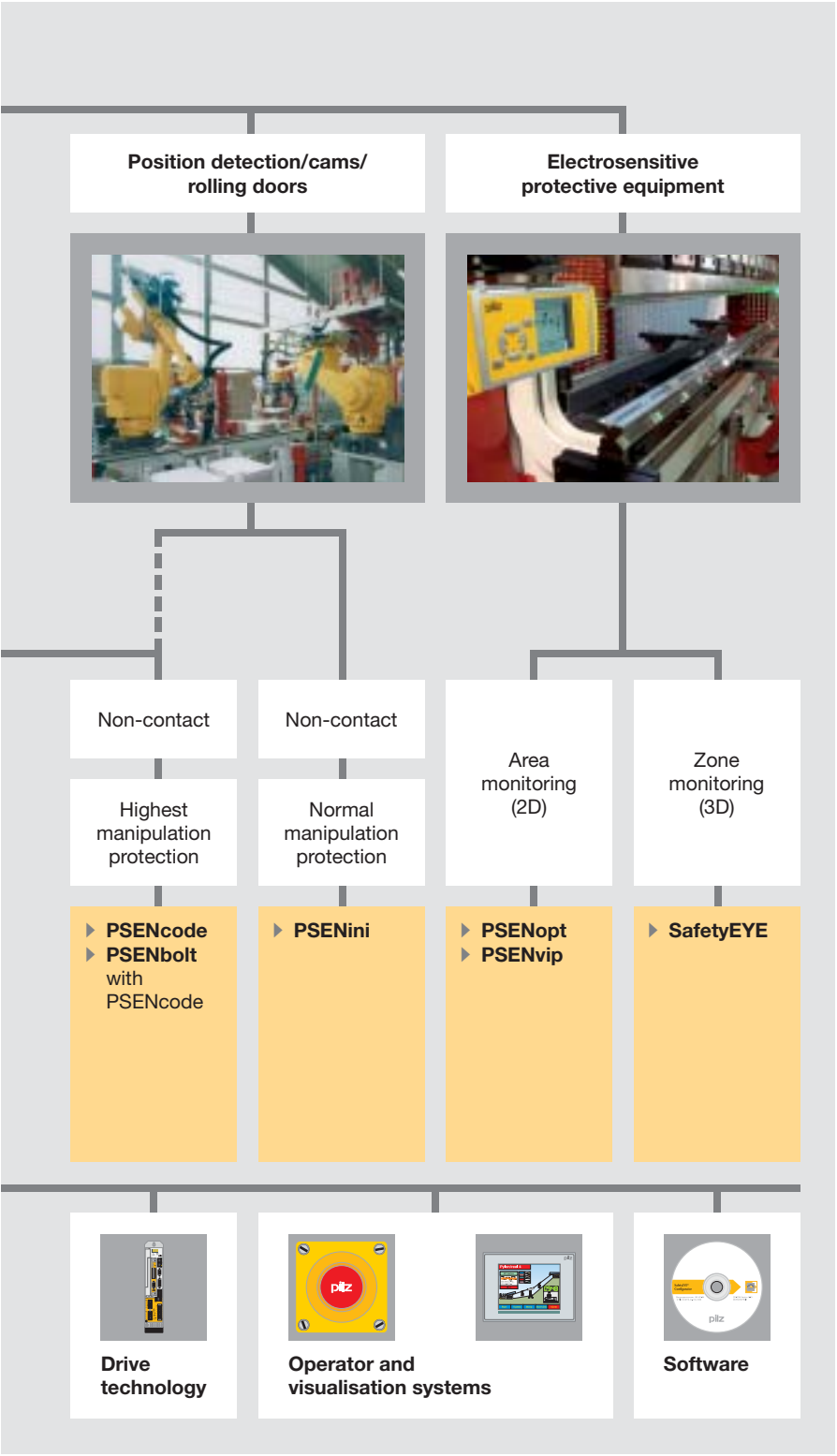
**The optimum solution for every requirement**

Our comprehensive product range covers the whole spectrum of safety requirements. Just assemble your own individual system solution, selecting the safety-related components that best suit your requirements.




*Selection guide – Sensor technology PSEN*

# ntrol technology from Pilz




**Solution suppliers for safety and standard**

Our sensor technology portfolio is supplemented by control technology, drive technology, operator and visualisation systems, plus software.

**Quality guarantee plus certified safety**

Pilz is certified to EN ISO 9001. Our products comply with international standards and have been tested and approved by international certification bodies.

**Services from the safety professionals**

Pilz is there beside you, acting as your competent partner during all phases of the machine's life: from the risk assessment and production of safety concepts through to implementation and validation. We can also offer CE-marking and other compliance services.

*Keep up-to-date on:*

- *Products*

Webcode 0326

- *Services*

Webcode 0427

*Dialogue with Pilz:*

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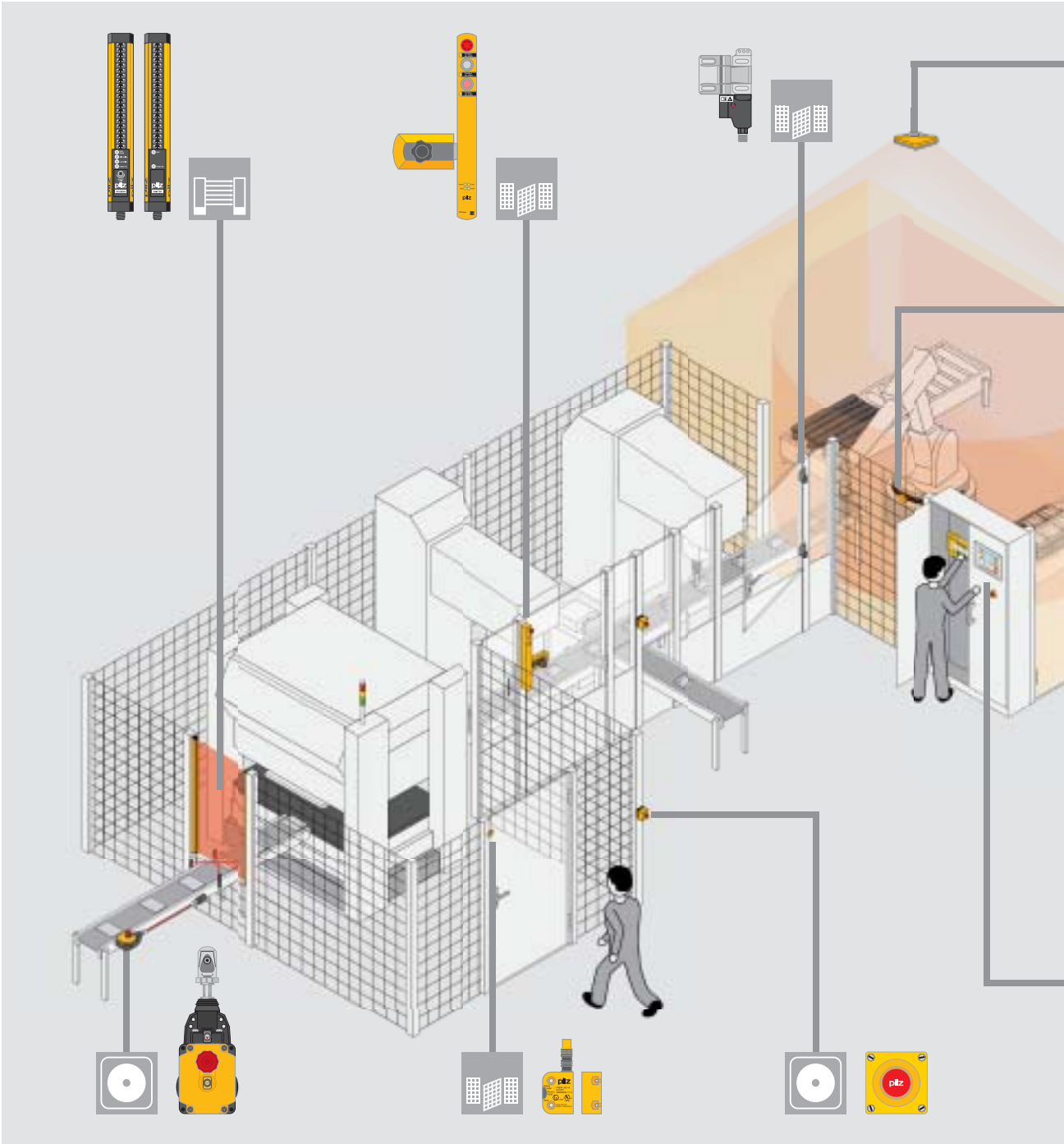
Webcode 0627

*Online information at www.pilz.com*

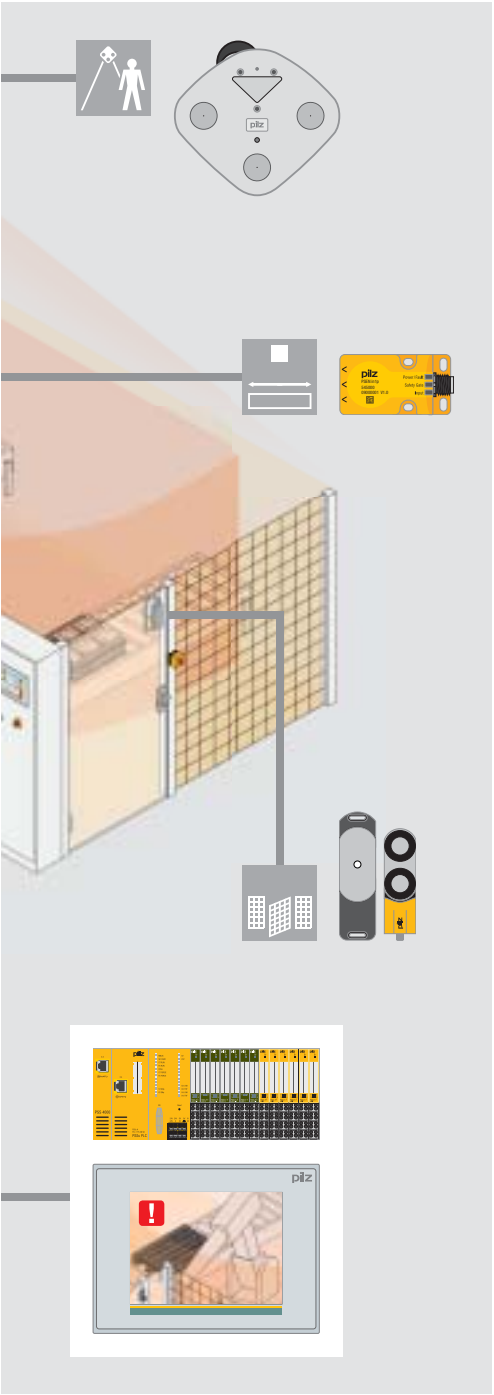


# The comprehensive product range for indivi



*The complete, one-stop solution that's safe and economical: Sensor and control technology from Pilz.*

# dual solutions – Sensor technology PSEN®







**The best solution for every requirement**

When the protection of man, machine and the environment is at stake in an industrial scenario, plants need to be efficient: from commissioning right through to high availability when operation is running. Here Pilz can offer a safe, complete, one-stop solution.

**Free choice – for your application**

Our components for both sensor and control technology are totally compatible and have been approved as a safe, overall system. For your tailor-made solution, just select the appropriate safe sensors:



**Protection for your investment**

Our products are also compatible with products and interfaces from other manufacturers. They fit perfectly into your plant environment and also enable Pilz components to be retrofitted to your plant or machine.

We place great value on performance, robustness, quality and ease of operation. With PSEN sensors, your investments are assured over many years because our systems are flexible to adapt to new requirements and are constantly undergoing development.

*Keep up-to-date on:*

- *Sensor technology PSEN*

Webcode 0219

- *Control technology*

Page 62

Webcode 0196

*Online information at www.pilz.com*



# Safe proximity switches PSENini


*PSEN in1p*

**… safe monitoring without actuators**

Safe proximity switches PSENini detect the approach of metallic objects without the use of contacts. They supply the necessary safe signals via positions and end limits. They can also generate the pulse for counting tasks or for speed detection.

Applications for PSENini:

- Cam
- Rolling doors
- Pulse generator for counting tasks or detecting rotational movements

**High productivity and long service life**

Compared with mechanical switches, PSENini provide the ideal prerequisites for high productivity and a long service life: non-contact, non-wearing operation, plus high switching frequencies and switching precision.

They are also insensitive to vibration, shock and humidity.

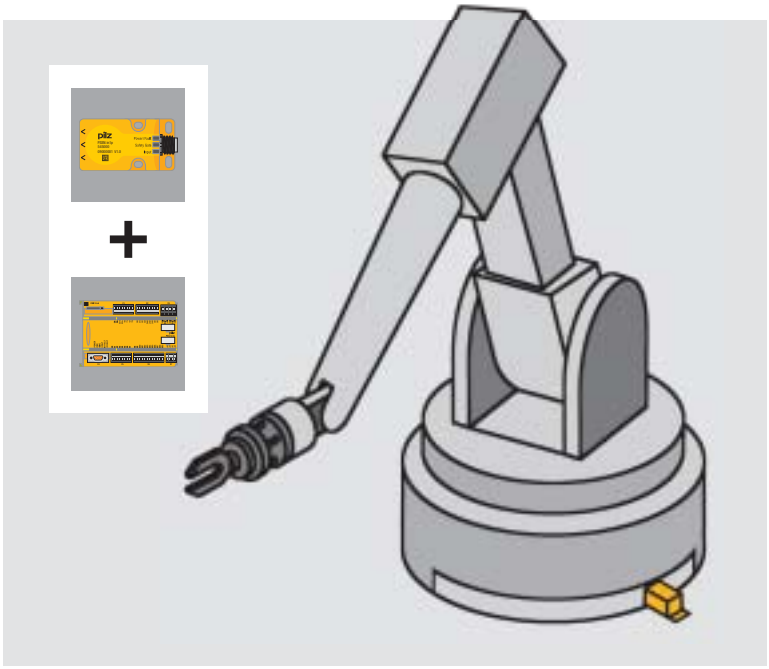
**High savings potential in series**

Take advantage of the high savings potential of PSENini, even with the very highest safety requirements, because PSENini can also be connected in series with safety switches PSENcode and safety gate systems PSENslock and PSENsgate.

**Type code for PSENini**

**PSEN in1p**

| Product area | Series | Connection type |
|---|---|---|
| **P**ilz **SEN**sors | | |
| **Product range** **in – PSENini** | **1** **Series 1** | **p** **Connector, M12, 8-pin** |
| **Operation** Non-contact, inductive | | n Connector, M12, 5-pin |



*The optimum solution: Position monitoring on the cam with proximity switch PSENini and control system PNOZmulti.*

**Your benefits at a glance**

- The safe, complete solution: we provide the appropriate evaluation device for PSENini
- Protection for your investment: PSENini are open to interfaces from other manufacturers and so can easily be retrofitted into your plant.
- Good diagnostics via LEDs
- Scalable and flexible: take advantage of the savings potential from series connection, even with the very highest safety requirements
- Simple project configuration, as the unit is highly versatile:
  - Insensitive to shock and vibration
  - With heavy soiling and strict hygiene regulations (IP67)

*Further information and technical documentation on safe proximity switches PSENini:*

Webcode 1953

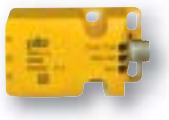
*Accessories, supplementary products and services:*

From page 62

Webcode 0326

*Online information at www.pilz.com*

## Selection guide – Safe proximity switches PSENini



*PSEN in1p*

| Type | Features |
|---|---|
| **PSEN in1p**<br><br>**Order number:**<br>545 000 | ▸ Highest level of safety up to PL e of EN ISO 13849-1, SIL CL 3 of EN/IEC 62061 and Cat. 4 of EN 954-1<br>▸ Highest level of safety, even in series with PSENini, PSENslock, PSENsgate and PSENcode<br>▸ Typical operating distance: 15 mm<br>▸ Directions of actuation: 1<br>▸ Approach directions: 5<br>▸ Diagnostic interface: 3 LEDs (status of actuator, status of inputs, supply voltage/error)<br>▸ Connection type:<br>- PSEN in1p: Connector, M12, 8-pin<br>- PSEN in1n: Connector, M12, 5-pin<br>▸ Outputs: 2 safety outputs and 1 signal output<br>▸ Inputs: 2 safety inputs |
| **PSEN in1n**<br><br>**Order number:**<br>545 003 | |



# Safe rope pull switches PSENrope

*PSEN rs1.0*

*PSEN rs2.0*

**… greater safety on the production line**

Whether on the assembly line or machine – where safety in the production area is concerned, safe rope pull switches PSENrope are a proven, reliable solution.

PSENrope switch off functional processes through manual operation. PSENrope provide maximum safety when it matters: the emergency stop function can be triggered at any point along the rope.

**Optimum safety solution is as simple as that**

PSENrope are flexible to use, easy to install and simple to operate. Whether it's a first-time installation or upgrade: safe rope pull switches PSENrope simplify installation with their sophisticated technical details.

**Durable – even under extreme conditions**

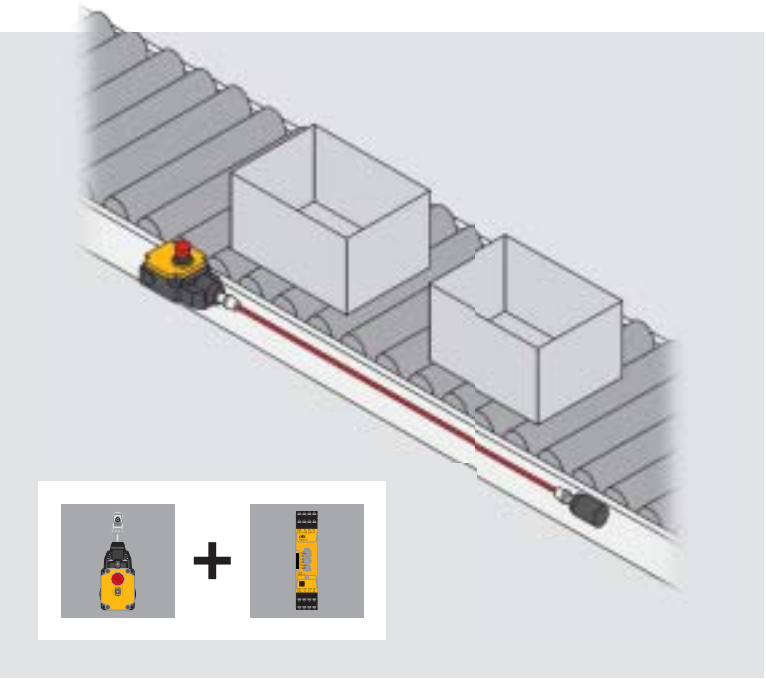
As the operating range of rope pull switches is limited only by the length of the rope, even large plants can be safeguarded using PSENrope.

PSENrope provide a reliable service, even under extreme environmental conditions. This is mainly due to the rugged finish.

