Sensor technology PSEN®

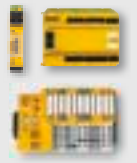
Position monitoring devices
Safety switches
Safety gate systems
Optoelectronic protective devices
Safe camera systems

Your safe solution: Sensor technology plus control system.

the spirit of safety

Business activities

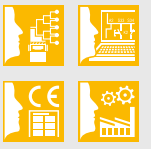
Components

Sensor technology	▸ Position monitoring devices ▸ Safety switches ▸ Safety gate systems ▸ Optoelectronic protective devices ▸ Safe camera systems	
Control technology	▸ Line inspection devices ▸ Relays for electrical safety ▸ Relays for functional safety ▸ Configurable control systems ▸ Compact programmable control systems ▸ Modmodular programmable control systems ▸ Decentralised periphery	
Networks	▸ Safe fieldbus systems ▸ Ethernet systems ▸ Wireless systems	SafetyBUS p SafetyNET p induraNET p
Drive technology	▸ Motion control systems ▸ Servo amplifiers ▸ Motors ▸ Gears	
Operator and visualisation systems	▸ Control and signal devices ▸ Operator terminals	
Software	▸ System software and tools ▸ Application software	

Systems

Automation system PSS 4000	▸ Control systems ▸ Real-time Ethernet ▸ Software platform	 SafetyNET p PAS 4000

Services

Consulting and engineering	▸ Risk Assessment ▸ Safety Concept ▸ Safety Design ▸ System Implementation ▸ Safety Validation	▸ CE Marking ▸ International Compliance Services ▸ Plant Assessment ▸ Inspection of ESPE	
Training	▸ Seminars ▸ Courses		

Support

Technical help round the clock!

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

Americas
- Brazil
  +55 11 8245-8267
- Mexico
  +52 55 5572 1300
- USA (toll-free)
  +1 877-PILZUSA (745-9872)

Asia
- China
  +86 21 60880878-216
- Japan
  +81 45 471-2281
- Korea
  +82 2 2263 9540

Australia
- Australia
  +61 3 95446300

Europe
- Austria
  +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
- Scandinavia
  +45 74436332
- Spain
  +34 938497433
- Switzerland
  +41 62 88979-30
- The Netherlands
  +31 347 320477
- Turkey
  +90 216 5775552

You can reach our international hotline on:

+49 711 3409-444
support@pilz.com

Pilz GmbH & Co. KG
Felix-Wankel-Straße 2
73760 Ostfildern, Germany

Telephone: +49 711 3409-0
Telefax: +49 711 3409-133
E-Mail: pilz.gmbh@pilz.de
Internet: www.pilz.com

Automation technology from Pilz

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 26 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 1 400 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.

Scan the QR code with your smartphone to find out more about Pilz.

Safe sensor technology PSEN®

Pilz sensors PSEN guarantee that machinery and complex plants can be used efficiently while still complying with standards intended to protect man and machine. The versatile portfolio means that solutions can be individually tailored to each requirement: from position monitoring to three-dimensional zone monitoring. We work on new, overall solutions and complete systems for your application. That way we continue to develop our own range – and adapt it to meet your requirements.

Pilz stands beside you as a competent partner in matters far beyond sensor technology. Because as well as safe control solutions, including in combination with sensor technology PSEN, we also offer classic standard products to a high level of quality. We also provide support through a wide range of services, helping you to realise your projects and implement them within your application.

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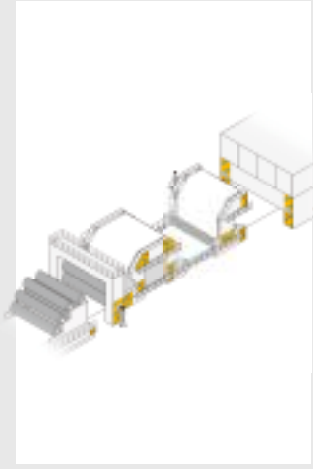
The safe, complete solution – Sensor and

Your requirements:

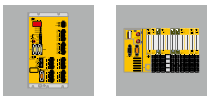


Our example solutions:

Configurable safety relays PNOZmulti Mini and safety gate system PSENslock

Control systems PNOZmulti and safety switches PSENmag

Safety relays PNOZsigma and rope pull switches PSENrope



Programmable control systems PSS and PSSuniversal

Automation system PSS 4000

Easy project implementation with Pilz services:

- Risk Assessment
- Hazard assessment in accordance with industrial safety regulations
- Plant Assessment

- Safety Concept based on the Risk Assessment
- Safety Design, including
  - Measurement of stopping time
  - Full implementation of the protective measures defined in the Safety Concept

- System Implementation, including
  - Preparation of circuit diagrams, revision
  - Wiring, assembly, installation
  - System configuration
  - Testing prior to initial commissioning
  - Commissioning

- Validation, including verification of the safety function (e.g. with the PAScal calculation tool)

- CE services
  - Conformity assessment procedure
  - Pilz as an authorised representative in accordance with the MD or in an advisory function

- Product-neutral seminars (CMSE[1])

- Repeat testing (ESPE Inspection) in accordance with DAkkS

[1] *Certified Machinery Safety Expert*

control technology from Pilz

As market and technology leader, Pilz offers a universal portfolio of products and solutions suitable for cross-sector, international application. Whether you need safety or standard, machine or plant, a single product or a total solution: With Pilz you will definitely find a solution for your automation function.