**Type code for PSENrope**

**PSEN rs1.0-300**

| Product area<br>Pilz **SEN**sors | Housing material | Contacts | Max. spring force to tension the rope |
|---|---|---|---|
| **Product range**<br>**rs – PSENrope** | **1 Al die cast**<br>2 Plastic | **0 2 NC, 2 NO** | 175 175 N<br>**300 300 N** |
| **Operation**<br>Mechanical | | | |



*The optimum solution: Rapid emergency stop with rope pull switch PSENrope in conjunction with safety relay PNOZsigma.*

**Your benefits at a glance**

- High level of safety:
  - Safe from manipulation
  - Wiring space physically separate from mechanics
  - Dual function mushroom-type pushbutton: emergency stop and pull-to-release
- Whether it's a first-time installation or upgrade: PSENrope simplify installation
- Suitable for indoor and outdoor use thanks to rugged, hard-wearing metal or plastic housing

## Selection guide – Safe rope pull switches PSENrope

*PSEN rs1.0-175*

*PSEN rs2.0-300*

| Type | Housing material | Maximum rigging length | Order number |
|---|---|---|---|
| **PSEN rs1.0-175** | Al die cast | 37.5 m | 570301 |
| **PSEN rs1.0-300** | Al die cast | 75.0 m | 570300 |
| **PSEN rs2.0-175** | Plastic | 37.5 m | 570303 |
| **PSEN rs2.0-300** | Plastic | 75.0 m | 570302 |

**Common features**

- Suitable for applications up to:
  - PL e of EN ISO 13849-1
  - SIL CL 3 of EN/IEC 62061
  - Category 4 of EN 954-1
  (with additional measures)
- Integrated emergency stop pushbutton
- Contacts: 2 NC, 2 NO
- Protection type: IP67
- Ambient temperature:
  - PSEN rs1.0: -30 … +80 °C
  - PSEN rs2.0: -25 … +70 °C
- Dimensions (H x W x D):
  - PSEN rs1.0: 237 x 90.0 x 88 mm
  - PSEN rs2.0: 294 x 42.5 x 88 mm

*Technical documentation on safe rope pull switches PSENrope:*

Webcode 6000

*Accessories, supplementary products and services:*

From page 62

Webcode 0326

*Online information at www.pilz.com*



# Safety switches, safety bolts and safe hinge

*PSENmech* *PSENmag* *PSENcode* *PSENbolt* *PSENhinge*

**… for safety gate and position monitoring**

Pilz safety gate components are particularly economical in meeting the requirements of EN 1088. They are suitable for applications in mechanical engineering as well as in the packaging or pharmaceutical industry and many other sectors.

**Safety switches – for safety gate and position monitoring at optimum cost**

Safety switches are effective and optimised for cost. They are available with various designs and operating principles and can be used under difficult environmental conditions. Additional costs can be saved when connected in series.

Choose the optimum switch for your application:

- Mechanical – using increased extraction force on the actuator the PSENmech can prevent the safety gates from being opened unintentionally
- Non-contact, magnetic – the magnetic operation of the PSENmag is ideal for applications with the highest safety requirements
- Non-contact, coded – PSENcode offers the highest level of safety and manipulation protection with integrated evaluation in the smallest space possible

# switches

**Safety bolts – the robust, cost-effective solution for a rugged industrial environment**

PSENbolt safety bolts are the ideal solution for safety gates that are difficult to adjust or are used in areas where safety gates are often opened and closed. What you get is a complete, economical package comprising safety switch, handle and bolt, for a rugged industrial environment.

**Safe hinge switches – packaged hinge and safety switch**

For hinged safeguards, safe hinge switches PSENhinge are a safe complete solution, comprising hinge and safety switch. Designed as one functional and installation unit, they offer a high level of flexibility in installation, connection and adjustment.

**Selection guide – Safety switches, safety bolts and safe hinge switches**

| Type | Safety switches PSENmech | Safety switches PSENmag | Safety switches PSENcode | Safety bolts PSENbolt | Hinge switches PSENhinge |
|---|---|---|---|---|---|
| **Operation** | Mechanical | Non-contact, magnetic | Non-contact, coded | Mechanical | Mechanical |
| **Application on guards** | | | | | |
| **Covers** | ◆ | ◆ | ◆ | ◆ | |
| **Flaps** | ◆ | ◆ | ◆ | ◆ | ◆ |
| **Hinged safety gates** | ◆ | ◆ | ◆ | ◆ | ◆ |
| **Sliding safety gates** | ◆ | ◆ | ◆ | ◆ | |
| **Rolling doors** | | ◆ | ◆ | | |
| **Position detection** | | ◆ | ◆ | | |
| **Manipulation protection** | Normal | Normal | High | High [1)] | High |
| **Guard locking** | With/without | None | None | With [2)] | None |
| **IP protection type** | Up to IP65/IP67 | IP67/IP69K | IP67 | [3)] | IP67 |
| **Harsh environmental conditions** | Suitable | Very suitable | Very suitable | Very suitable | Very suitable |

*[1)] When using non-contact, coded safety switches PSENcode*
*[2)] When using mechanical safety switches PSEN me1 with guard locking*
*[3)] Depending on the safety switch that is used*

*Keep up-to-date on safety switches, safety bolts and safe hinge switches:*

Webcode 0307

*Online information at www.pilz.com*



# Mechanical safety switches 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.

**Guard locking until the risk is averted**

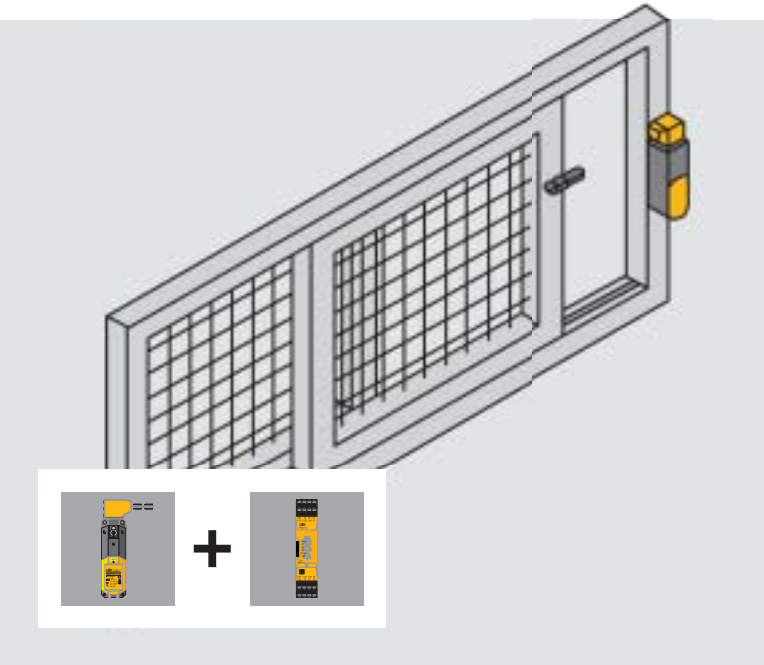
Using increased extraction force on the actuator, PSENmech safety switches prevent the safety gate from being opened unintentionally. They comply with the standard EN 1088 (protection against defeat) due to their coded actuators.

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.

## Type code for PSENmech

## PSEN me1.2S/1AR

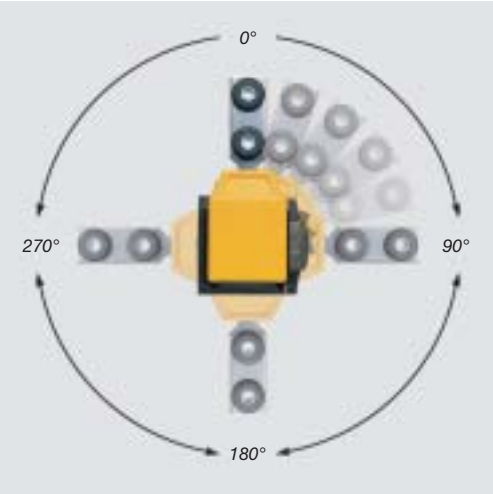
| Product area<br>Pilz **SEN**sors | Product series | Series 1:<br>Interlock principle/supply voltage | Series/actuator type |
|---|---|---|---|
| **Product range**<br>**me – PSENmech** | **1 With guard locking, dimensions: 170 x 42.5 x 51 mm** | S Spring force, 24 VAC/DC<br>**.2S Spring force, 110, 230 VAC**<br>M Magnetic force, 24 VAC/DC | 1AS Standard, Series 1<br>**1AR Radius, Series 1**<br>2AS Standard, Series 2 and 3<br>2AR Radius, Series 2 and 3<br>4AS Standard, Series 4 |
| **Operation**<br>Mechanical | 2 Without guard locking, dimensions: 75 x 52 x 33 mm<br>3 Without guard locking, dimensions: 90 x 52 x 33 mm<br>4 Without guard locking, dimensions: 100 x 31 x 30.5 mm | **Series 2: Contacts**<br>– 1 NC<br>**Series 3: Contacts**<br>_ 1 NC, 1 NO<br>.1 2 NC<br>.2 2 NC, 1 NO<br>**Series 4: Contacts/extraction force**<br>_ 1 NC, 1 NO<br>.01 1 NC, 1 NO, 50 N extraction force<br>.1 2 NC<br>.11 2 NC, 50 N extraction force<br>.2 2 NC, 1 NO<br>.21 2 NC, 1 NO, 50 N extraction force | |



*The optimum solution: Monitoring sliding gates using the PSENmech safety switch and PNOZsigma safety relay.*

**Your benefits at a glance**

- Safe, complete solution in conjunction with Pilz evaluation devices for applications with high safety requirements
- Flexibility and speed during installation 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




*Universal actuation directions provide flexibility during installation.*

*Keep up-to-date on mechanical safety switches PSENmech:*

Webcode 0314

*Online information at www.pilz.com*



# Selection guide – PSENmech

**Common features**

- Safety switches for monitoring the position of movable guards in accordance with EN 60947-5-3
- Suitable for applications up to:
  - PL e of EN ISO 13849-1
  - SIL CL 3 of EN/IEC 62061
  - Category 4 of EN 954-1
  (with additional measures)
- Can be connected to all Pilz evaluation devices
- Directions of actuation:
  - PSEN me1: eight
  - PSEN me2: four
  - PSEN 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: Spring-loaded terminals
  - PSEN me2, me3, me4:
    Screw terminals
- Protection type:
  - PSEN me1: IP67
  - PSEN me2, me3, me4: IP65
- Plastic-bodied design

## Mechanical safety switches PSENmech with separate actuator and

*PSEN me1S/1AS*

| Type | Interlock principle |
|---|---|
| **PSEN me1S/1AS** | Spring force |
| **PSEN me1.2S/1AS** | Spring force |
| **PSEN me1S/1AR** | Spring force |
| **PSEN me1.2S/1AR** | Spring force |
| **PSEN me1M/1AS** | Magnetic powered |
| **PSEN me1M/1AR** | Magnetic powered |

## Mechanical safety switches PSENmech with separate actuator, PSEN

*PSEN me2/2AS*

*PSEN me3/2AR*

*PSEN me4/4AS*

| Type | Actuator type |
|---|---|
| **PSEN me2/2AS** | Standard |
| **PSEN me2/2AR** | Radius |
| **PSEN me3/2AS** | Standard |
| **PSEN me3/2AR** | Radius |
| **PSEN me3.1/2AS** | Standard |
| **PSEN me3.1/2AR** | Radius |
| **PSEN me3.2/2AS** | 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 |

## guard 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 | 570000 |
| Standard |  | 110 … 230 VAC | ◆ | 1,500 N | min. 27 N | 570006 |
| Radius |  | 24 VAC/DC | ◆ | 1,500 N | min. 27 N | 570001 |
| Radius |  | 110 … 230 VAC | ◆ | 1,500 N | min. 27 N | 570007 |
| Standard |  | 24 VAC/DC | | 1,500 N | min. 27 N | 570004 |
| Radius |  | 24 VAC/DC | | 1,500 N | min. 27 N | 570005 |

## me2, 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 | 10 N | 570201 |
| |  | 240 V/3.0 A | 10 A | 10 N | 570210 |
| |  | 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 | 10 N | 570222 |
| |  | 240 V/1.5 A | 5 A | 10 N | 570230 |
| |  | 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 |

[1] *Order number for safety switch and actuator (one unit)*

★ *Recommended type for the majority of applications*

*Technical documentation on mechanical safety switches PSENmech:*

Webcode 0314

*Accessories, supplementary products and services:*

From page 62

Webcode 0326

*Online information at www.pilz.com*



# Non-contact magnetic safety switches PSEN

*PSEN ma1.4a*

*PSEN ma1.4p*

*PSEN 1.2p*


*PSEN ma1.3a*

**… highest level of safety at a low price**

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

PSENmag gives you a cost-optimised system comprising Pilz sensor and control system, including approval.

**Maximum freedom for installation**

The compact design of the PSENmag saves installation space. Connector and cable for all mounting and approach directions, plus an assured operating distance of 3 or 8/10 mm, enable flexible assembly and rapid, simple installation.

**High requirements – implemented economically**

PSENmag switches can be used where a high category is specified, where there is heavy soiling or where strict hygiene regulations need to be met.

The low wear and tear of the rugged, fully encapsulated housing, in conjunction with the non-contact, magnetic operating principle, guarantees a long product service life.

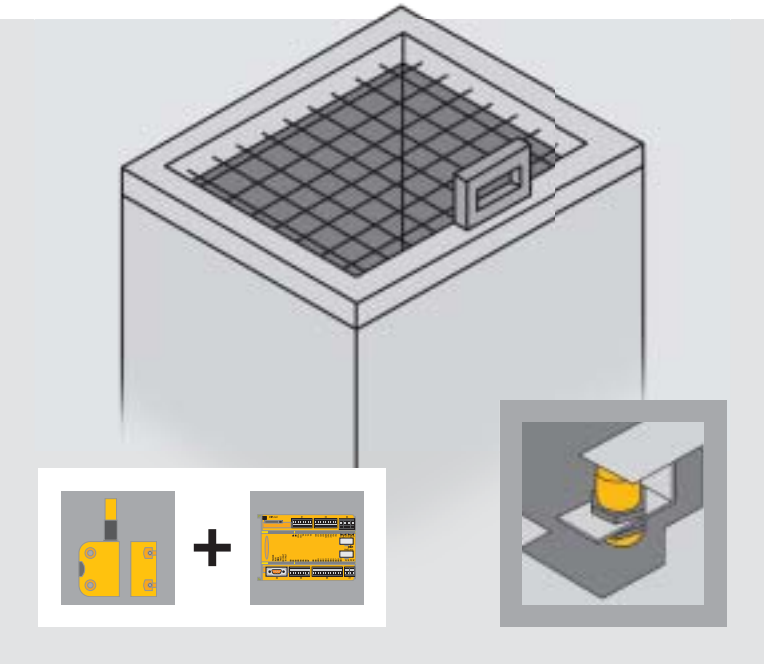
## Type code for PSENmag

**PSEN ma1.4a-50**

| Product area Pilz SENsors | Contacts | Design | Connection type | Operating distance | LED/ATEX/Series connection |
|---|---|---|---|---|---|
| **Product range ma – PSENmag** | **1 NO/NO**<br>2 NC/NO | 1 Square, dimensions: 36 x 26 x 13 mm<br>2 Round, M30<br>3 Round, M12 with signal contact<br>**4 Square, dimensions: 37 x 26.4 x 18 mm** | **a Cable, 5 m**<br>b Cable, 10 m<br>n Connector, M12, 5-pin<br>p Connector, M8:<br>- 4-pin<br>- 8-pin | 1 3 mm<br>2 8 mm/12 mm [1]<br>3 6 mm<br>4 4 mm<br>**5 3 mm/10 mm [1]** | **0 Without LED**<br>1 With LED<br>2 Only with PSEN ix1 [2]<br>3 ATEX, without LED<br>4 ATEX, with LED<br>5 ATEX, without LED, only with PSEN ix1 [2]<br>6 ATEX, without LED<br>7 Only with PSEN ix1 [2]<br>8 ATEX, with LED, only with PSEN ix1 [2]<br>9 Special types |
| **Operation** Non-contact, magnetic | | | | | |

*[1] Depends on the actuator [2] Ri = 0 Ω*

# mag



*The optimum solution: Monitoring a cover using PSENmag safety switches and the control system PNOZmulti.*

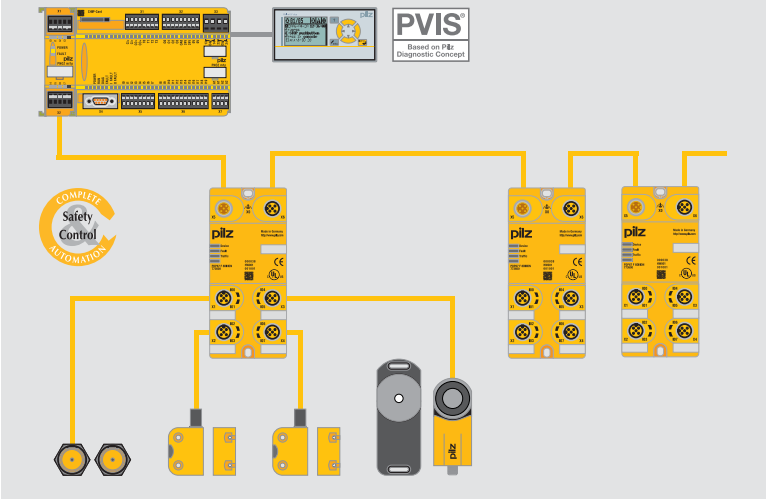
**Your benefits at a glance**

- Safe, complete solution with BG certification for the highest category applications
- Economical thanks to:
  - Space and time-saving installation
  - Series connection
  - Long product service life as it is mechanically non-wearing
  - User-friendly diagnostics via an additional signal contact and LED
- Insensitive to shock and vibration
- High level of safety, even in potentially explosive areas

## Highest level of safety in series

Save time and costs! The decentralised periphery device PDP67 can be used to connect PSENmag and other sensors to the configurable control system PNOZmulti. Short, standard plug-in sensor cables provide fast, economical installation.

The IP67 housing also saves you space in the control cabinet. The high diagnostic capability of the PDP67 in conjunction with the configurable control system PNOZmulti provides efficient operation in an emergency.