Are you looking for a flexible solution? Used in conjunction with Pilz control technology, sensor technology PSEN provides a complete, economical and co-ordinated solution that's approved and safe.

In our example soutions, sensor technology PSEN is combined with:

- **PNOZ:** Safety relays for simple plant and machinery with up to three safety functions. Safe monitoring of E-STOPs, safety gates and light curtains/light grids, for example. The product range **PNOZsigma** combines minimum width from 12.5 mm with maximum functionality.
- **PNOZmulti Mini:** Compact, configurable safety relays, 45 mm width, with integrated display for simple diagnostics.
- **PNOZmulti:** Control system, configurable with the software PNOZmulti Configurator, designed for use from three safety functions.
- **PSS:** Programmable control system to monitor safety-related functions and/or for complete machine control. PSSuniversal is part of the Pilz decentralised periphery and offers solutions for standard and safety.
- **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.
- **Machinery safety services:** Pilz can provide professional support in all phases of the machine's lifecycle. From risk assessment and production of safety concepts through to implementation and validation. We can help guide you through CE certification and keep you fully informed on all the issues in seminars and training courses.

The safe, complete solution

In addition to the extensive sensor technology portfolio you'll find that Pilz also provides overall solutions in the area of control technology, drive technology, operator and visualisation systems, plus software. Enjoy the benefits of co-ordinated, automation solutions. That way you can save time and money in the implementation of individual components. The focus is always on the protection of man and machine, in compliance with the standards.

Our services at a glance:

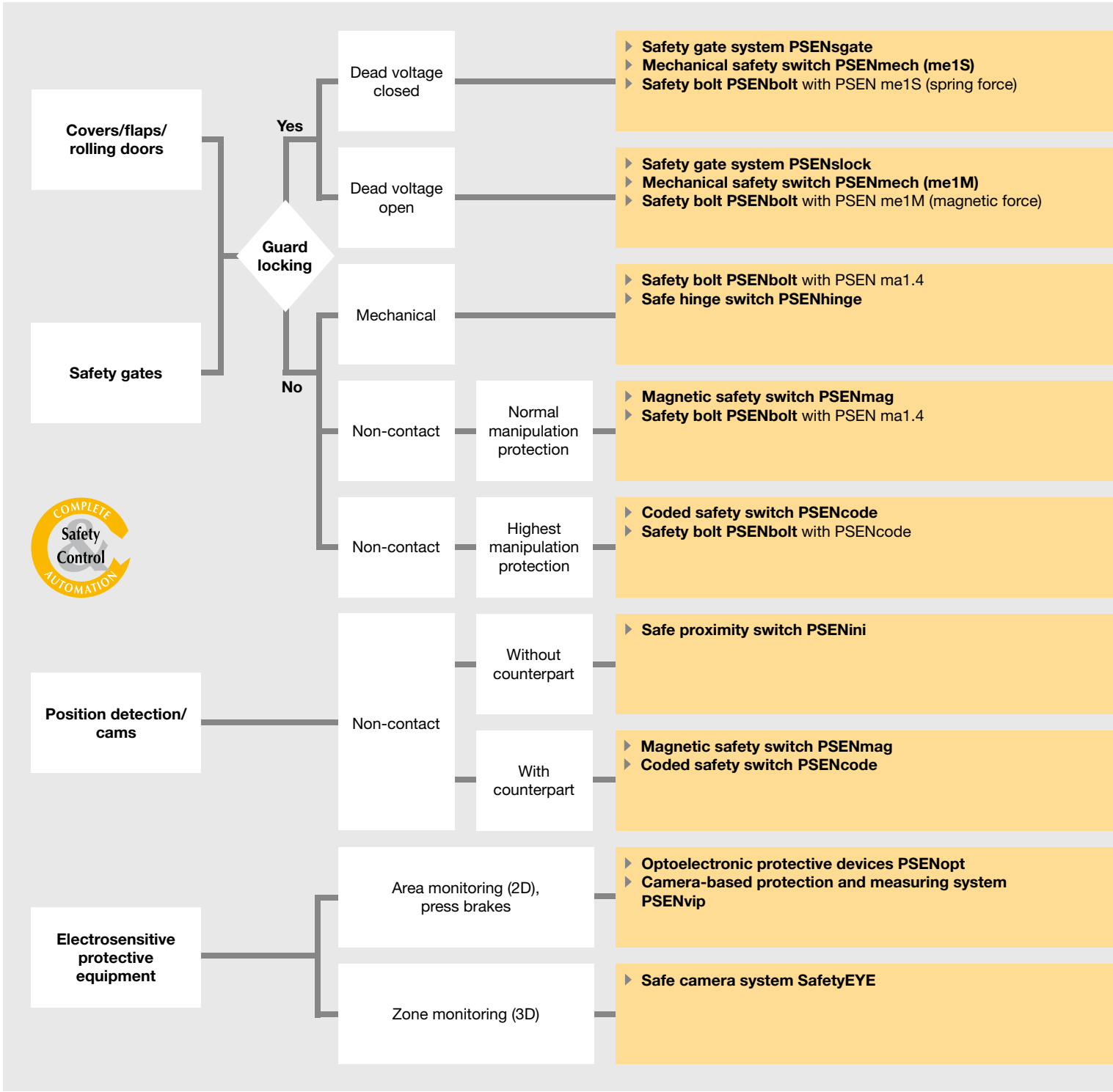
Webcode 0427

The whole range of business activities at a glance:

Webcode 5171

Online information at www.pilz.com

For every requirement – Safe sensors PSEN®



Selection guide – Sensor technology PSEN

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From page 70

Pilz offers a wide range of safe sensors that conform to international standards and have been tested and approved by certification bodies. As the Pilz sensors were developed, great value was placed on performance, robustness, quality and easy of operation.

Free choice for your application

Safe sensors are suitable for use on covers, flaps, rolling doors, safety gates, cams, electrosensitive protective equipment and for position detection. In the overview you'll find the right sensors to suit your safety requirement. For example, if your safety gate needs a sensor with no guard locking function, with non-contact operation and the highest level of manipulation protection, PSENcode is the right choice.

Position monitoring

Position monitoring with counterpart

E-STOP pushbutton

Light beam device

Safety gate

Finger protection

Three-dimensional zone monitoring

The right technology

The high variability of safe sensors PSEN can be seen in the different technologies: whether you need a mechanical, magnetic, RFID, optical or camera-based system – with its expertise and experience, Pilz has implemented every technology to its optimum.

Protection for your investment

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

Keep up-to-date on sensor technology PSEN:

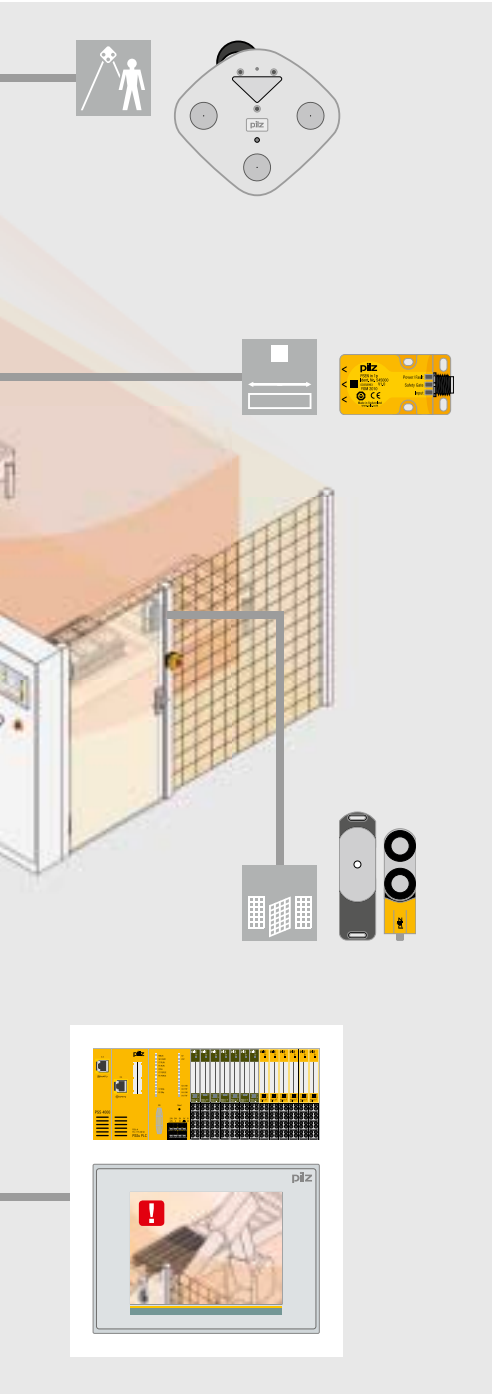
Webcode 5172

Online information at www.pilz.com

Versatile product portfolio – Safe sensor

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

technology PSEN®



While high plant efficiency is a requirement in an industrial environment, it's important not to neglect the protection of man, machine and the environment: from commissioning to high availability during operation. Pilz sensors PSEN provide a safe, flexible solution:

High compatibility

Sensors from the various product ranges are compatible and can be connected in series. That reduces the inputs during installation, as well as saving time and costs during configuration and commissioning.

For any budget

As a ready-to-install system, potential engineering savings are not the only benefit on offer from safe sensors PSEN. Many sensors are equipped with different operating principles, enabling the solution to be geared towards your requirement.

Quality with safety

The product design has been developed individually for each PSEN product range, both technically and functionally; it's been attractively engineered, with a safe, sophisticated concept. Pilz is certified to EN ISO 9001 and our safety products have been developed for use in accordance with EN ISO 13849-1 and EN/IEC 62061.