*Keep up-to-date on non-contact, magnetic safety switches PSENmag:*

Webcode 0357

*Online information at www.pilz.com*



# Selection guide – PSENmag

## Non-contact magnetic safety switches PSENmag – Square design

### Common features

- Safety switches for monitoring the position of movable guards in accordance with EN 60947-5-3
- Approved for applications up to Performance Level e of EN ISO 13849-1 and SIL CL 3 of IEC 62061 or up to Category 4 of EN 954-1 in conjunction with:
  - Safety relays PNOZsigma: PNOZ s3, PNOZ s4, PNOZ s5
  - Configurable safety systems PNOZmulti: All evaluation devices
  - Programmable control systems PSS, with or without SafetyBUS p interface: All evaluation devices
- Connected directly, via PDP67 or via the interface PSEN ix1, see accessories, page 66
- Protection type:
  - Cable versions: IP69K
  - Connector versions: IP67

*PSEN ma1.4a*

*PSEN ma1.4p*

*PSEN 1.1p*

| Type | Assured switching distance |
|---|---|
| ★ **PSEN ma1.4a-50/PSEN ma1.4-10** | 10 mm |
| **PSEN ma1.4a-51/PSEN ma1.4-10** | 10 mm |
| **PSEN ma1.4a-52/PSEN ma1.4-10** | 10 mm |
| **PSEN ma1.4p-50/PSEN ma1.4-10** | 10 mm |
| ★ **PSEN ma1.4p-51/PSEN ma1.4-10** | 10 mm |
| **PSEN ma1.4p-52/PSEN ma1.4-10** | 10 mm |
| **PSEN ma1.4n-50/PSEN ma1.4-10** | 10 mm |
| **PSEN ma1.4n-51/PSEN ma1.4-10** | 10 mm |
| **PSEN 1.1a-20/PSEN 1.1-20** | 8 mm |
| **PSEN 1.1a-22/PSEN 1.1-20** | 8 mm |
| **PSEN 2.1a-20/PSEN 2.1-20** | 8 mm |
| **PSEN 2.1b-20/PSEN 2.1-20** | 8 mm |
| **PSEN 1.1p-20/PSEN 1.1-20** | 8 mm |
| **PSEN 1.1p-22/PSEN 1.1-20** | 8 mm |
| **PSEN 2.1p-20/PSEN 2.1-20** | 8 mm |
| **PSEN 2.1p-21/PSEN 2.1-20** | 8 mm |
| **PSEN 1.1b-23/PSEN 1.1-20** | 8 mm |
| **PSEN 1.1p-23/PSEN 1.1-20** | 8 mm |
| **PSEN 1.1p-25/PSEN 1.1-20** | 8 mm |
| ★ **PSEN ma1.4a-50/PSEN ma1.4-03** | 3 mm |
| **PSEN ma1.4a-51/PSEN ma1.4-03** | 3 mm |
| **PSEN ma1.4a-52/PSEN ma1.4-03** | 3 mm |
| **PSEN ma1.4p-50/PSEN ma1.4-03** | 3 mm |
| **PSEN ma1.4p-51/PSEN ma1.4-03** | 3 mm |
| **PSEN ma1.4p-52/PSEN ma1.4-03** | 3 mm |
| **PSEN ma1.4n-50/PSEN ma1.4-03** | 3 mm |
| **PSEN ma1.4n-51/PSEN ma1.4-03** | 3 mm |
| **PSEN 1.1p-10/PSEN 1.1-10** | 3 mm |
| **PSEN 1.1p-12/PSEN 1.1-10** | 3 mm |

| Contacts | Single connection | Series via | LED | ATEX | Connection type Cable/connector | Order number[1] |
|---|---|---|---|---|---|---|
| 2 | ◆ | - | | | 5 m | 506322 |
| 3 | ◆ | - | ◆ | | 5 m | 506326 |
| 2 | | PSEN ix1 | | | 5 m | 506323 |
| 2 | ◆ | - | | | M8, 4-pin, pigtail, 25 cm | 506334 |
| 3 | ◆ | - | ◆ | | M8, 8-pin, pigtail, 25 cm | 506338 |
| 2 | | PSEN ix1 | | | M8, 4-pin, pigtail, 25 cm | 506335 |
| 2 | ◆ | PDP67 | | | M12, 5-pin, pigtail, 25 cm | 506342 |
| 3 | ◆ | PDP67 | ◆ | | M12, 5-pin, pigtail, 25 cm | 506343 |
| 2 | ◆ | - | | | 5 m | 504226 |
| 2 | | PSEN ix1 | | | 5 m | 504228 |
| 2 | ◆ | - | | | 5 m | 502226 |
| 2 | ◆ | - | | | 10 m | 502227 |
| 2 | ◆ | - | | | M8, 4-pin | 504220 |
| 2 | | PSEN ix1 | | | M8, 4-pin | 504222 |
| 2 | ◆ | - | | | M8, 4-pin | 502220 |
| 2 | ◆ | - | ◆ | | M8, 4-pin | 502221 |
| 2 | ◆ | - | | ◆ | 10 m | 504250 |
| 2 | ◆ | - | | ◆ | M8, 4-pin | 504223 |
| 2 | | PSEN ix1 | | ◆ | M8, 4-pin | 504225 |
| 2 | ◆ | - | | | 5 m | 506320 |
| 3 | ◆ | - | ◆ | | 5 m | 506324 |
| 2 | | PSEN ix1 | | | 5 m | 506321 |
| 2 | ◆ | - | | | M8, 4-pin, pigtail, 25 cm | 506332 |
| 3 | ◆ | - | ◆ | | M8, 8-pin, pigtail, 25 cm | 506336 |
| 2 | | PSEN ix1 | | | M8, 4-pin, pigtail, 25 cm | 506333 |
| 2 | ◆ | PDP67 | | | M12, 5-pin, pigtail, 25 cm | 506340 |
| 3 | ◆ | PDP67 | | | M12, 5-pin, pigtail, 25 cm | 506341 |
| 2 | ◆ | - | | | M8, 4-pin | 504210 |
| 2 | | PSEN ix1 | | | M8, 4-pin | 504212 |

[1] *Order number for safety switch and actuator (one unit)*

★ *Recommended type for the majority of applications*

*Technical documentation on non-contact, magnetic safety switches PSENmag:*

Webcode 0357

*Accessories, supplementary products and services:*

From page 62

Webcode 0326

*Online information at www.pilz.com*



# Selection guide – PSENmag

## Non-contact magnetic safety switches PSENmag – Round design

### Common features

- Safety switches for monitoring the position of movable guards in accordance with EN 60947-5-3
- Approved for safe applications up to Performance Level e of EN ISO 13849-1 and SIL CL 3 of IEC 62061 or up to Category 4 of EN 954-1 in conjunction with:
  - Configurable safety systems PNOZmulti: All evaluation devices
  - Programmable control systems PSS/SafetyBUS p: All, in conjunction with standard function block SB066 for safety gate monitoring
- Connected directly, via PDP67 or via the interface PSEN ix1, see accessories, page 66
- Protection type:
  - Cable versions: IP69K
  - Connector versions: IP67

*PSEN ma1.3*

*PSEN 1.2p*

| Type | Operating distance |
|---|---|
| **M12 housing** | |
| ★ **PSEN ma1.3a-20/PSEN ma1.3-08** | 8 mm |
| **PSEN ma1.3a-22/PSEN ma1.3-08** | 8 mm |
| **PSEN ma1.3b-20/PSEN ma1.3-08** | 8 mm |
| **PSEN ma1.3b-22/PSEN ma1.3-08** | 8 mm |
| **PSEN ma1.3p-20/PSEN ma1.3-08** | 8 mm |
| **PSEN ma1.3n-20/PSEN ma1.3-08** | 8 mm |
| **PSEN ma1.3p-22/PSEN ma1.3-08** | 8 mm |
| ★ **PSEN ma1.3a-20/PSEN ma1.3-12** | 12 mm |
| **PSEN ma1.3a-22/PSEN ma1.3-12** | 12 mm |
| **PSEN ma1.3b-20/PSEN ma1.3-12** | 12 mm |
| **PSEN ma1.3b-22/PSEN ma1.3-12** | 12 mm |
| **PSEN ma1.3p-20/PSEN ma1.3-12** | 12 mm |
| **PSEN ma1.3n-20/PSEN ma1.3-12** | 12 mm |
| **PSEN ma1.3p-22/PSEN ma1.3-12** | 12 mm |
| **PSEN ma1.3b-23/PSEN ma1.3-08** | 8 mm |
| **PSEN ma1.3b-25/PSEN ma1.3-08** | 8 mm |
| **PSEN ma1.3b-23/PSEN ma1.3-12** | 12 mm |
| **PSEN ma1.3b-25/PSEN ma1.3-12** | 12 mm |
| **M30 housing** | |
| **PSEN 1.2p-20** | 8 mm |
| **PSEN 1.2p-22** | 8 mm |
| **PSEN 2.2p-20** | 8 mm |
| **PSEN 2.2p-21** | 8 mm |
| **PSEN 1.2p-23** | 8 mm |
| **PSEN 1.2p-25** | 8 mm |
| **PSEN 2.2p-24** | 8 mm |

| Contacts | Single connection | Series via | LED | ATEX | Connection type Cable/connector | Order number[1] |
|---|---|---|---|---|---|---|
| 3 NC | ◆ | - | ◆ | | 5 m | 506220 |
| 3 NC | | PSEN ix1 | ◆ | | 5 m | 506221 |
| 3 NC | ◆ | - | ◆ | | 10 m | 506222 |
| 3 NC | | PSEN ix1 | ◆ | | 10 m | 506223 |
| 3 NC | ◆ | - | ◆ | | M8, 8-pin, pigtail, 25 cm | 506226 |
| 3 NC | ◆ | PDP67 | ◆ | | M12, 5-pin, pigtail, 25 cm | 506228 |
| 3 NC | | PSEN ix1 | ◆ | | M8, 8-pin, pigtail, 25 cm | 506227 |
| 3 NC | ◆ | - | ◆ | | 5 m | 506230 |
| 3 NC | | PSEN ix1 | ◆ | | 5 m | 506231 |
| 3 NC | ◆ | - | ◆ | | 10 m | 506232 |
| 3 NC | | PSEN ix1 | ◆ | | 10 m | 506233 |
| 3 NC | ◆ | - | ◆ | | M8, 8-pin, pigtail, 25 cm | 506236 |
| 3 NC | ◆ | PDP67 | ◆ | | M12, 5-pin, pigtail, 25 cm | 506238 |
| 3 NC | | PSEN ix1 | ◆ | | M8, 8-pin, pigtail, 25 cm | 506237 |
| 3 NC | ◆ | - | ◆ | ◆ | 10 m | 506224 |
| 3 NC | | PSEN ix1 | ◆ | ◆ | 10 m | 506225 |
| 3 NC | ◆ | - | ◆ | ◆ | 10 m | 506234 |
| 3 NC | | PSEN ix1 | ◆ | ◆ | 10 m | 506235 |
| 2 NC | ◆ | - | | | M8, 4-pin | 505220 |
| 2 NC | | PSEN ix1 | | | M8, 4-pin | 505222 |
| 1 NC 1 NO | ◆ | - | | | M8, 4-pin | 503220 |
| 1 NC 1 NO | ◆ | - | ◆ | | M8, 4-pin | 503221 |
| 2 NC | ◆ | - | | ◆ | M8, 4-pin | 505223 |
| 2 NC | | PSEN ix1 | | ◆ | M8, 4-pin | 505225 |
| 1 NC 1 NO | ◆ | - | ◆ | ◆ | M8, 4-pin | 503224 |

*[1] Order number for safety switch and actuator (one unit)*

★ *Recommended type for the majority of applications*

*Technical documentation on non-contact, magnetic safety switches PSENmag:*

Webcode 0357

*Accessories, supplementary products and services:*

From page 62

Webcode 0326

*Online information at www.pilz.com*



# Non-contact, coded safety switches PSEN

*PSEN cs3.1a*

*PSEN cs4.1p*

*PSEN cs1.1p*

**… Highest level of manipulation protection in the smallest space**

PSENcode are used to monitor the position of guards in accordance with EN 60947-5-3 and also for general position monitoring.

With PSENcode you have the smallest, coded safety switch with integrated evaluation and built-in manipulation protection.

PSENcode achieves the highest level of manipulation protection by transmitting a unique code from the actuator to the switch (key lock principle).

**Simple implementation saves time and money**

Save costs, from project configuration through to commissioning: Used in conjunction with Pilz control technology, PSENcode provide a complete, co-ordinated solution that's economical and safe.

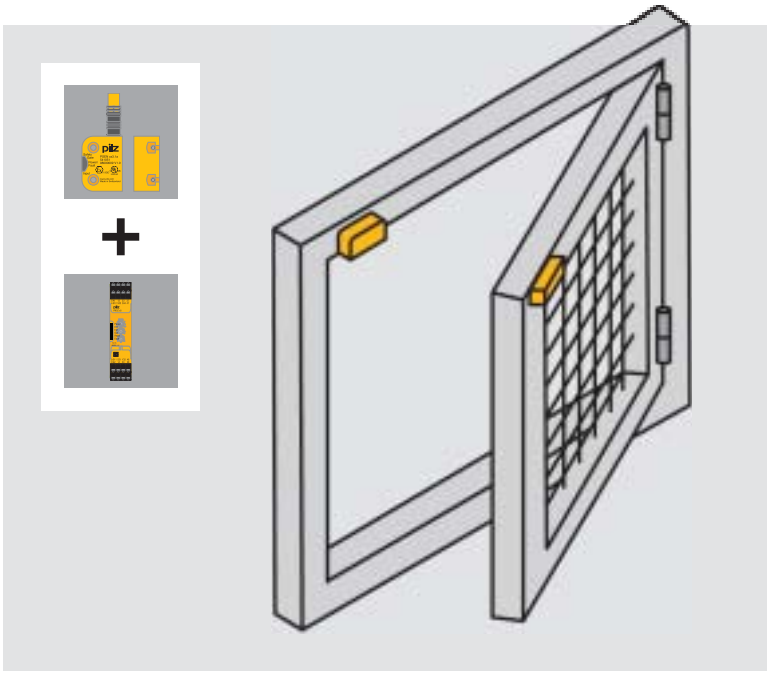
Thanks to integrated evaluation and standard interfaces, PSENcode are open to products from other manufacturers. They fit perfectly into your environment and can be used to upgrade your plant.

## Type code for PSENcode

**PSEN cs2.13p**

| Product area Pilz SENsors | Coding/design | ATEX | Connection/design |
|---|---|---|---|
| **Product range cs – PSENcode** | 1.1 Coded, large design | _ Without ATEX | a ▸ Large design: Not available<br>▸ Compact design: Cable, 5 m |
| **Operation**<br>▸ Non-contact, coded<br>▸ Transponder (RFID)<br>▸ With safe semiconductor outputs | **2.1 Fully coded, large design**<br>2.2 Unique, fully coded, large design<br>3.1 Coded, compact design<br>4.1 Fully coded, compact design<br>4.2 Unique, fully coded, compact design | **3 With ATEX** | b ▸ Large design: Not available<br>▸ Compact design: Cable, 10 m<br>n ▸ Large design: Connector, M12, 5-pin<br>▸ Compact design: Connector, M12, 5-pin<br>**p ▸ Large design: Connector, M12, 8-pin**<br>**▸ Compact design: Connector, M8, 8-pin** |

# code



*The optimum solution: Monitoring swing gates using the PSENcode safety switch and PNOZsigma safety relay.*

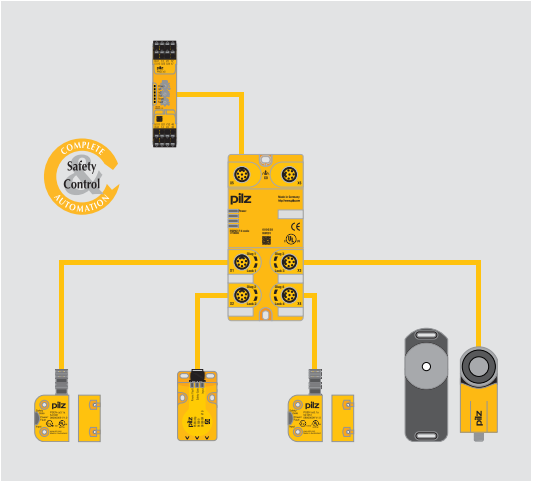
**Your benefits at a glance**

- Highest level of safety and plant availability
- Highest level of manipulation protection in the smallest space
- System comprises sensor and control system and is optimised for monitoring safeguards
- Simple project configuration, as the unit is highly versatile:
  - Insensitive to shock and vibration
  - Can be used with heavy soiling and strict hygiene regulations (IP67)
  - Flexible installation
- Economical:
  - Space-saving installation due to the compact housing
  - Highest level of safety, even in series with PSENcode, PSENini, PSENslock and PSENsgate

## Highest level of safety in series

Save time and costs! The PSENcode can be connected to PNOZsigma safety relays and all other control systems via the passive junction PDP67. This complete solution can be used for applications up to PL e of EN ISO 13849-1 and up to SIL CL 3 of EN/IEC 62061.

Short, standard plug-in sensor cables provide fast, economical installation. The IP67 housing also saves you space in the control cabinet.




*Keep up-to-date on non-contact, coded safety switches PSENcode:*

Webcode 0365

*Online information at www.pilz.com*



# Selection guide – PSENcode

## Selection guide – Non-contact coded safety switches PSENcode

### Common features

- Safety switches for monitoring the position of movable guards
- Approved for applications up to PL e of EN ISO 13849-1, SIL CL 3 of EN/IEC 62061 and Cat. 4 of EN 954-1
- Integrated evaluation and standard interfaces for connection to evaluation devices from Pilz or other manufacturers
- Series connection with PSENcode, PSENini, PSENslock, PSENsgate via PDP67 approved up to PL e of EN ISO 13849-1, up to SIL CL 3 of EN/IEC 62061 or up to Cat. 4 of EN 954-1
- Protection type IP67/IP69K
- Diagnostic interface with 3 LEDs
- Typical operating distance:
  - PSEN cs1/PSEN cs2: 21 mm
  - PSEN cs3/PSEN cs4: 10 mm
- Outputs: 2 safety outputs and 1 signal output
- Inputs: 2 safety inputs

*PSEN cs3.1a*

*PSEN cs4.1p*

*PSEN cs1.1p*

| Type | Type of coding |
|---|---|
| **PSEN cs3.1a/PSEN cs3.1** | Coded [2] |
| **PSEN cs3.1b/PSEN cs3.1** | Coded [2] |
| **PSEN cs3.1p/PSEN cs3.1** | Coded [2] |
| **PSEN cs3.1n/PSEN cs3.1** | Coded [2] |
| **PSEN cs3.1 M12/8-1.5m** | Coded [2] |
| **PSEN cs4.1a/PSEN cs4.1** | Fully coded [3] |
| **PSEN cs4.1b/PSEN cs4.1** | Fully coded [3] |
| **PSEN cs4.1p/PSEN cs4.1** | Fully coded [3] |
| **PSEN cs4.1n/PSEN cs4.1** | Fully coded [3] |
| **PSEN cs4.2a/PSEN cs4.1** | Unique, fully coded [4] |
| **PSEN cs4.2b/PSEN cs4.1** | Unique, fully coded [4] |
| **PSEN cs4.2p/PSEN cs4.1** | Unique, fully coded [4] |
| **PSEN cs4.2n/PSEN cs4.1** | Unique, fully coded [4] |
| **PSEN cs1.1p/PSEN cs1.1** | Coded [2] |
| **PSEN cs2.1p/PSEN cs2.1** | Fully coded [3] |
| **PSEN cs2.2p/PSEN cs2.1** | Unique, fully coded [4] |
| **PSEN cs1.13p/PSEN cs1.1** | Coded [2] |
| **PSEN cs2.13p/PSEN cs2.1** | Fully coded [3] |

| Size | ATEX | Connection type | Number of directions | | Order number [1] |
|---|---|---|---|---|---|
| | | | actuation | approach | |
| Compact | | Cable, 5 m | 1 | 4 | 541 001 |
| Compact | | Cable, 10 m | 1 | 4 | 541 002 |
| Compact | | Connector, M8, 8-pin, pigtail, 25 cm | 1 | 4 | 541 000 |
| Compact | | Connector, M12, 5-pin, pigtail, 25 cm | 1 | 4 | 541 003 |
| Compact | | Connector, M12, 8-pin, pigtail, 150 cm | 1 | 4 | 541 004 |
| Compact | | Cable, 5 m | 1 | 4 | 541 101 |
| Compact | | Cable, 10 m | 1 | 4 | 541 102 |
| Compact | | Connector, M8, 8-pin, pigtail, 25 cm | 1 | 4 | 541 100 |
| Compact | | Connector, M12, 5-pin, pigtail, 25 cm | 1 | 4 | 541 103 |
| Compact | | Cable, 5 m | 1 | 4 | 541 201 |
| Compact | | Cable, 10 m | 1 | 4 | 541 202 |
| Compact | | Connector, M8, 8-pin, pigtail, 25 cm | 1 | 4 | 541 200 |
| Compact | | Connector, M12, 5-pin, pigtail, 25 cm | 1 | 4 | 541 203 |
| Large | | Connector, M12, 8-pin | 5 | 4 | 540 000 |
| Large | | Connector, M12, 8-pin | 5 | 4 | 540 100 |
| Large | | Connector, M12, 8-pin | 5 | 4 | 540 200 |
| Large | ◆ | Connector, M12, 8-pin | 5 | 4 | 540 005 |
| Large | ◆ | Connector, M12, 8-pin | 5 | 4 | 540 105 |

*[1] Order number for safety switch and actuator (one unit)*
*[2] Coded = Switch accepts any PSENcode actuator*
*[3] Fully coded = Switch accepts only one PSENcode actuator, teach-in up to 8 times*
*[4] Unique, fully coded = Switch accepts only one PSENcode actuator, no teach-in facility*
★ *Recommended type for the majority of applications*

*Technical documentation on non-contact, coded safety switches PSENcode:*

Webcode 0365

*Accessories, supplementary products and services:*

From page 62

Webcode 0326

*Online information at www.pilz.com*



# Safety bolts PSENbolt


*with PSEN me1*


*with PSENcode*

*PSEN b1*
*(with PSEN me1S/1AS)*

*PSEN b3*
*(with PSEN cs4.1p)*

**… for safety gates in a rugged industrial environment**

Save the cost of expensive in-house engineering! In conjunction with Pilz safe control technology, PSENbolt safety bolts offer you the safe, complete solution comprising safety switch, handle and bolt.

PSENbolt are particularly suitable for safety gates that are difficult to adjust or in areas where safety gates are often opened and closed, as a long material service life is guaranteed as well as providing protection against defeat and manipulation.