Based on the different features and functionalities, our sensors can be divided into various product ranges. The graphic on this double page will help you choose. If you have specific requirements, we have the right products and solutions:

- Position monitoring devices – from page 10
- Safety switches – from page 16
- Safety gate systems – from page 36
- Optoelectronic protective devices – from page 46
- Safe camera systems – from page 66

Keep up-to-date on:

- *Sensor technology PSEN*

Webcode 5172

- *Control technology*

Page 4-5

Webcode 5213

Online information at www.pilz.com

Safe proximity switch PSENini

IP67

PSEN in1p

Safe monitoring without actuators

The safe proximity switch PSENini detects the approach of metallic objects without the use of contacts. It supplies the necessary safe signals via positions and end limits. PSENini can also generate the pulse for counting tasks or for detecting rotational movements.

Applications for PSENini:

- Cams
- Rolling doors
- Pulse generator for counting tasks or rotational movements

High productivity and long service life

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

The safe proximity switch is also insensitive to vibration, dust and humidity.

High savings potential in series

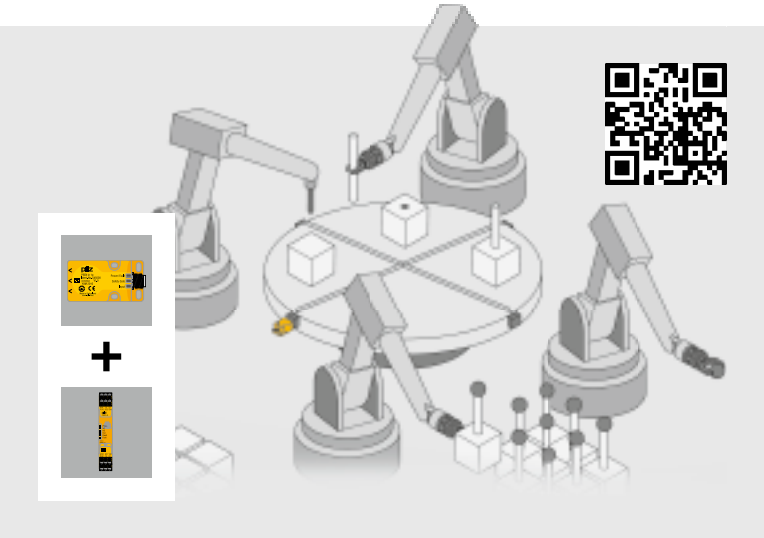
Take advantage of the high savings potential of PSENini, even with the very highest safety requirements, because PSENini can also be connected in series with safety switches PSENcode and safety gate systems PSENslock and PSENsgate.

Photo: KUKA Roboter GmbH

Type code for PSENini

PSEN in1p

Product area **P**ilz **SEN**sors	**Series**	**Connection type**
Product range **in – PSENini**	**1 Series 1**	**p Connector, M12, 8-pin (series connection integrated within sensor)** n Connector, M12, 5-pin
Operation Non-contact, inductive		



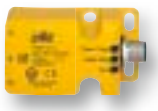
Components for your safe solution	Order number
Sensor: PSEN in1p	545 000
Connection: PSEN cable, M12, 8-pin, 5 m	540 320
Evaluation device: PNOZ s3	751 103

The optimum solution: position of the turntable is monitored using the proximity switch PSENini and safety relay PNOZsigma.

Your benefits at a glance

- Investment protection: can be combined directly with a wide range of evaluation devices
- User-friendly: Rapid diagnostics via LED
- Economical and flexible: series connection means less wiring and fewer inputs
- Highly versatile:
  - With strict hygiene regulations IP67
  - Heavy soiling
  - Insensitive to shock
- Long product service life due to wear-free function

Selection guide – Safe proximity switch PSENini



PSEN in1p

Type	Connection type	Series connection in combination with PSENini, PSENslock, PSENcode[1)]	Order number
PSEN in1p	Connector, M12, 8-pin	▸ Y junction (cable separator) ▸ PDP67 F 4 code	545 000
PSEN in1n	Connector, M12, 5-pin	▸ PDP67 F 8DI ION	545 003

[1)] Up to PL e of EN ISO 13849-1, SIL CL 3 of EN/IEC 62061 and Cat. 4 of EN 954-1

Common features

- Typical operating distance (steel): 15 mm
- Diagnostic interface: 3 LEDs (status of actuator, status of inputs, supply voltage/error)
- Directions of actuation: 1
- Approach directions: 1
- Outputs: 2 safety outputs and 1 signal output
- Inputs (PSEN in1p): 2 safety inputs

Further information and technical documentation on the safe proximity switch PSENini:

Webcode 6256

Cable and other accessories:

From page 76

Webcode 5171

Online information at www.pilz.com

Safe rope pull switch PSENrope

IP67

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, the safe rope pull switch PSENrope is a proven, reliable solution.

PSENrope switches off functional processes via manual operation in the case of danger. It offers maximum safety: the emergency stop function can be triggered at any point along the rope.

Optimum safety solution is as simple as that

PSENrope is flexible to use, easy to install and simple to operate. Whether it's a first-time installation or upgrade: the safe rope pull switch PSENrope simplifies installation with its sophisticated technical details.