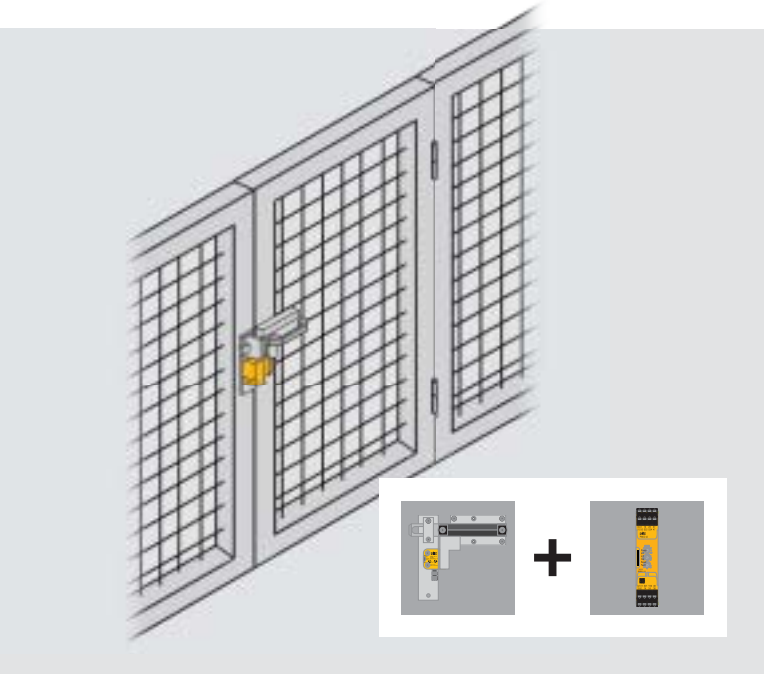
**Longer service life for the integrated safety switch**

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.

## Type code for PSENbolt

**PSEN b4.1**

| Product area<br>Pilz SENsors | Escape release/<br>locking pin | Can be combined with |
|---|---|---|
| **Product range**<br>**b – PSENbolt** | | |
| **Operation**<br>Depends on the selected safety switch:<br>▸ Mechanical<br>▸ Magnetic<br>▸ Coded | 1 Without escape release, without locking pin<br>2 With escape release, with locking pin, can be deactivated<br>2.1 With escape release, with locking pin, cannot be deactivated | ▸ Mechanical safety switches PSENmech with guard locking (PSEN me1 series)<br>▸ Non-contact, coded safety switches PSENcode (PSEN cs1, PSEN cs2 series) |
| | 3 Without escape release, without locking pin<br>4 With escape release, with locking pin, can be deactivated<br>**4.1 With escape release, with locking pin, cannot be deactivated** | ▸ Non-contact, magnetic safety switches PSENmag (PSEN ma1.4 series)<br>▸ Non-contact, coded safety switches PSENcode (PSEN cs3, PSEN cs4 series) |



*The optimum solution: Monitoring swing gates using the safety bolt PSENbolt and PNOZsigma safety relay.*

**Your benefits at a glance**

- Cost-optimised solution comprising safety switch, handle and bolt:
  - Save time and money in creating your own safety bolts
  - Reduce the effort involved in logistics and ordering
  - Compact design saves space
  - Long-lasting thanks to mechanical protection for safety switch
- High availability for your plant:
  - Highest protection against manipulation and defeat with safety switches PSENcode (coding)
  - Locking pin protects the bolt from closing unintentionally
  - Emergency release available as an option

*Latest information and technical documentation on safety bolts PSENbolt:*

Webcode 0913

*Accessories, supplementary products and services:*

From page 62

Webcode 0326

*Online information at www.pilz.com*

## Selection guide – PSENbolt safety bolt

*PSEN b1*

*PSEN b3*

| Type | Can be combined with | Escape release | Locking pin | Order number[3] |
|---|---|---|---|---|
| **PSEN b1** | ▸ PSEN me1<br>▸ PSEN cs1<br>▸ PSEN cs2 | | | 540010 |
| **PSEN b2** | | ◆ | ◆[1] | 540020 |
| **PSEN b2.1** | | ◆ | ◆[2] | 540021 |
| **PSEN b3** | ▸ PSEN ma1.4<br>▸ PSEN cs3<br>▸ PSEN cs4 | | | 540030 |
| **PSEN b4** | | ◆ | ◆[1] | 540040 |
| **PSEN b4.1** | | ◆ | ◆[2] | 540041 |

*[1] Can be deactivated [2] Cannot be deactivated*
*[3] Order number for handle and bolt*
*Approvals depend on the selected safety switch*



# Safe hinge switches PSENhinge

*PSEN hs1.1p*

**... for guards**

Safe hinge switches PSENhinge provide a safe, complete solution for guards, comprising hinge and safety switch. Enjoy the benefits of a safe, complete solution in conjunction with Pilz control technology.

PSENhinge are suitable for rotatable and hinged gates as well as flaps. Users benefit from higher plant availability because PSENhinge are manipulation-proof, as they are concealed within the safeguard.

Safe hinge switches from Pilz can also be used where there are strict hygiene regulations or heavy soiling, as they provide IP67 protection.

**With readjustable switching point**

Designed as one functional and installation unit, PSENhinge offer a high level of flexibility in installation, connection and adjustment. They allow systems to be attached to the right or left, for optimum cable feed at a switching point between 0° and 270°.

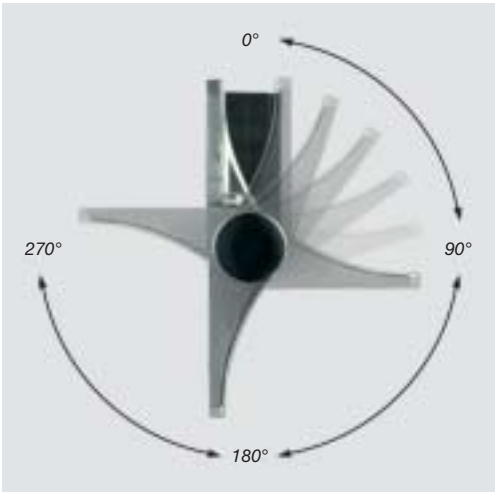
**Maximum flexibility**

Even after setting the switching point, the user can still correct the setting of the hinge with the integrated precision adjustment system. In this way, the user can employ a change kit to redefine the switching point, even when upgrading the plant.

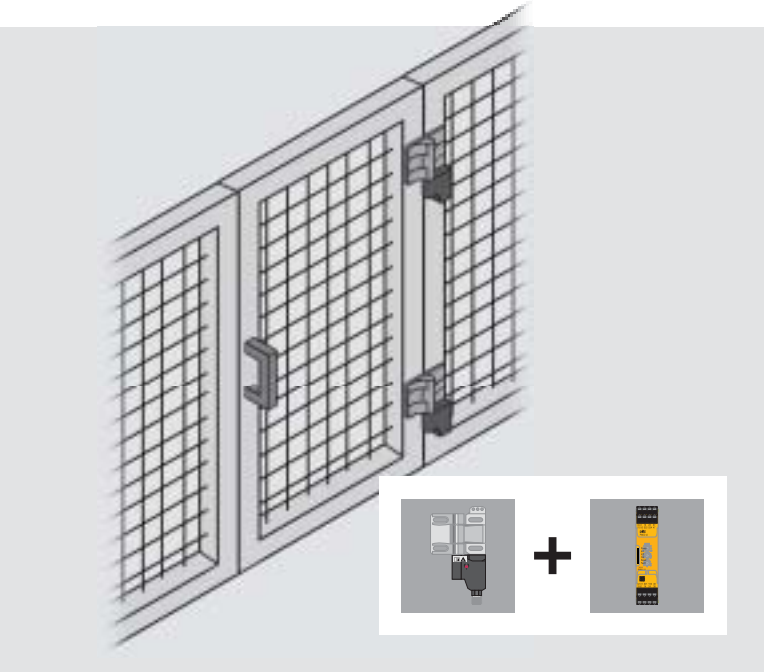
**Type code for PSENhinge**

**PSEN hs1.1p**

| Product area<br>Pilz **SEN**sors | Contacts | Door stop | Connection |
|---|---|---|---|
| **Product range**<br>**hs – PSENhinge** | **1 NC/NC** | **1 Right**<br>2 Left | **p Connector, M12, 4-pin** |
| **Operation**<br>Mechanical | | | |




*High level of flexibility for the design: the switching point on PSENhinge can be set between 0° and 270°.*



*The optimum solution: Monitoring swing gates safely using the hinge switches PSENhinge and PNOZsigma safety relay.*

## Your benefits at a glance

- Safe, complete solution for rotatable/hinged guards, comprising hinge and safety switch
- In conjunction with Pilz control systems, can be used for applications with high safety requirements
- Manipulation-proof and space-saving, as it's integrated directly into the safeguard
- Highest flexibility in installation, connection and adjustment:
  - Switching point is free to set from 0° to 270° and is readjustable
  - Protection type IP67
- User-friendly:
  - Slot fastening for mounting on profiles
  - Simple readjustment by means of integrated precision adjustment system
  - Systems can be attached to right and left
- Low maintenance:
  - Rugged version for high mechanical loads
  - Resistant to soiling

## Selection guide – Safe hinge switches PSENhinge

*PSEN hs1.1p*

| Type | Door stop | Order number [1)] |
|---|---|---|
| **PSEN hs1.1p** | Right | 570270 |
| **PSEN hs1.2p** | Left | 570271 |

*[1)] Order number for hinge and safety switch*

### Common features

- Hinge switches for monitoring the position of movable guards in accordance with EN 60947-5-3
- Can be used in applications up to PL e of EN ISO 13849-1, SIL CL 3 of EN/IEC 62061 and Cat. 4 of EN 954-1 (with additional measures)
- Connection type: Connector, M12, 4-pin
- Contacts: 2 NC
- Protection type: IP67
- Plastic-bodied design

*Latest information and technical documentation on safe hinge switches PSENhinge:*

Webcode 5575

*Accessories, supplementary products and services:*

From page 62

Webcode 0326

*Online information at www.pilz.com*



# Safety gate systems

*PSEN sl-0.5p*

*PSEN sl-1.0p*

*PSEN sg1c-2/1*

**… for protecting guards**

When a guard is opened, hazardous machine movements must be stopped in accordance with EN 1088 and a restart must be prevented. It must not be possible to either defeat or manipulate the guards.

Pilz safety gate systems are particularly effective in meeting this requirement and incorporate additional functionalities for greater economy:

- PSENslock – Safety gate monitoring with process guarding
- PSENsgate – Safety gate monitoring, safe guard locking and control elements

## Application overview and distinction between safety gate systems

| Type | PSENslock | PSENsgate |
|---|---|---|
| **Application on guards** | | |
| **Covers** | ◆ | |
| **Flaps** | ◆ | |
| **Hinged safety gates** | ◆ | ◆ |
| **Sliding safety gates** | ◆ | (◆) [1] |
| **Operating principle** | ▸ Non-contact, coded<br>▸ Transponder technology | ▸ Mechanical, coded<br>▸ Transponder technology |
| **Manipulation protection** | Very high | Very high |
| **Safe position monitoring** | Yes | Yes |
| **Guard locking** | Process guard locking (magnetic interlock) | Safe guard locking up to<br>▸ PL e of EN ISO 13849-1<br>▸ SIL CL 3 of EN/IEC 62061 |
| **Auxiliary/escape release** | No | Integrated |
| **Emergency stop pushbutton** | No | Integrated |
| **Illuminated button for request and reset** | No | 2 or 2+2 additional pushbuttons |
| **Additional functions** | ▸ Series connection possible with PSENini, PSENcode, PSENslock, PSENsgate | ▸ Series connection possible with PSENini, PSENcode, PSENslock, PSENsgate<br>▸ Broken pin and broken bolt are safely detected<br>▸ Closing lock (padlock on the bolt)<br>▸ Enabling switch can be connected |

[1] *Limited suitability, without escape release*

*Keep up-to-date on safety gate systems:*

Webcode 4901

*Online information at www.pilz.com*



# Safety gate systems PSENslock

*PSEN sl-0.5p*

*PSEN sl-1.0p*

**… safe position monitoring with process guarding in one system**

Safety gate systems PSENslock provide secure safety gate monitoring with a non-contact magnetic interlock of 500 N or 1,000 N (BG GS-ET 19) within one system.

With this combination of safe position monitoring and process guarding, PSENslock are designed for the highest category applications.

**Stringent protection of man and machine**

PSENslock are a safe alternative to existing mechanical technology. Highest possible manipulation protection and low wear and tear ensure a long service life and protect your investment.

Combined with Pilz control technology, you receive a safe, complete solution for guard monitoring.

**Save time and costs during commissioning**

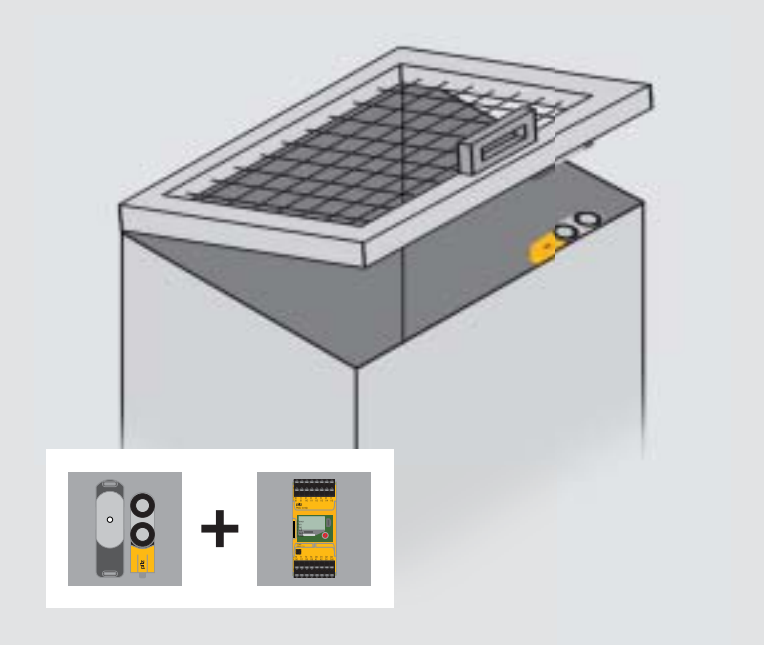
Thanks to its flexible connections, PSENslock can be installed and commissioned quickly and easily. They are optimised for mounting on the popular 45 mm profiles.

You can also save time and costs through series connection, even with the very highest safety requirements.

**Type code for PSENslock**

**PSEN sl-1.0p 2.2**

| Product area<br>Pilz **SEN**sors | Magnetic powered | Connection | Coding |
|---|---|---|---|
| **Product range**<br>**sl – PSENslock** | 0.5 500 N<br>**1.0 1,000 N** | n Connector, M12, 5-pin<br>**p Connector, M12, 8-pin** | 1.1 Coded<br>2.1 Fully coded<br>**2.2 Unique, fully coded** |
| **Operation**<br>▸ Non-contact, coded<br>▸ Transponder (RFID)<br>▸ With safe semiconductor outputs | | | |



*The optimum solution: Guard locking on the flap using the safety gate system PSENslock, evaluated using the safety relay PNOZmulti Mini.*

**Your benefits at a glance**

- System optimised for safe position monitoring with process guarding
- High availability for your plant:
  - Suitable for the highest safety requirements
  - Highest level of manipulation protection (coding)
  - Process protection via magnetic guard locking
- Fast commissioning:
  - Four assembly directions
  - Tolerant to gate misalignment
  - Flexible connection via connector
- User-friendly diagnostics via double-sided LED display
- Save power, as the magnet on PSENslock is optimised for energy efficiency

**Selection guide**

The product selection guide
can be found on page 38–39.

*Keep up-to-date on safety gate systems PSENslock:*

Webcode 4898

*Online information at www.pilz.com*



# Safety gate systems PSENsgate


*PSEN sg1c-2/1*

**… the integrated system for safety gate monitoring**

PSENsgate combine secure safety gate monitoring, safe guard locking and control elements in just one system. And that includes additional functions such as emergency stop and escape release.

Connected in series with other PSENsgate, PSENini, PSENcode and/or PSENslock sensors, and in conjunction with Pilz control technology, what you get is a safe, complete solution to suit all categories.

**Save time and components**

You can benefit from a high savings potential: use just one ready-to-install system and all your safety functions and control elements are integrated.

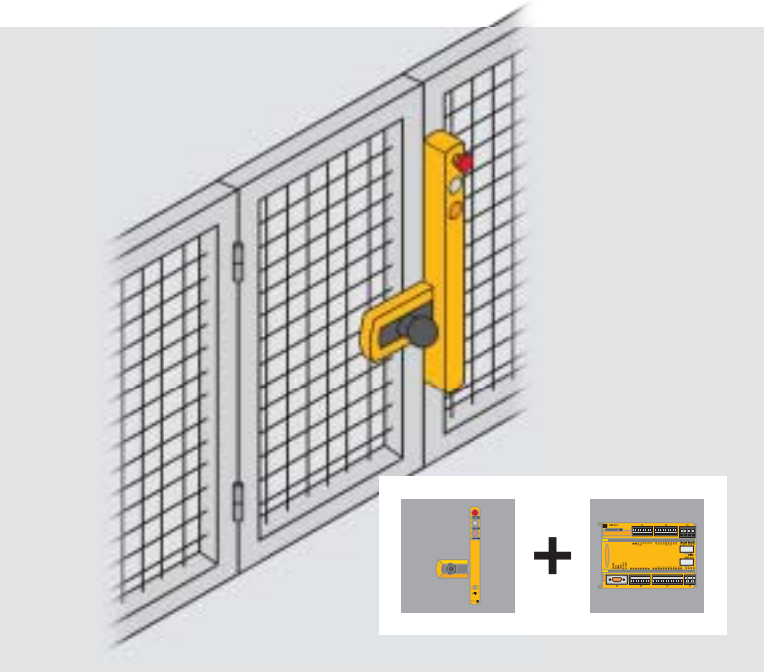
With PSENsgate you save time and money during configuration, design, documentation, purchasing and installation.

So we can help you achieve an efficient time-to-market.

## Type code for PSENsgate

**PSEN sg1c-4/1**

| Product area<br>Pilz **SEN**sors | Type | Connection via | Number of request or reset buttons | Number of emergency stop devices |
|---|---|---|---|---|
| **Product range**<br>**sg – PSENsgate** | **1 With safe guard locking and safety gate monitoring** | **c Spring-loaded terminal, plug in** | 2 2 illuminated buttons<br>**4 4 illuminated buttons** | **1 1 emergency stop device** |
| **Operation**<br>▸ Mechanical, coded<br>▸ Transponder (RFID)<br>▸ With safe semiconductor outputs | | | | |



*The optimum solution: Monitoring a safety gate using the safety gate system PSENsgate and the control system PNOZmulti.*

**Your benefits at a glance**

- Combination of safety gate monitoring, safe guard locking and broken bolt monitoring all in one system – including emergency stop devices and control elements
- Reduced installation and wiring effort due to integrated control elements and the ability for series connection
- Highest category with just one switch per safety gate: for protection of personnel and plant
- Unit width of 45 mm = suitable for 45 mm profiles
- Diagnostics enable fast reaction times to status changes
- Integrated emergency stop removes the need for an evaluation device and expansion modules
- Safe, complete solution when combined with Pilz control technology
- Save power, PSENsgate is optimised for energy efficiency

*Keep up-to-date on safety gate systems PSENsgate:*

Webcode 5546

*Online information at www.pilz.com*



# Selection guide – Safety gate systems

## Common features

- Safety gate systems for monitoring the position of movable guards in accordance with EN 60947-5-3
- Suitable for applications up to PL e of EN ISO 13849-1, SIL CL 3 of EN/IEC 62061 and Cat. 4 of EN 954-1
- Series connection in combination with PSENslock, PSENsgate, PSENini, PSENcode up to PL e of EN ISO 13849-1, SIL CL 3 of EN/IEC 62061 and Cat. 4 of EN 954-1

## Safety gate systems PSENslock

*PSEN sl-0.5p*

*PSEN sl-1.0p*

| Type | Type of coding |
|---|---|
| **PSEN sl-0.5p 1.1/PSEN sl-0.5** | Coded [3] |
| **PSEN sl-0.5n 1.1/PSEN sl-0.5** | Coded [3] |
| **PSEN sl-0.5p 2.1/PSEN sl-0.5** | Fully coded [4] |
| **PSEN sl-0.5n 2.1/PSEN sl-0.5** | Fully coded [4] |
| **PSEN sl-0.5p 2.2/PSEN sl-0.5** | Unique, fully coded [5] |
| **PSEN sl-0.5n 2.2/PSEN sl-0.5** | Unique, fully coded [5] |
| **PSEN sl-1.0p 1.1/PSEN sl-1.0** | Coded [3] |
| **PSEN sl-1.0p 1.1 VA/PSEN sl-1.0** | Coded [3] |
| **PSEN sl-1.0n 1.1/PSEN sl-1.0** | Coded [3] |
| **PSEN sl-1.0p 2.1/PSEN sl-1.0** | Fully coded [4] |
| **PSEN sl-1.0n 2.1/PSEN sl-1.0** | Fully coded [4] |
| **PSEN sl-1.0p 2.2/PSEN sl-1.0** | Unique, fully coded [5] |
| **PSEN sl-1.0n 2.2/PSEN sl-1.0** | Unique, fully coded [5] |

### Electrical data

- Supply voltage: 24 VDC
- Safety outputs: 2
- Signal output: 1

## Safety gate systems PSENsgate

*PSEN sg1c-2/1*

| Type |
|---|
| **PSEN sg1c-2/1** |
| **PSEN sg1c-4/1** |

### Electrical data

- Supply voltage: 24 VDC
- Safety outputs: 2 (semiconductor, max. 500 mA each)
- Signal output: 500 mA
- "Safe range" input (solenoid pin): 1.5 A, 150 ms
- Power consumption depends on configuration (gate locked): Max. 2 W
- Voltage tolerance: -15/+10 %

| Holding force | Power consumption [1] | Dimensions (H x W x D) in mm | | Connection type | Order number [2] |
|---|---|---|---|---|---|
| | | Safety guard locking device | Actuator | | |
| 500 N | 4.8 W | 122 x 45 x 44 | 138 x 52 x 23 | Connector, M12, 8-pin | 570500 |
| 500 N | 4.8 W | 122 x 45 x 44 | 138 x 52 x 23 | Connector, M12, 5-pin | 570503 |
| 500 N | 4.8 W | 122 x 45 x 44 | 138 x 52 x 23 | Connector, M12, 8-pin | 570501 |
| 500 N | 4.8 W | 122 x 45 x 44 | 138 x 52 x 23 | Connector, M12, 5-pin | 570504 |
| 500 N | 4.8 W | 122 x 45 x 44 | 138 x 52 x 23 | Connector, M12, 8-pin | 570502 |
| 500 N | 4.8 W | 122 x 45 x 44 | 138 x 52 x 23 | Connector, M12, 5-pin | 570505 |
| 1,000 N | 7.2 W | 172 x 45 x 44 | 188 x 52 x 22 | Connector, M12, 8-pin | 570600 |
| 1,000 N | 7.2 W | 172 x 45 x 44 | 188 x 52 x 22 | Connector, M12, 8-pin | 570630 |
| 1,000 N | 7.2 W | 172 x 45 x 44 | 188 x 52 x 22 | Connector, M12, 5-pin | 570603 |
| 1,000 N | 7.2 W | 172 x 45 x 44 | 188 x 52 x 22 | Connector, M12, 8-pin | 570601 |
| 1,000 N | 7.2 W | 172 x 45 x 44 | 188 x 52 x 22 | Connector, M12, 5-pin | 570604 |
| 1,000 N | 7.2 W | 172 x 45 x 44 | 188 x 52 x 22 | Connector, M12, 8-pin | 570602 |
| 1,000 N | 7.2 W | 172 x 45 x 44 | 188 x 52 x 22 | Connector, M12, 5-pin | 570605 |

### Mechanical data

- Vertical and lateral offset: +/- 3 / +/-5 mm
- Protection type: IP67

*[1] Gate locked [2] Order number for sensor and actuator (one unit)*
*[3] Switch accepts any PSENslock actuator*
*[4] Switch accepts only one PSENslock actuator, teach-in up to 8 times*
*[5] Switch accepts only one PSENslock actuator, no teach-in facility*
*★ Recommended type for the majority of applications*

| Number of pushbuttons | Number of emergency stop devices | Dimensions (H x W x D) in mm | Connection type | Order number |
|---|---|---|---|---|
| 2 [6] | 1 | 466 x 200 x 104.5 | Plug-in terminals | 570700 |
| 4 [7] | 1 | 556 x 200 x 104.5 | Plug-in terminals | 570701 |

### Mechanical data

- Vertical and lateral offset: +/-5 / +/-5 mm
- Protection type: IP65/54
- Holding force, swing gate: 2,000 N
- Holding force, bolt (holding pin): 1,000 N
- Connection type: Plug-in spring-loaded terminals

*[6] 2 illuminated buttons: 1 request button, 1 reset button,*
*[7] 4 illuminated buttons: 1 request button, 1 reset button, 2 free pushbuttons (100 mA)*
*★ Recommended type for the majority of applications*

*Technical documentation on safety gate systems:*

- *PSENslock*

Webcode 4898

- *PSENsgate*

Webcode 5546

*Accessories, supplementary products and services:*

From page 62

Webcode 0326

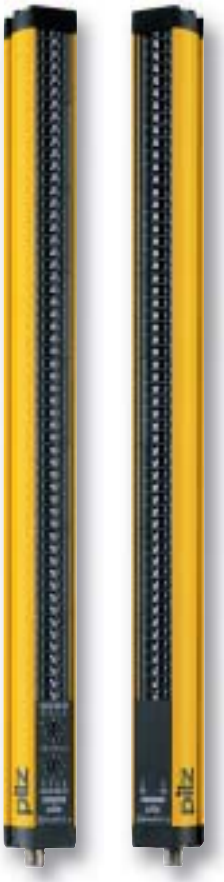
*Online information at www.pilz.com*



# Safety light beams, curtains and grids

*PSEN op4F…/1*

SafetyBUS p®



*PSEN opSB-4F*

**… the ideal protection when the production process requires active intervention**

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 offer greater productivity, while safeguarding access to the work process. Save costs:

- PSENopt devices have a compact design and therefore save space
- They can quickly be incorporated, operated and maintained on your plant
- Protected fields and detection capability can be set up to be process-oriented

**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. 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

**PSENopt – with semiconductor outputs**

PSENopt light beams, curtains and grids with semiconductor outputs are suitable for all Type 2 and 4 applications in accordance with EN/IEC 61496-1/-2.
Read more from page 42.

**PSENopt SB – for SafetyBUS p applications**

The safe, open bus system SafetyBUS p in conjunction with PSENopt SB is recommended for cost-effective monitoring of a large light grid application. Only this way can you reduce the amount of work involved by using compatible system components.
Read more from page 50.

**Select the right PSENopt to conform to the standard**

Carry out a safety assessment 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 electrosensitive 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 safe semiconductor outputs | With SafetyBUS p interface |
| **Resolution** | Finger, hand, body protection as well as access protection | Finger, hand, body protection |
| **Can be used in applications in accordance with** | | |
| **EN ISO 13849-1** | PL c and PL e | PL e |
| **EN/IEC 62061** | SIL CL 1 and SIL CL 3 | SIL CL 3 |
| **EN 954-1** | Category 2 and 4 | Category 4 |
| **Approved to 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 … 1,800 mm | 300 … 1,650 mm |
| **Operating range** | 0.2 … 50 m (depending on type) | 0.2 … 25 m (depending on type) |
| **Light grid reaction time** | 320 µs … 68 ms (depending on type) | 55 … 105 ms (depending on type) |

*Keep up-to-date on light beams, curtains and grids PSENopt:*

Webcode 0311

*Online information at www.pilz.com*



# Light beams, curtains and grids with semi

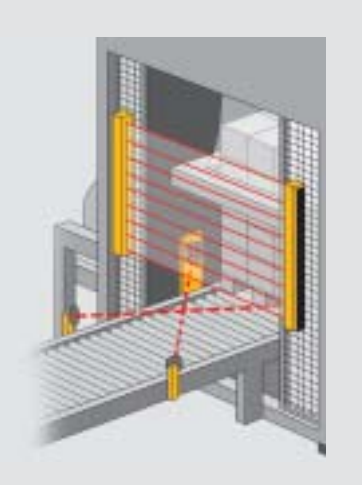
*PSEN op4F…/1*

**… for finger, hand and body protection**

Thanks to their compact dimensions, simple installation technology and optimum performance, PSENopt are an ideal solution when 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 with crossed muting sensors.*

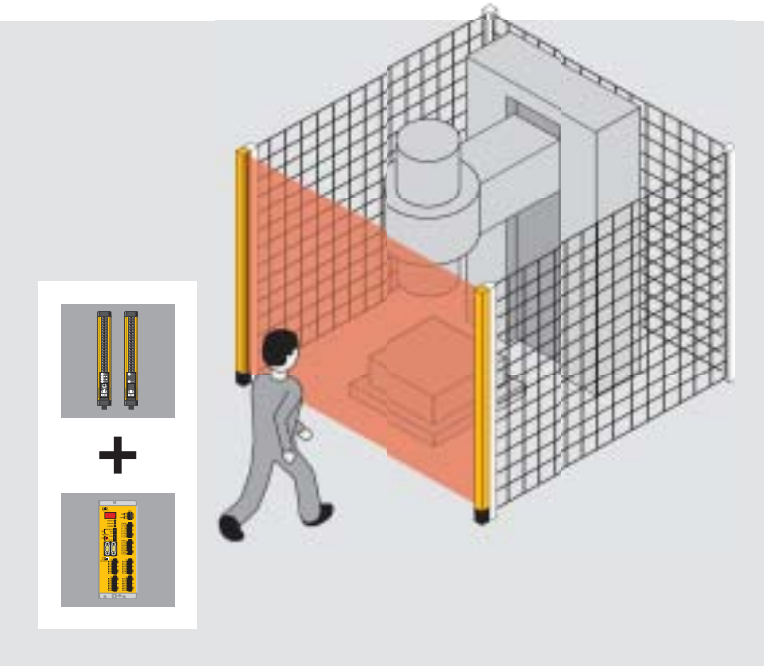
## Type code for PSENopt

**PSEN op4F-s-14-120/1**

| Product area<br>Pilz SENsors | Approval | Resolution | Functions | Resolution/No. of beams | Feature/Height of protected field | Generation |
|---|---|---|---|---|---|---|
| **Product range op – PSENopt** | 2 Type 2<br>**4 Type 4** | S Access protection (light beam device)<br>**F Finger protection (light curtain)**<br>H Hand protection (light curtain)<br>B Body protection (light grid) | _ Muting (total/partial)<br>**s Standard** [1]<br>b Blanking [1]<br>m Cascading Master [1]<br>bm Blanking/ Cascading Master [1]<br>sl Cascading Slave [1]<br>S Linear version<br>L L-Version<br>T T-Version | 1 1 beam<br>2 2 beams<br>3 3 beams<br>4 4 beams<br>**14 14 mm**<br>30 30 mm | 1 Infrared<br>2 Laser<br>015 150 mm<br>030 300 mm<br>045 450 mm<br>050 500 mm<br>060 600 mm<br>075 750 mm<br>080 800 mm<br>090 900 mm<br>105 1,050 mm<br>**120 1,200 mm**<br>135 1,350 mm<br>150 1,500 mm<br>165 1,650 mm<br>180 1,800 mm | **/1 New generation PSENopt** |
| **Operation**<br>▸ Non-contact, optical, 2D (area monitoring)<br>▸ With safe semiconductor outputs | Approved in accordance with EN/IEC 61496-1/-2 | | | | | |

[1] *incl. feedback loop monitoring*

# conductor outputs – PSENopt



*The optimum solution: Monitoring the infeed area on a press using the light grid PSENopt and control system PSScompact.*

**Your benefits at a glance**

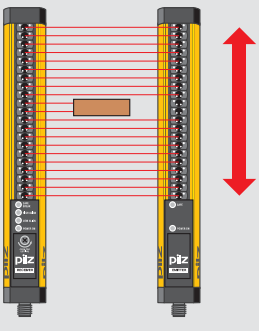
- Economical:
  - Protected fields and detection capability can be set up to be process-oriented
  - Cost savings with PSENopt integration, operation and maintenance
- Functionalities which increase the efficiency and availability of your plant:
  - Muting to distinguish between a person and material
  - Cascading function for effective protection against encroachment into and behind the protected area
  - Blanking for a flexible, uninterrupted material flow
- Protection for your investment: open for interfaces from other manufacturers
- Fast installation and commissioning thanks to a rotatable mounting bracket

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

Adjacent protected fields can easily be safeguarded using the cascading function. Just connect master and slave quickly and simply using a convenient plug-in connector; also combines finger and hand protection.

**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.



*Floating blanking:*
*Two beams are blanked out.*
*Any object that obscures more than two beams will be detected.*

*Keep up-to-date on light beams, curtains and grids PSENopt:*

Webcode 0337

*Online information at www.pilz.com*



# Selection guide – PSENopt

## Access protection (1 beam) – Light beam devices PSEN op2S/4S

**Common features**

- In conjunction with
  - Configurable control systems PNOZmulti: PNOZ m0p, PNOZ m1p, PNOZ m2p
  - Programmable control system PSS: PSS DI2O T
- Supply voltage: 20 … 30 VDC

*PSEN op4S-1-2*

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

## Hand and body protection in accordance with EN/IEC 61496-1/-2: Type 2 – Light curtains, grids PSEN op2H,

**Common features**

- Compliant and approved in accordance with EN/IEC 61508
- For use in applications up to
  - PL e of EN ISO 13849-1
  - SIL CL 3 of EN/IEC 62061
  - Cat. 4 of EN 954-1
- 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)
- Semiconductor outputs
- Supply voltage: 24 VDC
- Connection PSEN op2H:
  - Receiver Rx: Connector, M12, 5-pin
  - Transmitter Tx: Connector, M12, 4-pin
- Connection PSEN op2B:
  - Receiver Rx: Connector, M12, 8-pin
  - Transmitter Tx: Connector, M12, 4-pin

*PSEN op2H-s-30-060/1*

*PSEN op2B-3-080*

| Type | Approved to EN/IEC 61496-1/-2 |
|---|---|
| **PSEN op2H-s-30-015/1** | Type 2 |
| **PSEN op2H-s-30-030/1** | Type 2 |
| **PSEN op2H-s-30-045/1** | Type 2 |
| **PSEN op2H-s-30-060/1** | Type 2 |
| **PSEN op2H-s-30-075/1** | Type 2 |
| **PSEN op2H-s-30-090/1** | Type 2 |
| **PSEN op2H-s-30-105/1** | Type 2 |
| **PSEN op2H-s-30-120/1** | Type 2 |
| **PSEN op2H-s-30-135/1** | Type 2 |
| **PSEN op2H-s-30-150/1** | Type 2 |
| **PSEN op2H-s-30-165/1** | Type 2 |
| **PSEN op2H-s-30-180/1** | 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 |

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

## PSEN op2B

| Resolution/ No. of beams | Height of protected field | Operating range | PSENopt reaction time | Dimensions | Order number [1] |
|---|---|---|---|---|---|
| Hand (30 mm) | 150 mm | 0.2 … 19 m | 8 ms | 31 x 32 mm | 630720 |
| Hand (30 mm) | 300 mm | 0.2 … 19 m | 9 ms | 31 x 32 mm | 630721 |
| Hand (30 mm) | 450 mm | 0.2 … 19 m | 11 ms | 31 x 32 mm | 630722 |
| Hand (30 mm) | 600 mm | 0.2 … 19 m | 12 ms | 31 x 32 mm | 630723 |
| Hand (30 mm) | 750 mm | 0.2 … 19 m | 14 ms | 31 x 32 mm | 630724 |
| Hand (30 mm) | 900 mm | 0.2 … 19 m | 15 ms | 31 x 32 mm | 630725 |
| Hand (30 mm) | 1,050 mm | 0.2 … 19 m | 17 ms | 31 x 32 mm | 630726 |
| Hand (30 mm) | 1,200 mm | 0.2 … 19 m | 18 ms | 31 x 32 mm | 630727 |
| Hand (30 mm) | 1,350 mm | 0.2 … 19 m | 20 ms | 31 x 32 mm | 630728 |
| Hand (30 mm) | 1,500 mm | 0.2 … 19 m | 21 ms | 31 x 32 mm | 630729 |
| Hand (30 mm) | 1,650 mm | 0.2 … 19 m | 23 ms | 31 x 32 mm | 630730 |
| Hand (30 mm) | 1,800 mm | 0.2 … 19 m | 24 ms | 31 x 32 mm | 630731 |
| Body (2 beams) | 500 mm | 0.5 … 50 m | 14 ms | 35 x 40 mm | 630200 |
| Body (3 beams) | 800 mm | 0.5 … 50 m | 14 ms | 35 x 40 mm | 630201 |
| Body (4 beams) | 900 mm | 0.5 … 50 m | 14 ms | 35 x 40 mm | 630202 |
| Body (4 beams) | 1,200 mm | 0.5 … 50 m | 14 ms | 35 x 40 mm | 630203 |

*[1] Order number for transmitter, receiver and mounting bracket respectively (one unit)*

★ *Recommended type for the majority of applications*

*The complete range plus technical documentation on safety light beams, curtains and grids PSENopt:*

Webcode 0337

*Accessories, supplementary products and services:*

From page 62

Webcode 0326

*Online information at www.pilz.com*



# Selection guide – PSENopt

## Hand protection in accordance with EN/IEC 61496-1/-2: Type 4 – Light curtains PSEN op4H

### Common features

- Compliant and approved in accordance with EN/IEC 61508, EN/IEC 61496-1/-2: Type 4
- Resolution: Hand protection (30 mm)
- For use in applications up to
  - PL e of EN ISO 13849-1
  - SIL CL 3 of EN/IEC 62061
  - Cat. 4 of EN 954-1
- Function selection: Test, via DIP switches: manual/automatic reset, feedback loop monitoring
- Connection:
  - Receiver Rx: Connector, M12, 8-pin
  - Transmitter Tx: Connector, M12, 4-pin
  - Slave: Connector, M12, 5-pin
- Safe semiconductor outputs: 2
- Operating range: 0.2 … 19 m
- Supply voltage: 24 VDC
- Dimensions: 35 x 40 mm