Durable – even under extreme conditions

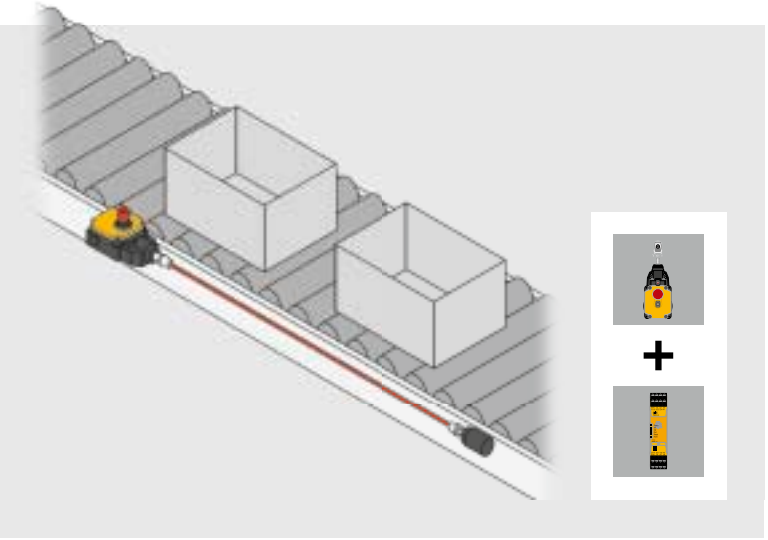
As the operating range of rope pull switches is limited only by the length of the rope, even large plants can be safeguarded using PSENrope.

Due to its rugged finish, PSENrope is reliable even under extreme environmental conditions.

Type code for PSENrope

PSEN rs1.0-300

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



Components for your safe solution	Order number
Sensor: PSEN rs2.0-175	570303
Connection: Cable, depending on function, e.g. 8 x 0.5 mm²	-
Evaluation device: PNOZ s4	751104

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:
  - Manipulation-proof
  - Wiring space physically separate from mechanics
  - Dual function: E-STOP and pull-to-release in one
- 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 switch 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

★ *Recommended type*

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
- Integrated E-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 the safe rope pull switch PSENrope:

Webcode 6568

Cable and other accessories:

From page 76

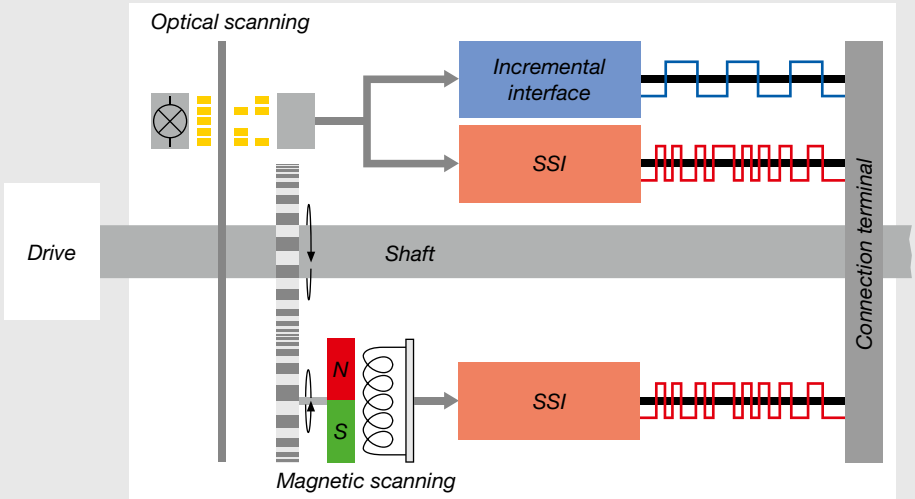
Webcode 5171

Online information at www.pilz.com

Rotary encoder PSENenco

PSEN enc m1 eCAM

PSEN enc m2 eCAM



Redundant, dual-channel rotary encoder.

Safe position, safe speed

The rotary encoders PSENenco are used to determine position and speed. The rotary encoder available in the first expansion phase is an absolute encoder, which is used in the automation system PSS 4000. It supplies diverse, absolute position values, which are verified in the software block. The rotary encoder has a magnetic and an optical measuring system and thus combines two units in one.

Standard rotary encoder, but safe

The rotary encoder PSENenco is a standard encoder – but through the combination of the control system PSSuniversal PLC, the rotary encoder and software blocks, the system reaches SIL CL 3 and PL e.

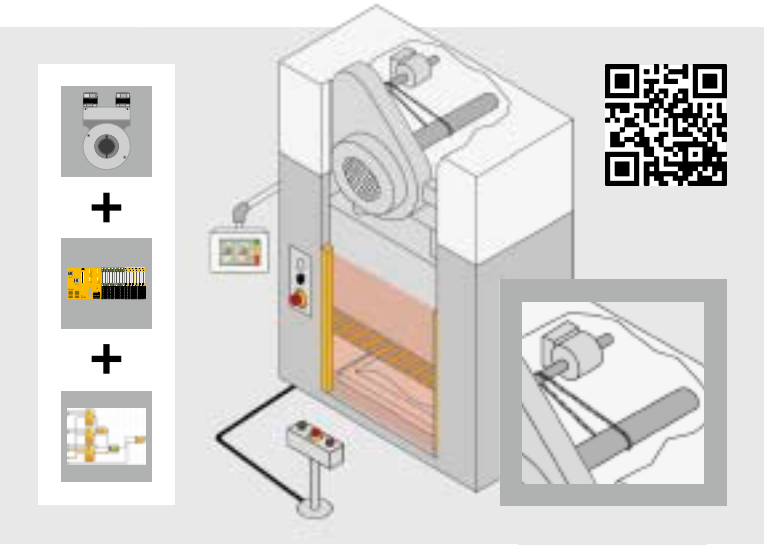
Application of PSENenco

The rotary encoder PSENenco can be used in the mechanical press sector, for example. The Pilz “safe electronic rotary cam arrangement” solution completely replaces conventional mechanical rotary cam arrangements. Further application areas can be found anywhere that safe position detection is required.