*PSEN op4H-s-30-075/1*

*PSEN op4H-b-30-075*

| Type | Reaction time | Functions<br>Blanking |
|---|---|---|
| **150 mm protected field** | | |
| **PSEN op4H-s-30-015/1** | 9 ms | |
| **PSEN op4H-b-30-015** | 16 ms | ◆ |
| **PSEN op4H-bm-30-015** | 16 ms | ◆ |
| **PSEN op4H-sl-30-015** | 16 ms | |
| **300 mm protected field** | | |
| **PSEN op4H-s-30-030/1** | 11 ms | |
| **PSEN op4H-b-30-030** | 20 ms | ◆ |
| **PSEN op4H-bm-30-030** | 20 ms | ◆ |
| **PSEN op4H-sl-30-030** | 20 ms | |
| **450 mm protected field** | | |
| **PSEN op4H-s-30-045/1** | 13 ms | |
| **PSEN op4H-b-30-045** | 23 ms | ◆ |
| **PSEN op4H-bm-30-045** | 23 ms | ◆ |
| **PSEN op4H-sl-30-045** | 23 ms | |
| **600 mm protected field** | | |
| **PSEN op4H-s-30-060/1** | 14 ms | |
| **PSEN op4H-b-30-060** | 25 ms | ◆ |
| **PSEN op4H-m-30-060** | 25 ms | |
| **PSEN op4H-bm-30-060** | 25 ms | ◆ |
| **PSEN op4H-sl-30-060** | 25 ms | |
| **750 mm protected field** | | |
| ★ **PSEN op4H-s-30-075/1** | 16 ms | |
| **PSEN op4H-b-30-075** | 27 ms | ◆ |
| **PSEN op4H-m-30-075** | 27 ms | |
| **PSEN op4H-bm-30-075** | 27 ms | ◆ |
| **PSEN op4H-sl-30-075** | 27 ms | |
| **900 mm protected field** | | |
| ★ **PSEN op4H-s-30-090/1** | 18 ms | |
| **PSEN op4H-b-30-090** | 30 ms | ◆ |
| **PSEN op4H-m-30-090** | 30 ms | |

| Cascading | Order number [1] | Type | Reaction time | Functions: Blanking | Functions: Cascading | Order number [1] |
|---|---|---|---|---|---|---|
| | | ▸ **900 mm protected field** | | | | |
| - | 630760 | **PSEN op4H-bm-30-090** | 30 ms | ◆ | Master | 630675 |
| - | 630630 | **PSEN op4H-sl-30-090** | 30 ms | | Slave | 630695 |
| Master | 630670 | ▸ **1,050 mm protected field** | | | | |
| Slave | 630690 | **PSEN op4H-s-30-105/1** | 19 ms | | - | 630766 |
| | | **PSEN op4H-b-30-105** | 32 ms | ◆ | - | 630636 |
| - | 630761 | **PSEN op4H-m-30-105** | 32 ms | | Master | 630656 |
| - | 630631 | **PSEN op4H-bm-30-105** | 32 ms | ◆ | Master | 630676 |
| Master | 630671 | **PSEN op4H-sl-30-105** | 32 ms | | Slave | 630696 |
| Slave | 630691 | ▸ **1,200 mm protected field** | | | | |
| | | ★ **PSEN op4H-s-30-120/1** | 21 ms | | - | 630767 |
| - | 630762 | **PSEN op4H-b-30-120** | 35 ms | ◆ | - | 630637 |
| - | 630632 | **PSEN op4H-m-30-120** | 35 ms | | Master | 630657 |
| Master | 630672 | **PSEN op4H-bm-30-120** | 35 ms | ◆ | Master | 630677 |
| Slave | 630692 | ▸ **1,350 mm protected field** | | | | |
| | | **PSEN op4H-s-30-135/1** | 23 ms | | - | 630768 |
| - | 630763 | **PSEN op4H-b-30-135** | 38 ms | ◆ | - | 630638 |
| - | 630633 | **PSEN op4H-m-30-135** | 38 ms | | Master | 630658 |
| Master | 630653 | **PSEN op4H-bm-30-135** | 38 ms | ◆ | Master | 630678 |
| Master | 630673 | ▸ **1,500 mm protected field** | | | | |
| Slave | 630693 | **PSEN op4H-s-30-150/1** | 25 ms | | - | 630769 |
| | | **PSEN op4H-b-30-150** | 40 ms | ◆ | - | 630639 |
| - | 630764 | **PSEN op4H-m-30-150** | 40 ms | | Master | 630659 |
| - | 630634 | **PSEN op4H-bm-30-150** | 40 ms | ◆ | Master | 630679 |
| Master | 630654 | ▸ **1,650 mm protected field** | | | | |
| Master | 630674 | **PSEN op4H-s-30-165/1** | 26 ms | | - | 630770 |
| Slave | 630694 | **PSEN op4H-b-30-165** | 43 ms | ◆ | - | 630640 |
| | | **PSEN op4H-m-30-165** | 43 ms | | Master | 630660 |
| - | 630765 | **PSEN op4H-bm-30-165** | 43 ms | ◆ | Master | 630680 |
| - | 630635 | ▸ **1,800 mm protected field** | | | | |
| Master | 630655 | **PSEN op4H-s-30-180/1** | 28 ms | | - | 630771 |

*[1] Order number for transmitter, receiver and mounting bracket respectively (one unit)*

★ *Recommended type for the majority of applications*

*The complete range plus technical documentation on safety light curtains PSENopt:*

Webcode 0337

*Accessories, supplementary products and services:*

From page 62

Webcode 0326

*Online information at www.pilz.com*



# Selection guide – PSENopt

## Finger protection in accordance with EN/IEC 61496-1/-2: Type 4 – Light curtains PSEN op4F

### Common features

- Compliant and approved in accordance with EN/IEC 61508, EN/IEC 61496-1/-2: Type 4
- Resolution:
  Finger protection (14 mm)
- For use in applications up to
  - PL e of EN ISO 13849-1
  - SIL CL 3 of EN/IEC 62061
  - Cat. 4 of EN 954-1
- Function selection:
  Test, via DIP switches:
  Manual/automatic reset,
  feedback loop monitoring
- Connection:
  - Receiver Rx:
    Connector, M12, 8-pin
  - Transmitter Tx:
    Connector, M12, 4-pin
  - Slave: Connector, M12, 5-pin
- Safe semiconductor outputs: 2
- Operating range: 0.2 … 6 m
- Supply voltage: 24 VDC
- Dimensions: 35 x 40 mm

*PSEN op4F-s-14-060/1*

*PSEN op4F-b-14-060*

| Type | Reaction time | Functions<br>Blanking |
|---|---|---|
| **150 mm protected field** | | |
| **PSEN op4F-s-14-015/1** | 11 ms | |
| **PSEN op4F-b-14-015** | 21 ms | ◆ |
| **PSEN op4F-m-14-015** | 21 ms | |
| **PSEN op4F-bm-14-015** | 21 ms | ◆ |
| **PSEN op4F-sl-14-015** | 21 ms | |
| **300 mm protected field** | | |
| **PSEN op4F-s-14-030/1** | 15 ms | |
| **PSEN op4F-b-14-030** | 28 ms | ◆ |
| **PSEN op4F-m-14-030** | 28 ms | |
| **PSEN op4F-bm-14-030** | 28 ms | ◆ |
| **PSEN op4F-sl-14-030** | 28 ms | |
| **450 mm protected field** | | |
| **PSEN op4F-s-14-045/1** | 18 ms | |
| **PSEN op4F-b-14-045** | 35 ms | ◆ |
| **PSEN op4F-m-14-045** | 35 ms | |
| **PSEN op4F-bm-14-045** | 35 ms | ◆ |
| **PSEN op4F-sl-14-045** | 35 ms | |
| **600 mm protected field** | | |
| ★ **PSEN op4F-s-14-060/1** | 22 ms | |
| **PSEN op4F-b-14-060** | 41 ms | ◆ |
| **PSEN op4F-m-14-060** | 41 ms | |
| **PSEN op4F-bm-14-060** | 41 ms | ◆ |
| **PSEN op4F-sl-14-060** | 41 ms | |
| **750 mm protected field** | | |
| ★ **PSEN op4F-s-14-075/1** | 25 ms | |
| **PSEN op4F-b-14-075** | 48 ms | ◆ |
| **PSEN op4F-m-14-075** | 48 ms | |
| **PSEN op4F-bm-14-075** | 48 ms | ◆ |
| **PSEN op4F-sl-14-075** | 48 ms | |

| Cascading | Order number [1] | Type | Reaction time | Functions: Blanking | Functions: Cascading | Order number [1] |
|---|---|---|---|---|---|---|
| | | ▸ **900 mm protected field** | | | | |
| - | 630740 | **PSEN op4F-s-14-090/1** | 29 ms | | - | 630745 |
| - | 630621 | **PSEN op4F-b-14-090** | 55 ms | ◆ | - | 630626 |
| Master | 630641 | **PSEN op4F-m-14-090** | 55 ms | | Master | 630646 |
| Master | 630661 | **PSEN op4F-bm-14-090** | 55 ms | ◆ | Master | 630666 |
| Slave | 630681 | **PSEN op4F-sl-14-090** | 55 ms | | Slave | 630686 |
| | | ▸ **1,050 mm protected field** | | | | |
| - | 630741 | **PSEN op4F-s-14-105/1** | 33 ms | | - | 630746 |
| - | 630622 | **PSEN op4F-b-14-105** | 62 ms | ◆ | - | 630627 |
| Master | 630642 | **PSEN op4F-m-14-105** | 62 ms | | Master | 630647 |
| Master | 630662 | **PSEN op4F-bm-14-105** | 62 ms | ◆ | Master | 630667 |
| Slave | 630682 | **PSEN op4F-sl-14-105** | 62 ms | | Slave | 630687 |
| | | ▸ **1,200 mm protected field** | | | | |
| - | 630742 | **PSEN op4F-s-14-120/1** | 36 ms | | - | 630747 |
| - | 630623 | **PSEN op4F-b-14-120** | 68 ms | ◆ | - | 630628 |
| Master | 630643 | **PSEN op4F-m-14-120** | 68 ms | | Master | 630648 |
| Master | 630663 | **PSEN op4F-bm-14-120** | 68 ms | ◆ | Master | 630668 |
| Slave | 630683 | **PSEN op4F-sl-14-120** | 68 ms | | Slave | 630688 |
| | | ▸ **1,350 mm protected field** | | | | |
| - | 630743 | **PSEN op4F-s-14-135/1** | 40 ms | | - | 630748 |
| - | 630624 | ▸ **1,500 mm protected field** | | | | |
| Master | 630644 | **PSEN op4F-s-14-150/1** | 43 ms | | - | 630749 |
| Master | 630664 | ▸ **1,650 mm protected field** | | | | |
| Slave | 630684 | **PSEN op4F-s-14-165/1** | 47 ms | | - | 630750 |
| | | ▸ **1,800 mm protected field** | | | | |
| - | 630744 | **PSEN op4F-s-14-180/1** | 50 ms | | - | 630751 |
| - | 630625 | | | | | |
| Master | 630645 | | | | | |
| Master | 630665 | | | | | |
| Slave | 630685 | | | | | |

*[1] Order number for transmitter, receiver and mounting bracket respectively (one unit)*

★ *Recommended type for the majority of applications*

*Technical documentation on safety light curtains PSENopt:*

Webcode 0337

*Accessories, supplementary products and services:*

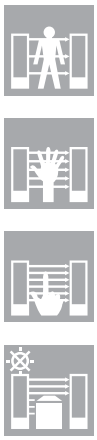
From page 62

Webcode 0326

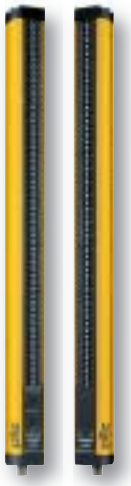
*Online information at www.pilz.com*



# Safety light curtains and grids with Safety



SafetyBUS p®



*PSENopt SB*

**… for extensive SafetyBUS p applications**

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 and fewer components**

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

**Rapid plant expansion**

All the settings relating to the light grid are stored centrally on 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 programmable control system PSS.

**Diagnostics make all the difference!**

The ability to diagnose fault conditions represents the key difference from a classic light curtain connection.

**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 with the programming software PSS WIN-PRO
- Reduced downtimes
  - 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

**Additional functions relating to the PSENopt SB**

- Internal light grid functions:
  - Muting (total/partial)
  - OSSD
  - Diagnostics
  - Reset (local and from PSS)
  - Test (local and from PSS)
- Additional periphery functions, connected directly to the light grid:
  - 2 x muting sensor
  - 1 x muting lamp, monitored

**Type code for PSENopt SB**

## PSEN opSB-4H-30-135

| Product area<br>Pilz **SEN**sors | Approval | Resolution | Resolution/<br>No. of beams | Feature/Height<br>of protected field |
|---|---|---|---|---|
| **Product range<br>opSB – PSENopt SB** | **4 Type 4** | F Finger protection (light curtain) | 2 2 beams | 030 300 mm |
| **Operation** | Approved in accordance with EN/IEC 61496-1/-2 | **H Hand protection (light curtain)** | 3 3 beams | 045 450 mm |
| ▸ Non-contact, optical, 2D (area monitoring) | | B Body protection (light grid) | 4 4 beams | 050 500 mm |
| ▸ With SafetyBUS p interface | | | 14 14 mm | 060 600 mm |
| ▸ Integral functions: Total/partial muting | | | **30 30 mm** | 075 750 mm |
| | | | | 080 800 mm |
| | | | | 090 900 mm |
| | | | | 105 1,050 mm |
| | | | | 120 1,200 mm |
| | | | | **135 1,350 mm** |
| | | | | 150 1,500 mm |
| | | | | 165 1,650 mm |
| | | | | 180 1,800 mm |

# BUS p® interface – PSENopt SB

## Finger, hand and body protection – PSEN opSB

*PSEN opSB-4F*

*PSEN opSB-4H*

*PSEN opSB-4B*

| Type | Height of protected field | Reaction time | Order number [1] |
|---|---|---|---|
| **Finger protection (14 mm)** | | | |
| **PSEN opSB-4F-14-030** | 300 mm | 75 ms | 630351 |
| **PSEN opSB-4F-14-045** | 450 mm | 82 ms | 630352 |
| **PSEN opSB-4F-14-060** | 600 mm | 90 ms | 630353 |
| **PSEN opSB-4F-14-075** | 750 mm | 97 ms | 630354 |
| **PSEN opSB-4F-14-090** | 900 mm | 105 ms | 630355 |
| **Hand protection (30 mm)** | | | |
| **PSEN opSB-4H-30-030** | 300 mm | 58 ms | 630451 |
| **PSEN opSB-4H-30-045** | 450 mm | 61 ms | 630452 |
| **PSEN opSB-4H-30-060** | 600 mm | 64 ms | 630453 |
| **PSEN opSB-4H-30-075** | 750 mm | 67 ms | 630454 |
| **PSEN opSB-4H-30-090** | 900 mm | 70 ms | 630455 |
| **PSEN opSB-4H-30-105** | 1,050 mm | 72 ms | 630456 |
| **PSEN opSB-4H-30-120** | 1,200 mm | 75 ms | 630457 |
| **PSEN opSB-4H-30-135** | 1,350 mm | 78 ms | 630458 |
| **PSEN opSB-4H-30-150** | 1,500 mm | 81 ms | 630459 |
| **PSEN opSB-4H-30-165** | 1,650 mm | 84 ms | 630460 |
| **Body protection** | | | |
| **PSEN opSB-4B-2-050** | 500 mm | 55 ms | 630550 |
| **PSEN opSB-4B-3-080** | 800 mm | 55 ms | 630551 |
| **PSEN opSB-4B-4-090** | 900 mm | 55 ms | 630552 |
| **PSEN opSB-4B-4-120** | 1,200 mm | 55 ms | 630553 |

*[1] Order number for transmitter, receiver and mounting bracket respectively (one unit)*

### Common features

- Compliant and approved in accordance with EN/IEC 61508 and EN/IEC 61496-1/-2: Type 4
- For use in applications up to
  - PL e of EN ISO 13849-1
  - SIL CL 3 of EN/IEC 62061
  - Cat. 4 of EN 954-1
- Connection: Receiver Rx: Connector, M12, 8 and 5-pin Transmitter Tx: Connector, M12, 4-pin
- Supply voltage: 24 VDC
- Operating range:
  - PSEN opSB-4F: 0.2 … 6 m
  - PSEN opSB-4H: 0.2 … 15 m
  - PSEN opSB-4B: 0.5 … 25 m
- Dimensions: 35 x 40 mm

*Technical documentation on safety light beams, curtains and grids PSENopt SB:*

Webcode 0347

*Accessories, supplementary products and services:*

From page 62

Webcode 0326

*Online information at www.pilz.com*



# Camera-based protection and measuring

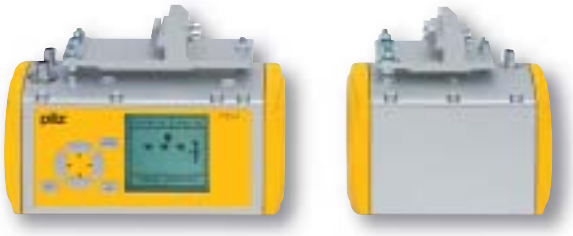

*Bending angle is recorded*


*Short reaction time*

*Innovative optical system "vision parallel"*

*Operator protection*

*Resistant to vibration, diffused light and interference*



*PSENvip RL D Set*

**… safe press braking**

Camera-based protection and measuring systems PSENvip are mobile protection systems used to monitor press brakes safely. When installed on the upper die, the systems detect even the smallest foreign body in the protected field between the transmitter and receiver.

**Innovative optical system for high productivity**

An innovative optical system is used: the visible light beams are transmitted to the receiver via a telecentric lens (vision parallel). As a result, PSENvip provides high availability and therefore better productivity compared to laser-based systems.

PSENvip are insensitive to reflections and external/diffused light, as well as vibration and temperature stratification (e.g. due to heated tools). The longer service life of the light source reduces maintenance costs.

As the light is safe for eyes, PSENvip provides a higher level of safety than conventional systems.

**Fast, simple original equipment and tool change**

Precision adjustment on original equipment and after tool change can be made quickly and simply thanks to the innovative technology and software. This reduces setup times to a minimum.

In conjunction with descriptive information on the display, it guarantees productive work practices in complete safety. Time savings and intuitive handling make for happy operators.

**Forming technology more efficient than ever: thanks to automatic bending angle measurement**

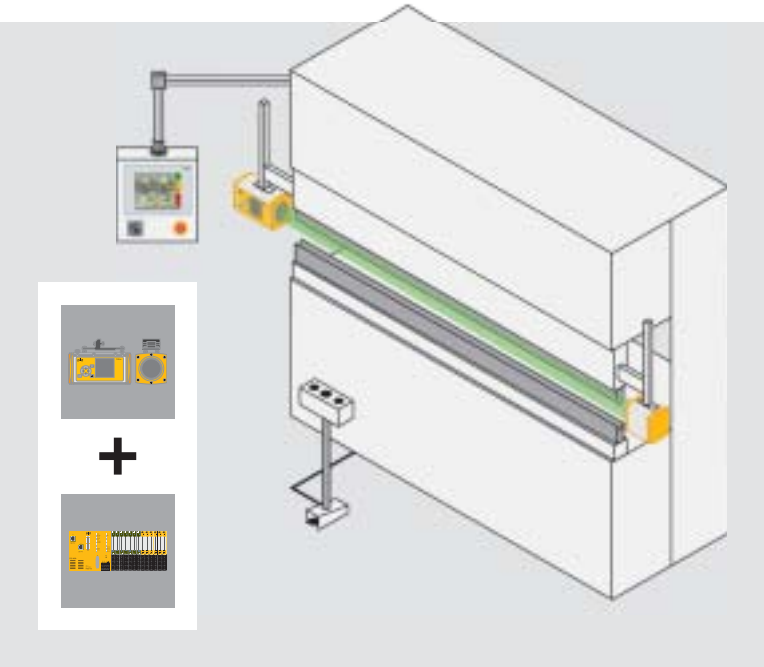
PSENvip records relevant control data from the bending process: the plate is detected automatically and the bending angle measured. Consistently high production quality and easy handling bring competitive advantages.

**Type code for PSENvip**

**PSENvip RL D M Set**

| Product area | Transmitter/ receiver | Display (receiver) | Measuring function (receiver) | Scope of supply |
|---|---|---|---|---|
| **Product range** vip – PSENvip | T Transmitter<br>**RL Receiver, left** | **D With display** | _ Without bending angle measurement<br>**M With bending angle measurement** | **Set Unit comprising transmitter and receiver** |
| **Operation** Non-contact, optical, 2D (area monitoring) | | | | |

# systems PSENvip

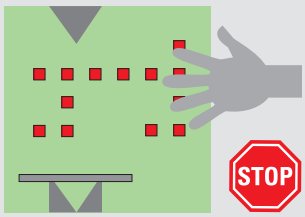


*The optimum solution: Safe, effective press braking with the protection and measuring system PSENvip and the automation system PSS 4000.*

**Your benefits at a glance**

- Highest level of safety for press brakes in accordance with the most current safety standards and in accordance with prEN 12622
- Higher level of operator safety:
  - LED light is safe for eyes
  - New, innovative evaluation of protected field
  - Detection zone certified up to 10 m
- Higher productivity and availability thanks to
  - Innovative optical system
  - Tolerance to vibration, temperature stratification, reflections, external/ diffused light
- User-friendly:
  - Software-supported precision adjustment after tool change
  - User-friendly operation via integrated display
- Low maintenance, as the system has a long service life

*Please contact us for details of the new productive system PSENvip in combination with the automation system PSS 4000.*




*Foreign bodies in the optical field are detected immediately and the press operation is stopped.*

**Flexible application with integrated protection against reaching behind the system**

The protected field enables flexible application in back gauge or box bending mode. One system protects the danger zone on the press from both front and behind.

And special purpose presses can also be equipped with PSENvip, as the system is certified for detection zones up to 10 m.