Type code for PSENenco

PSEN enc m1 eCAM

Product area Pilz **SEN**sors	Rotary encoder feature	Series	Design
Product range **enc – PSENenco**	**m** **Multi-turn**	**1** **Series 1** 2 Series 2	**eCAM** **Electronic rotary cam arrangement**
Operation Magnetic and optical			



Components for your safe solution	Order number
Sensor: PSEN enc m1 eCAM	544 021
Connection: Signal cable, min. 0.25 mm², shielded, stranded pair	-
Evaluation device: PSSu PLC1 FS SN SD	312 070

The optimum solution: rotary encoder, control system and software = safe electronic rotary cam arrangement.

Your benefits at a glance

- Safe evaluation of speed and position
- The safe monitoring function is transferred to the user software
- High flexibility when monitoring limit values due to dynamic limit value monitoring in the user program
- Mechanical rotary cam arrangement is replaced by the safe electronic rotary cam arrangement PSS 4000 incl. PSENenco

Selection guide – Rotary encoder PSENenco

PSEN enc m1 eCAM

PSEN enc m2 eCAM

Type	Function	Rotary encoder feature	Order number
PSEN enc m1 eCAM	Absolute encoder	Multi-turn, hollow shaft	544 021
PSEN enc m2 eCAM	Absolute encoder	Multi-turn, solid shaft	544 022

Common features

- Two encoders in one housing
- Diverse, 2-channel (1 x optical, 1 x magnetic)
- 2 SSI interfaces
- SIL CL 3 and PL e within the automation system PSS 4000

More information on the rotary encoder PSENenco:

Webcode 7331

Online information at www.pilz.com

Safety switches

PSENmech

PSENmag

PSENcode

PSENbolt

PSENhinge

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

Pilz safety gate components are particularly economical in meeting the requirements of EN 1088. That's why they are used for applications in mechanical engineering as well as in the packaging or pharmaceutical industry and many other sectors.

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

Choose the optimum switch for your application:

- Mechanical – with safe guard locking, PSENmech provides personal and process protection
- 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

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

The safety bolt PSENbolt is particularly suitable for safety gates that are difficult to adjust or in areas where safety gates are often opened and closed. What you get is a complete solution comprising safety switch, handle and bolt.

Safe hinge switch – package includes hinge and safety switch

The combination of hinge and safety switch is the optimum solution for hinged safeguards. Designed as one functional and installation unit, the safe hinge switch PSENhinge offers a high level of flexibility in installation, connection and adjustment.

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

Type	Safety switch PSENmech	Safety switch PSENmag	Safety switch PSENcode	Safety bolt PSENbolt	Hinge switch PSENhinge
Operation	Mechanical	Non-contact, magnetic	Non-contact, coded	Mechanical	Mechanical
Application					
Covers	◆	◆	◆	◆	
Flaps	◆	◆	◆	◆	◆
Hinged safety gates	◆	◆	◆	◆	◆
Sliding safety gates	◆	◆	◆	◆	
Rolling doors		◆	◆		
Position detection		◆	◆		
Manipulation protection	Normal	Normal	Very high	Very high [1]	High
Guard locking	With	Without	Without	With [2]	Without
IP protection type	IP67	IP67/IP69K	IP67/IP69K	[3]	IP67
Performance Level [4]					
PL e	2 x	1 x	1 x	[3]	2 x
PL d	1 x + FE [5]	1 x	1 x	[3]	1 x + FE [5]
PL c	1 x	1 x	1 x	[3]	1 x

[1] When using coded safety switches PSENcode [2] When using mechanical safety switch PSEN me1 with guard locking [3] Depends on which safety switch is used
[4] Achievable performance level, depending on application [5] FE = Fault exclusion

Keep up-to-date on safety switches:

Webcode 5173

Online information at www.pilz.com

Mechanical safety switch PSENmech

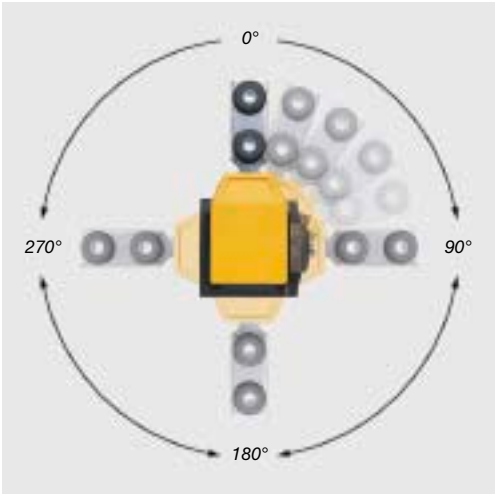
PSEN me1

Lock the safety gate securely

The mechanical safety switch PSENmech is suitable for safe monitoring of a movable guard.

PSENmech also uses increased extraction force on the actuator to prevent the safety gate from being opened unintentionally. The mechanical safety switch complies with the standard EN 1088 due to its coded actuators.

PSENmech ensures that the safety gate is interlocked (guard locking) until the hazardous production process is complete. This guarantees both personal and process protection.

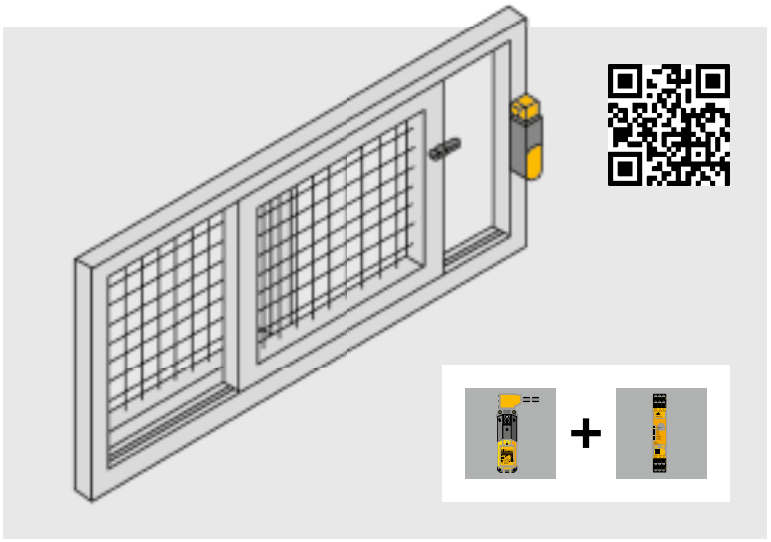


Universal actuation directions provide flexibility during installation.

Type code for PSENmech

PSEN me1.2S/1AR

Product area	Product series	Series 1: Type of guard locking/ supply voltage	Series/actuator type
Pilz SENsors	**1 With guard locking, dimensions: 170 x 42.5 x 51 mm**	S Spring force, 24 VAC/DC (2 NC, 2 NO)	1AS Standard, Series 1
Product range me – PSENmech		**.2S Spring force, 110, 230 VAC (2 NC, 2 NO)**	**1AR Radius, Series 1**
Operation Mechanical		M Magnetic force, 24 VAC/DC (2 NC, 2 NO)	
		.21S Spring force, 110, 230 VAC (3 NC, 1 NO)	



Components for your safe solution	Order number
Sensor: PSEN me1M/1AS	570 004
Connection: Cable, depending on function, e.g. 8 x 0.5 mm²	-
Evaluation device: PNOZ s3	751 103

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

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

Keep up-to-date on the entire program and on the mechanical safety switch PSENmech:

Webcode 5174

Online information at www.pilz.com

Selection guide – PSENmech

Mechanical safety switch with separate actuator and guard locking device

Common features

- Safety switch 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
- Can be connected to all Pilz evaluation devices
- Actuation directions:
  - PSEN me1: eight
  - PSEN me3: four
  - PSEN me4: eight
- Dimensions (H x W x D, excl. actuator):
  - PSEN me1: 170 x 42.5 x 51.0 mm
  - PSEN me3: 90 x 52.0 x 33.0 mm
  - PSEN me4: 100 x 31.0 x 30.5 mm
- Ambient temperature:
  - PSEN me1: -25 … +70 °C/-13 … +158 F
  - PSEN me3/me4: -30 … +80 °C/-22 … +176 F
- Connection terminals:
  - PSEN me1: Spring-loaded terminals
  - PSEN me3/me4: Screw terminals
- Protection type:
  - PSEN me1: IP67
  - PSEN me3/me4: IP65

PSEN me1S/1AS

PSEN me3/2AR

PSEN me4/4AS

Type	Type of guard locking
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 force
PSEN me1M/1AR	Magnetic force
PSEN me1.21S/1AR	Spring force
PSEN me3/2AS	
PSEN me3.2/2AS	
PSEN me3.2/2AR	
PSEN me4.1/4AS	
PSEN me4.2/4AS	

Actuator type	Contacts	Supply voltage/ contact load Utilisation category AC-15	Auxiliary release	Holding force	Extraction force	Order number [1]
Standard	2 NC 2 NO	24 V AC/DC	◆	1500 N	min. 27 N	570000
Standard	2 NC 2 NO	110 … 230 V AC	◆	1500 N	min. 27 N	570006
Radius	2 NC 2 NO	24 V AC/DC	◆	1500 N	min. 27 N	570001
Radius	2 NC 2 NO	110 … 230 V AC	◆	1500 N	min. 27 N	570007
Standard	2 NC 2 NO	24 V AC/DC		1500 N	min. 27 N	570004
Radius	2 NC 2 NO	24 V AC/DC		1500 N	min. 27 N	570005
Radius	3 NC 1 NO	110 … 230 V AC	◆	1500 N	min. 27 N	570008
Standard	1 NC 1 NO	240 V/3.0 A		-	10 N	570210
Standard	2 NC 1 NO	240 V/1.5 A		-	10 N	570230
Radius	2 NC 1 NO	240 V/1.5 A		-	10 N	570232
Standard	2 NC	240 V/3.0 A		-	10 N	570245
Standard	2 NC 1 NO	240 V/1.5 A		-	10 N	570251