*Keep up-to-date on camera-based protection and measuring systems PSENvip:*

Webcode 2080

*Online information at www.pilz.com*



# Selection guide – PSENvip

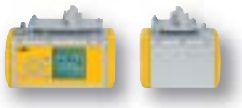
## Camera-based protection and measuring systems PSENvip

### Common features

- Detection zone:
  - Length: 0.1 … 10 m
  - Height: max. 19 mm
  - Width: 38 mm
- Reaction time: 4 ms
- Compliant and approved in accordance with prEN 12622
- For use in applications up to
  - Type 4 of IEC 61496-1/-2
  - PL e of EN ISO 13849-1
  - SIL CL 3 of EN/IEC 61508
  - Cat. 4 of EN 954-1

### Features of bending angle measurement

- Distance between workpiece (plate) and receiver: max. 1.5 m
- Sheet thickness: 2 … 4 mm
- Bending angle: 50 … 160°
- Temperature range (environment): +10 … +40 °C



*PSENvip RL D Set*

| Type | Transmitter |
|---|---|
| **PSENvip RL D Set** | ◆ |
| **PSENvip RL D M Set** | ◆ |
| **PSENvip RL D** | |
| **PSENvip RL D M** | |
| **PSENvip T** | ◆ |

| Receiver | Display | Measuring function | Order number |
|---|---|---|---|
| ◆ | ◆ | | 583 000 [1] |
| ◆ | ◆ | ◆ | 583 002 [1] |
| ◆ | ◆ | | 583 600 |
| ◆ | ◆ | ◆ | 583 610 |
| | | | 583 900 |

[1] *PSENvip (Sets) include: transmitter, receiver, adjustment plates, adjustment templates with magnet and a test piece*

*Technical documentation on camera-based protection and measuring systems PSENvip:*

Webcode 2080

*Accessories, supplementary products and services:*

From page 62

Webcode 0326

*Online information at www.pilz.com*

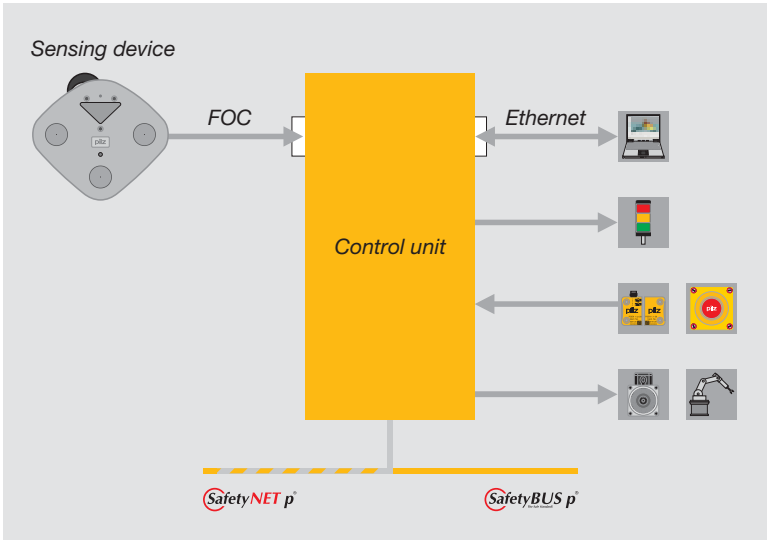


# Safe camera systems

PSEN se Starter Set 1

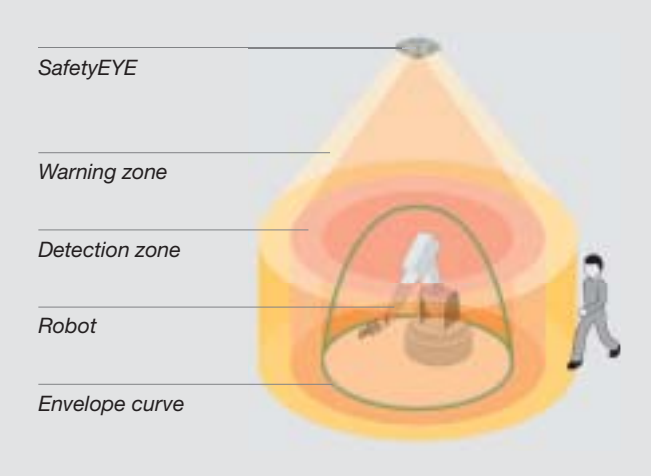
**… three eyes
are better than two**

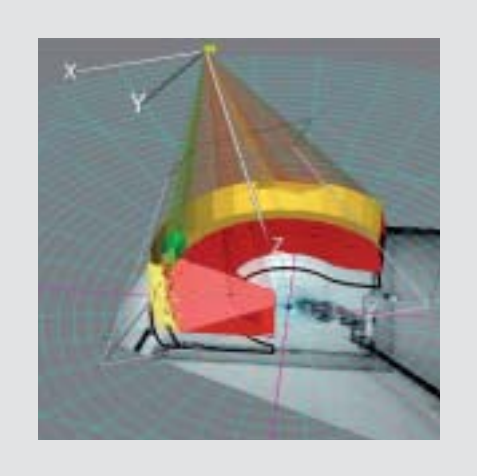
SafetyEYE is a "sight-based" safety technology for zone monitoring. It combines intelligent sensor technology with effective control.




System structure for safe camera systems SafetyEYE.

*Minimise barriers, work ergonomically, maintain flexibility: SafetyEYE enables close co-operation between man and machine.*




*Leading technology: 3D warning and detection zones at the click of a mouse.*

**The innovative 3D solution**

SafetyEYE safe camera systems protect your plant from a bird's eye view, because the sensing device is installed above the zone to be monitored. Where today's applications require a multitude of sensors, a three-dimensional protective cocoon surrounds the danger zone or the object that is to be monitored. This guarantees free access to the work area and means that workstations can be designed with ergonomics in mind.

**Barrier-free protection**

SafetyEYE safe camera systems detect and report objects that encroach into freely defined zones, known as warning zones and detection zones. With SafetyEYE, therefore, it is possible to determine whether there is anyone within the action radius of the hazardous movement (safety) or whether a zone with an increased safety level has been accessed (security).

**Safeguarding the future – economical and flexible**

Another benefit is that the zone being monitored by SafetyEYE can be divided virtually, into almost any number of warning and detection zones. Various actions can be assigned in the event of an object encroaching into these zones: for example, hazardous movements may be slowed down or brought to an emergency stop, acoustic/ optical warning messages may be triggered or an alarm message issued to safety personnel.

**Versatile and flexible for safety concepts with optimum compatibility**

SafetyEYE has a wide range of application options, far exceeding the options available on previous systems. Whether in the automotive or packaging industry, on presses or infeed stations – SafetyEYE opens up new horizons for the widest range of industries and applications.

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

Webcode 1902

*Online information at www.pilz.com*



# Safe camera systems SafetyEYE®

**… for wide-ranging tasks and low costs**

Previously, aligning multiple sensors and commissioning them in conjunction with the control technology was a laborious process.

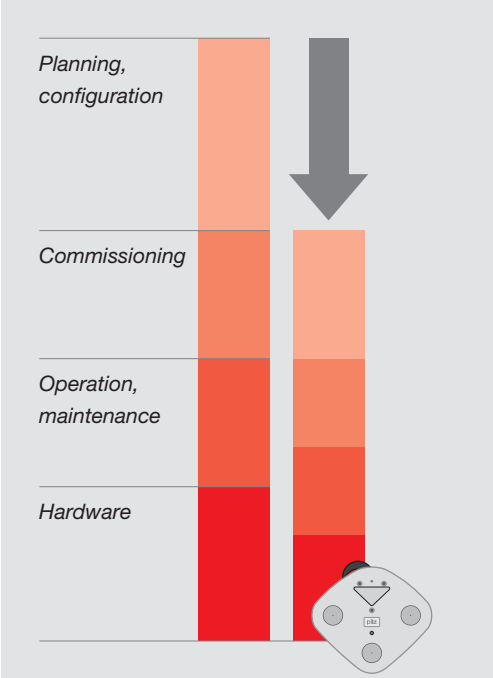
Now, innovative 3D technology and user-friendly software enables even complex applications to be monitored and controlled with one system. This lowers your costs, reduces the number of components to a minimum and cuts expenditure on installation and engineering.

**Keeping an eye on your profitability**

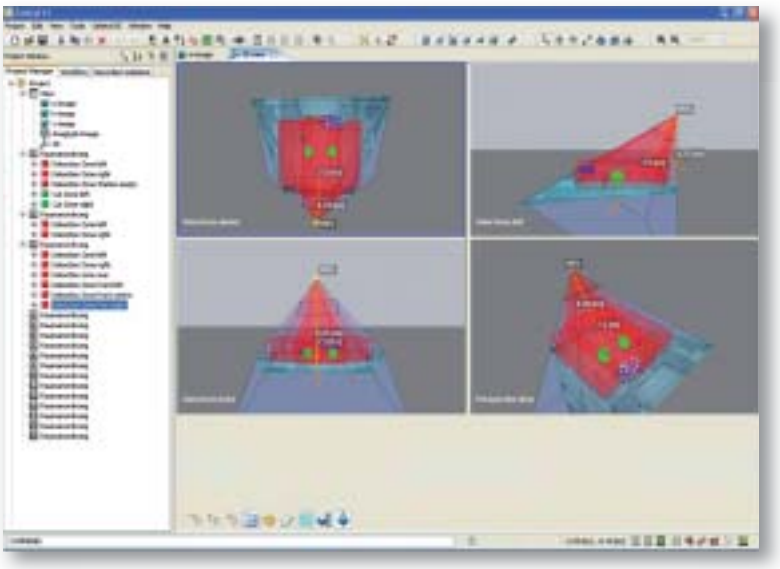
Monitor, control and protect – you can do all this with just one system. Monitor and control several independent warning and detection zones simultaneously with one SafetyEYE. This reduces components to a minimum, saves on installation and material expenses and reduces costs over the whole lifecycle of the plant.

**The future is already in hand**

When processes change in an active high-tech operation, your safety and control equipment instantly changes with it, quickly and economically. Warning and detection zones can be adapted thanks to dynamic, automatic switching, while control functions, operator grips or machine operating ranges can also be varied. That way you can remain flexible; once the zones have been defined they can quickly be adapted at the click of a mouse, using the SafetyEYE Configurator.



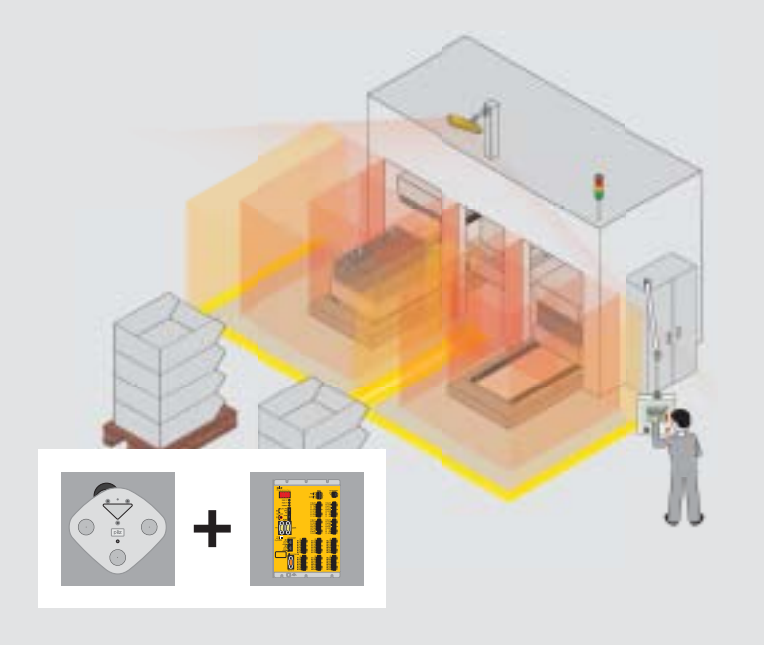

*Your cost saving: Production up and running or are you still wiring?*



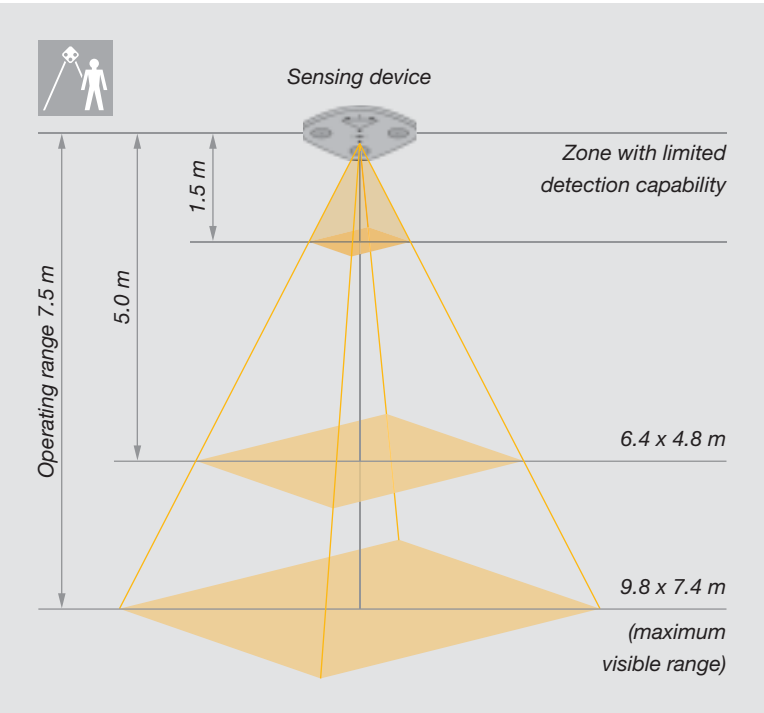
**Detection zones set up rapidly at the click of a mouse**

Virtual warning and detection zones are set up intuitively using the SafetyEYE Configurator. You define the zones, combine them into groups or switch zone arrangements to suit your needs.

Bring your products to market more quickly than with conventional solutions! With SafetyEYE you save time and costs: during planning, configuration, commissioning, operation and maintenance.



*With just one camera system you can monitor and control several work areas independently.*




**Your benefits at a glance**

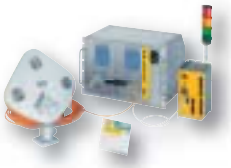
- High level of safety and protection against manipulation
- Economical:
  - Three-dimensional monitoring and control
  - One safe camera system for many functions
  - Highly versatile
  - High level of flexibility when designing or redesigning applications
- High productivity:
  - Ergonomic workstations
  - Efficient work practices
  - Rapid installation and simple commissioning using just a few user-friendly components
  - Simple configuration of 3D warning and detection zones, intuitively at the click of a mouse
  - User-friendly diagnostics, including evidence

*Merlin Award 2009*



# Selection guide – SafetyEYE®

## Safe camera systems SafetyEYE – Starter Set



*PSEN se Starter Set 1*

| Type | Features |
|---|---|
| **PSEN se Starter Set 1** | ▸ Body protection, up to 7.5 m operating range<br>▸ Maximum visible range approx. 72 m²<br>▸ Lighting from 300 lux required, depending on the background<br>▸ Protection types:<br>- Sensing device IP65<br>- Analysis unit IP20<br>▸ Designed in accordance with all relevant norms and standards:<br>- Category 3 of EN 954-1<br>- SIL CL 2 of EN/IEC 61508<br>- PL d of EN ISO 13849-1<br>- In accordance with DIN EN 61496<br>▸ Suitable for worldwide use |

## Sensing device

*PSEN se SU AM2 65*

| Type | Designation |
|---|---|
| **PSEN se SU AM2 65** | Sensing device (2nd generation) |
| **PSEN se PA 250** | Swivel arm for installing the sensing device |

## Analysis unit and programmable control system

*PSEN se AU AM2*

*CompactFlash Karte*

*PSS SB 3075-3 ETH-2 SE*

| | |
|---|---|
| **PSEN se AU AM2** | Analysis unit (2nd generation), 482.6 mm/19" module for rack-mounting |
| **CompactFlash Karte** | 4 GByte memory capacity for storing the project, 2 pieces included in the PSEN se Starter Set |
| **PSEN se AU AM2 Rear Mount** | Mounting bracket for analysis unit (2nd generation) for mounting plate |
| **PSS 3047-3 ETH-2 SE** | Programmable control system with preinstalled user program for SafetyEYE (32 digital inputs, 6 of which are alarm outputs; 12 single-pole outputs, 4 of which are test pulse outputs; 3 dual-pole outputs; Ethernet interfaces) |
| **PSS SB 3075-3 ETH-2 SE** | Programmable control system with preinstalled user program for SafetyEYE (48 digital inputs, 6 of which are alarm outputs; 18 single-pole outputs, 4 of which are test pulse outputs; 9 dual-pole outputs; SafetyBUS p and Ethernet interfaces) |
| **PSS ZKL 3047-3** | Screw connectors (1 set) for PSS 3047-3 ETH-2 SE |
| **PSS ZKL 3075-3** | Screw connectors (1 set) for PSS SB 3075-3 ETH-2 SE |

| Starter Set contains | | Order number |
|---|---|---|
| ▸ PSEN se SU AM2 65<br>▸ PSEN se PA 250<br>▸ PSEN se AU AM2<br>▸ PSEN se AU AM2 Rear Mount<br>▸ PSS 3047-3 ETH-2 SE<br>▸ PSS ZKL 3047-3<br>▸ PSEN se TO Body 140<br>▸ PSEN se Cable FO2C 30 | ▸ PSEN se Cable ETH Patch 1 (2 cables)<br>▸ PSEN se Cable ETH Patch 5<br>▸ CompactFlash card (2 pieces)<br>▸ PIT si3.1 indicator light unit<br>▸ PSEN se SM 6<br>▸ PSEN se SM 10<br>▸ PSEN se RM 6<br>▸ PSEN se RM 10<br>▸ SafetyEYE Assistant and Configurator | 581300 |

| Dimensions (H x W x D) in mm | Protection type [1] | Ambient temperature [2] | Supply voltage | Order number |
|---|---|---|---|---|
| 63.0 x 292.0 x 292.0 | IP65 | 0 … 50 °C | - | 581120 [3] |
| - | - | - | - | 581150 [3] |
| 312.0 x 483.0 x 405.0 | IP54 [5]/IP20 [6] | 0 … 40 °C | 110 … 240 VAC | 581121 [3] |
| - | - | - | - | 310388 [3] [7] |
| 250.0 x 30.0 x 55.0 | - | - | - | 581201 [3] |
| 246.4 x 123.6 x 162.0 | IP20 | 0 … 60 °C | 24 VDC | 300123 [3] |
| 246.4 x 160.2 x 162.0 | IP20 | 0 … 60 °C | 24 VDC | 300253 |
| - | - | - | - | 300900 [3] |
| - | - | - | - | 300910 |

*Please note: This leaflet considers the current development status.*
*Please refer to the Internet for the latest technical details.*

*[1] In accordance with EN 60529 [2] In accordance with EN 60068-2-14 [3] Included in the Starter Set [4] In development*
*[5] Mounting area (e.g. control cabinet) [6] Housing [7] 2 cards included when ordering an analysis unit*

*Technical documentation on safe camera systems SafetyEYE:*

Webcode 1905

*Training – Basic SafetyEYE Course:*

Webcode 4001

*Accessories, supplementary products and services:*

From page 62

Webcode 0326

*Online information at www.pilz.com*



# Compatible with sensor technology: Cont

Our sensors are perfectly compatible with Pilz control technology. You receive first-class components, which you can use individually or combine to form a system.

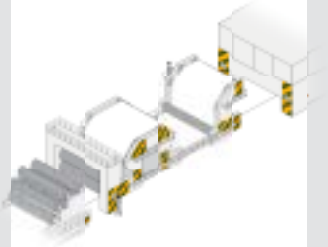
- **PNOZ:** Safety relays for simple plant and machinery with up to 4 safety functions. Safe monitoring of safety gates and light grids, for example.
- **PNOZmulti Mini:** Safety relay with a compact design, which still provides the proven functions of the PNOZmulti as well as an integrated display for diagnostics.
- **PNOZmulti:** Configurable control system which is multi-functional, freely configurable and tailor-made for use in many areas of mechanical engineering.
- **PSS:** Programmable control systems for use on complex machinery or distributed plants, to monitor safety-related functions and/or for complete machine control.
- **PSS 4000:** The automation system for standard and safety is the ideal system for automation solutions in all industries. Reduce engineering effort and costs, now!

*Keep up-to-date on control technology:*

Webcode 0196

*Online information at www.pilz.com*

**Your requirements:**

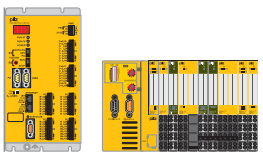


**Our solution:**

*Relays for functional safety PNOZ*

*Configurable safety relays PNOZmulti Mini*

*Configurable control system PNOZmulti*



*Programmable control systems PSS*


*Automation system PSS 4000*

# rol technology and services

**Easy project implementation with Pilz**

Pilz offers a comprehensive
range of services to help implement
sensor technology in your application:

- Safety-related inspection
  - Plant assessment
  - Risk analysis
- Safety concept in accordance with the current standards and directives
- Including safety design
  - Measurement of plant/machine's stopping time
  - Calculation of safety distances
- Including system implementation
  - Preparation/adaptation of circuit diagrams
  - Wiring, assembly, installation
  - System configuration
  - Testing prior to initial commissioning
  - Commissioning
- Safety validation
- CE Services
- Training
- Repeat testing (ESPE inspection)

*Machinery safety services:*

Webcode 0427

*Machinery safety training courses:*

Webcode 0218

*Online information at www.pilz.com*



# Selection guide – Accessories: Cable

## Cable with socket for PSENmag

*PSEN cable*

| Description<br>Type | Features | Quantity |
|---|---|---|
| Cable, M8, 4-pin<br>**Kabel/cable** | Straight, screw-on | 1 |
| | Angled, screw-on | 1 |
| Cable, M8, 8-pin<br>**PSEN cable** | Straight, screw-on | 1 |

## Cable with socket for PSENcode, PSENini, PSENslock

*PSEN cable*

| | | |
|---|---|---|
| Cable, M8, 8-pin<br>**PSEN cable** | Straight, screw-on | 1 |
| Cable, M12, 8-pin<br>**PSEN cable** | Straight, screw-on | 1 |
| | Angled, screw-on | 1 |

## Cable with socket for PSENhinge, PSENopt, PSENvip

*PSEN op cable*

*PSEN op cableset*

*PSEN op connector*

| | | |
|---|---|---|
| Cable, shielded, M12, 4-pin<br>**PSEN op cable** | Straight | 1 |
| | Angled | 1 |
| Cable, shielded, M12, 8-pin<br>**PSEN op cable** | Straight | 1 |
| | Angled | 1 |
| Cable, M12, 4-pin<br>**PSEN op cable** | Straight | 1 |
| | Angled | 1 |
| Cable, M12, 5-pin<br>**PSEN op cable** | Straight | 1 |
| | Angled | 1 |
| Cable, shielded, M12, 5-pin<br>**PSEN op cable** | Cable for cascading,<br>straight | 1 |
| Cable, shielded, M12, 4-pin<br>**PSEN op cableset** | Cable for L-Muting, coupling socket,<br>straight/angled | 1 |
| Cable, shielded, M12, 4-pin<br>**PSEN op cableset** | Y-cable for T-Muting,<br>angled | 1 |
| Plug-in adapter, M12, 5-pin<br>**PSEN op connector** | M12 coupling sockets,<br>for cascade master in standalone mode | 1 |

## Cable with connector for SafetyEYE

*PSEN se Cable FO2C*

| | | |
|---|---|---|
| Cable for data and<br>supply voltage<br>**PSEN se Cable FO2C** | To connect the sensing device<br>to the analysis unit: FOC for data,<br>copper cables for 12 V supply voltage | 1 |
| Ethernet connection cable<br>**PSEN se Cable ETH Patch** | To connect the analysis unit to<br>the programmable control system<br>or configuration PC, shielded | 1 |

| Order number (by length) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **0.5 m** | **0.75 m** | **1 m** | **2 m** | **3 m** | **5 m** | **10 m** | **15 m** | **30 m** | **50 m** | **80 m** |
| - | - | - | 533111 | - | 533121 | 533131 | - | 533141 | - | - |
| - | - | - | 533110 | - | 533120 | 533130 | - | 533140 | - | - |
| - | - | - | 533150 | - | 533151 | 533152 | - | 533154 | - | - |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| - | - | - | 533150 | - | 533151 | 533152 | - | 533154 | - | - |
| - | - | - | - | 540319 | 540320 | 540321 | - | 540326 | - | - |
| - | - | - | - | 540322 | 540323 | 540324 | - | 540325 | - | - |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| - | - | - | - | 630303 | 630304 | 630305 | - | 630309 | - | - |
| - | - | - | - | 630306 | 630307 | 630308 | - | 630319 | - | - |
| - | - | - | - | 630313 | 630314 | 630315 | - | 630328 | - | - |
| - | - | - | - | 630316 | 630317 | 630318 | - | 630329 | - | - |
| - | - | - | - | 630300 | 630301 | 630302 | - | 630296 | - | - |
| - | - | - | - | 630341 | 630342 | 630343 | - | 630344 | - | - |
| - | - | - | - | 630310 | 630311 | 630312 | - | 630297 | - | - |
| - | - | - | - | 630347 | 630348 | 630349 | - | 630350 | - | - |
| 630280 | - | 630281 | - | - | - | - | - | - | - | - |
| - | 630282 | - | - | - | - | - | - | - | - | - |
| 630295 | | | | | | | | | | |
| 630285 | | | | | | | | | | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| - | - | - | - | - | - | - | 581122 | 581123 [1] | 581124 | 581125 |
| - | - | 581112 [2] | - | - | 581111 [1] | - | - | - | - | - |

[1] *1 cable included in the SafetyEYE Starter Set (2nd generation)*

[2] *2 cables included in the SafetyEYE Starter Set (2nd generation)*



# Selection guide – Accessories for series co

## Accessories for series connection for PSENini, PSENcode, PSENslock, PSENsgate

*PSEN Y junction*

*PDP67 F 4 code*

| Description<br>Type | Features | Quantity | Order number |
|---|---|---|---|
| Diagnostic connector<br>**PSEN T junction M12** | M12, 8-pin | 1 | 540331 |
| Cable separator<br>**PSEN Y junction M8-M12/M12** | M8, 8-pin | 1 | 540327 |
| **PSEN Y junction M12-M12/M12** | M12, 8-pin | 1 | 540328 |
| Connection cable<br>**PSENcable M12-8sf M12-8sm** | M12, 8-pin | 1 | 2 m .....540340<br>5 m .....540341<br>10 m .....540342<br>20 m .....540343<br>30 m .....540344 |
| Multiple interface PDP67, protection type: IP67 | Series connection up to PL e of EN ISO 13849-1, SIL CL 3 of EN/IEC 62061 and Cat. 4 of EN 954-1 | | |
| **PDP67 F 8DI ION** | Sensor junction box for decentralised periphery PNOZmulti | 1 | 773600 |
| **PDP67 F 4 code** | Passive junction for PSENcode | 1 | 773603 |

## Accessories for series connection for PSENmag, PSENmech, PSENhinge, PSENrope

*PDP67 F 8DI ION*

| | | | |
|---|---|---|---|
| Multiple interface PDP67, protection type: IP67 | Series connection up to PL e of EN ISO 13849-1, SIL CL 3 of EN/IEC 62061 and Cat. 4 of EN 954-1 | | |
| **PDP67 F 8DI ION** | Sensor junction box for decentralised periphery PNOZmulti | 1 | 773600 |
| Multiple interface for PSENmag (PSEN 1 series)<br>**PSEN ix1** | Can be used for connection to:<br>▸ Safety relays PNOZsigma, PNOZpower, PNOZ X<br>▸ Configurable control systems PNOZmulti<br>▸ Programmable control systems PSS | 1 | 535120 |
| Multiple interface for PSENmag (PSEN 2 series)<br>**PSEN i1** | Can be used for connection to:<br>▸ Safety relays PNOZelog<br>▸ Configurable control systems PNOZmulti<br>▸ Programmable control systems PSS | 1 | 535110 |

## Installation accessories for PSENmech, PSENmag, PSENcode, PSENslock

*PSEN screw*

| Description<br>Type | Features | Quantity | Order number |
|---|---|---|---|
| One-way screw<br>to secure the actuator | ▸ Stainless steel<br>▸ Drive: One-way slot (safety screw) | | |
| **PSEN screw M4x16** | ▸ M4, 16 mm<br>▸ Suitable for PSEN 1.x, PSEN 2.x, PSEN me1x/1AS and PSEN me4x | 10 | 540 310 |
| **PSEN screw M5x10** | ▸ M5, 10 mm<br>▸ Suitable for PSEN cs1.x and PSEN cs2.x | 10 | 540 311 |
| **PSEN screw M5x20** | ▸ M5, 20 mm<br>▸ Suitable for PSEN cs1.x, PSEN cs2.x, PSEN me1x/1AR, PSEN me2/x, PSEN me3/x and PSEN sl-x | 10 | 540 312 |

## Installation accessories for PSENmag (PSEN 1.1 and PSEN 2.1)

*PSEN reverse spacer*

| | | | |
|---|---|---|---|
| Spacer<br>**PSEN spacer** | Plastic | 10 | 534310 |
| Mounting bracket<br>**PSEN bracket** | Aluminium | 1 | 532110 |
| Reverse spacer<br>**PSEN reverse spacer** | Plastic | 2 | 534320 |

## Installation accessories for PSENhinge

| | | | |
|---|---|---|---|
| Blank hinge<br>**PSEN hs1 hinge** | Stainless steel | 1 | 570280 |
| Change kit<br>**PSEN hs kit1** | To re-adjust the switching point | 1 | 570281 |

## Installation accessories for PSENrope

| | | | |
|---|---|---|---|
| Block rope pulley<br>**PSEN rs pulley flex** | Rotatable | 1 | 570313 |
| Rope for rope pull switch<br>**PSEN rs rope d3/d4** | ▸ Rope diameter: 3 mm<br>▸ Insulation diameter: 4 mm<br>▸ PVC-coated, red | 1 | 50 m .....570314<br>100 m .....570315 |
| Guide roller<br>**PSEN rs pulley 75** | ø 75 mm | 1 | 570312 |
| Cage clamp<br>**PSEN rs spring** | Steel, max. spring force<br>to tension the rope | | |
| | 175 N | 1 | 570310 |
| | 300 N | 1 | 570311 |

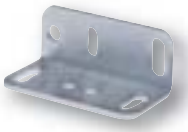


# Selection guide – Installation accessories

## Installation accessories for PSENopt

*PSEN iop1*

*PSEN op Laser pointer*



*PSEN op Bracket*

*PSEN op Bracket kit*

*PSEN op Mirror*

| Description<br>Type | Features | Quantity | Order number |
|---|---|---|---|
| Junction box<br>**PSEN iop1** | Suitable for PSEN op4B-T/-L/-S | 1 | 630370 |
| Alignment guide<br>**PSEN op Laser pointer** | Laser protection class 2<br>in accordance with EN 60825-1 | 1 | 630340 |
| Floor bracket<br>**PSEN op Stand** | ▸ Dimensions (W x D): 240 x 240 mm<br>▸ Profile: 30 x 30 mm | 1 | 1,000 mm ..630330<br>1,200 mm ..630331 |
| | ▸ Dimensions (W x D): 240 x 240 mm<br>▸ Profile: 45 x 45 mm | 1 | 1,500 mm ..630332<br>1,800 mm ..630333 |
| Mounting bracket<br>**PSEN 2S/4S bracket** | Suitable for PSEN op2S/4S | 2 | 630712 |
| **PSEN op2H bracket kit** | Suitable for PSEN op2H | 12 | 630713 |
| **PSEN op2H bracket kit adjustable** | Suitable for PSEN op2H, adjustable | 4 | 630714 |
| **PSEN op Bracket** | Suitable for muting sensors | 1 | 630324 |
| **PSEN op Bracket kit** | ▸ Suitable for all PSENopt except PSEN op2H<br>▸ Profile: 30 x 30 mm | 4 | 630325 [1] |
| **PSEN op bracket turnable (kit)** | ▸ Suitable for PSEN op…/1, rotatable and adjustable<br>▸ Profile: 30 x 30 mm | 4 | 630772 [2] |
| **PSEN op Bracket kit adjustable** | ▸ Adjustable<br>▸ Profile: 30 x 30 mm | 4 | 630326 |
| **PSEN op Bracket kit antivibration** | ▸ Vibration-resistant<br>▸ Profile: 30 x 30 mm | 4 | 630327 |
| Deviating mirror<br>**PSEN 2S/4S mirror** | Suitable for light beam devices PSEN op2S/4S | 1 | 630711 |
| **PSEN op Mirror** | ▸ Suitable for PSEN op2 and PSEN op4<br>▸ Dimensions (W x D): 124 x 6 mm | 1 | 550 mm ...630335<br>700 mm ...630336<br>900 mm ...630337<br>1,000 mm ..630338<br>1,270 mm ..630339<br>1,600 mm ..630360<br>1,800 mm ..630361 |

[1] *Included with the PSENopt*

[2] *Included with the PSEN op…/1*

## Installation accessories for PSENslock

| Description<br>Type | Features | Quantity | Order number |
|---|---|---|---|
| Mounting bracket<br>**PSEN sl bracket sliding door** | For sliding gates | 2 | 570551 |
| **PSEN sl bracket swing door** | For swing gates | 1 | 570550 |

## Installation accessories for PSENvip

*PSENvip MS*

*PSENvip AT mag*

| | | | |
|---|---|---|---|
| Adapter plate<br>**PSENvip MB** | To mount the PSENvip AP on to any bracket, with slot | 2 | 583205 |
| Retaining brackets<br>**PSENvip MS** | Retaining brackets (set) for installation | 2 | 583206 |
| Adjustment plates<br>**PSENvip AP** | For PSENvip, transmitter and receiver | 2 | 583202 [3] |
| Adjustment templates<br>**PSENvip AT mag** | With magnet to align PSENvip on a first-time installation | 2 | 583203 [3] |
| **PSENvip AT mech** | For mechanical installation in the tool holder on a first-time installation | 2 | 583204 |

*[3] Included with the PSENvip (Set)*

## Installation accessories for SafetyEYE

*PSEN se PA 250*

*CompactFlash Karte*

| | | | |
|---|---|---|---|
| Swivel arm<br>**PSEN se PA 250** | For installing the sensing device | 1 | 581150 [4] |
| Mounting bracket<br>**PSEN se AU AM2 Rear Mount** | ▸ Suitable for mounting plate for the analysis unit (2nd generation)<br>▸ Dimensions (H x W x D): 250 x 30 x 55 mm | 1 | 581201 [4] |
| CompactFlash card<br>**CompactFlash Karte** | For storing the project, 4 GByte memory capacity | 1 | 310388 [5] [6] |
| Screw connector | Plug-in screw terminals (1 set) | | |
| **PSS ZKL 3047-3** | For PSS 3047-3 ETH-2 SE | 1 | 300900 [4] |
| **PSS ZKL 3075-3** | For PSS SB 3075-3 ETH-2 SE | 1 | 300910 |

*[4] Included with the SafetyEYE Starter Set*

*[5] 2 cards included with the SafetyEYE Starter Set*

*[6] 2 cards included when ordering an analysis unit*



# Selection guide – Commissioning accesso

## Commissioning accessories, live operation of PSENopt

*PSEN op Testpiece*

| Description<br>Type | Features | Quantity | Order number |
|---|---|---|---|
| Test rod | For regular function test | | |
| **PSEN op Testpiece F 14 mm** | Finger protection, ø 14 mm | 2 | 630345 |
| **PSEN op Testpiece H 30 mm** | Hand protection, ø 30 mm | 3 | 630346 |

## Commissioning accessories, live operation of PSENvip

*PSENvip TP*

| | | | |
|---|---|---|---|
| Test piece<br>**PSENvip TP** | For regular function test, finger protection | 1 | 583200 [1] |

[1] *Included with the PSENvip (Set)*

## Commissioning accessories, live operation of SafetyEYE

*PSEN se SM 10/*
*PSEN se RM 10*

*SafetyEYE*
*Configurator*

*PIT si3.1*

| | | | |
|---|---|---|---|
| Setup markers | Depends on the distance between sensing device and user plane | | |
| **PSEN se SM 6** | 1 … 6 m | 5 | 581160 [2] |
| **PSEN se SM 10** | 4 … 10 m | 5 | 581161 [2] |
| Reference markers | Depends on the distance between sensing device and user plane | | |
| **PSEN se RM 6** | 1 … 5 m | 6 | 581170 [2] |
| **PSEN se RM 10** | 4 … 9 m | 6 | 581171 [2] |
| Software<br>**SafetyEYE Assistant and Configurator, basic licence** | Basic licence for the SafetyEYE Assistant and Configurator | 1 | 581250B [2] |
| **SafetyEYE Assistant and Configurator CD** | CD containing the configuration software for SafetyEYE Assistant and Configurator | 1 | 581250D [2] |
| **SafetyEYE Assistant and Configurator CD, documentation** | CD containing configuration software for SafetyEYE Assistant and Configurator, plus SafetyEYE documentation | 1 | 581250 |
| **SafetyEYE Assistant and Configurator, copy licence** | Copy licence for the SafetyEYE Assistant and Configurator | 1 | 581250K |
| Indicator light unit<br>**PIT si3.1 indicator light unit** | ▸ Red, amber, green<br>▸ Supply voltage: 24 VDC | 1 | 581190 [2] |
| Test piece<br>**PSEN se TO Body 140** | For regular function test, body protection, ø 140 mm | 1 | 581182 [2] |

[2] *Included with the SafetyEYE Starter Set*

# ries, live operation and muting

## Muting accessories for PSENopt and PMUT

*PIT si 1.1*

*PSEN op1.1*

| Description<br>Type | Features | Quantity | Order number |
|---|---|---|---|
| Signal lamp for muting mode | ▸ Operating range: 0.1 … 3 m<br>▸ Protection type: IP65<br>▸ Supply voltage: 24 VDC | | |
| **PIT si 1.1** | ▸ Unmonitored in accordance with EN/IEC 61496<br>▸ Incl. incandescent lamp, mounting bracket and 2 screws | 1 | 620010 |
| **PIT si 1.2** | ▸ Monitored in accordance with EN/IEC 61496 and VDE 0113-201<br>▸ 2 semiconductor outputs to monitor the function of the filament<br>▸ TÜV approval | 1 | 620020 |
| **PIT si 2.1** | ▸ Monitored in accordance with EN/IEC 61496 and VDE 0113-201<br>▸ TÜV approval<br>▸ Incl. LED, mounting bracket and 2 screws<br>▸ Service life up to 50,000 hours | 1 | 620015 |
| Muting sensors | ▸ Output: PNP, N/O and N/C<br>▸ Supply voltage: 10 … 30 VDC<br>▸ Connection: connector, M12, 4-pin | | |
| **PSEN op1.2 Emitter M12** | Transmitter:<br>▸ Suitable for PSEN op4, PSEN op2B<br>▸ Operating range: 0 … 20 m | 1 | 630322 |
| **PSEN op1.1 Receiver pnp no/nc M12** | Receiver:<br>▸ Suitable for PSEN op4, PSEN op2B<br>▸ Operating range: 0 … 20 m | 1 | 630321 |
| **PSEN op1.3 Reflex pnp no/nc M12** | Reflex:<br>▸ Suitable for PSEN op2B, PSEN op4, PSEN opSB<br>▸ With prism reflector<br>▸ Operating range: 0.1 … 6 m | 1 | 630320 |
| **PSEN op Reflector** | Reflector:<br>▸ Suitable for PSEN op2B, PSEN op4, PSEN opSB<br>▸ With prism reflector<br>▸ Operating range: 0.1 … 6 m | 1 | 630323 |

## Muting accessories for PIT

*PITsign 7W*

| | | | |
|---|---|---|---|
| Incandescent lamp<br>**PITsign 7W** | Replacement lamp<br>(PIT si 1.1 and PIT si 1.2) | 1 | 620100 |

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