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

[2] Applies for application of PSEN me1.2

★ *Recommended type*

Technical documentation on the mechanical safety switch PSENmech:

Webcode 5174

Cable and other accessories:

From page 76

Webcode 5171

Online information at www.pilz.com

Magnetic safety switch PSENmag

IP67

PSEN ma1.4a

PSEN ma1.4p

PSEN 1.2p

PSEN ma1.3a

Highest level of safety at a low price

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. A large selection of connectors and cables plus an assured operating distance of 3 to 12 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.

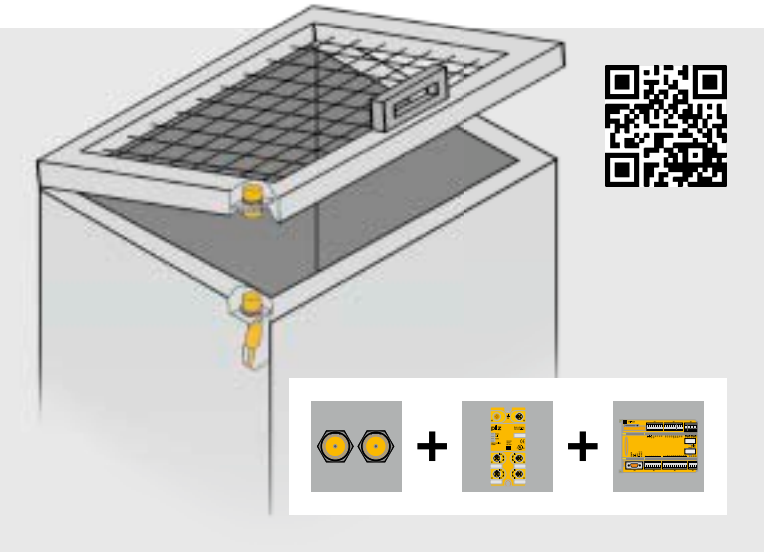
The rugged, fully encapsulated housing in conjunction with the non-contact, magnetic operating principle guarantees a long product service life.

Type code for PSENmag

PSEN ma1.4a-50

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

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



Components for your safe solution	Order number
Sensor: PSEN ma1.3n-20/PSEN ma1.3-12	506238
Connection: PSS67 cable, M12, straight, socket/ M12, straight, connector, 5 m	380209
Decentralised periphery: PDP67 F 8DI ION	773600
Connection: PSEN cable, straight, M12, 5-pin	630311
Evaluation device: PNOZmulti	773100

The optimum solution: monitoring a cover using PSENmag safety switch and the control system PNOZmulti.

Your benefits at a glance

- Safe complete solution with TÜV certification for the highest category applications
- Economical thanks to:
  - Space and time-saving installation
  - Long product service life as it is mechanically non-wearing
  - User-friendly diagnostics via an additional signal contact and LED
- Can be used with heavy soiling and strict hygiene regulations IP67/IP69K, ECOLAB tested
- High level of safety, even in potentially explosive areas

Manipulation protection

Installation of the sensor is concealed – as defined in accordance with EN 1088 – preventing manipulation. Other ways of manipulation are excluded if the actuator is secured using safety screws (one-way screws). If the greatest possible manipulation protection is required, we recommend PSENcode on account of the RFID technology and key lock principle.

Keep up-to-date on the non-contact, magnetic safety switch PSENmag:

Webcode 5179

Online information at www.pilz.com

Selection guide – PSENmag

Magnetic safety switch 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 PNOZ s3, PNOZ s4, PNOZ s5, PNOZ e1p, PNOZ e1.1p, PNOZ e1vp, PNOZ e5.11p
- Connected directly, via PDP67 or via the interface PSEN ix1, see accessories from page 76
- Protection type:
  - Cable versions: IP69K
  - Connector versions: IP67
- Flexible installation due to the housing design and pigtail cable
- Protective caps included for better manipulation protection

PSEN ma1.4a

PSEN ma1.4p

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 ma1.4a-57/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 ma1.4p-57/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 ma1.4-51M12/8-0.15m/ PSEN ma1.4-10	10 mm
PSEN ma1.4a-57/PSEN ma1.4-03	3 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-57/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 ma1.4-51M12/8-0.15m/ PSEN ma1.4-03	3 mm
PSEN 1.1p-23/PSEN 1.1-20	8 mm
PSEN 1.1p-25/PSEN 1.1-20	8 mm

Contacts	Single connection	Series connection via	LED	ATEX	Connection type Cable/connector	Order number[1]
	◆	-			5 m	506322
	◆	-	◆		5 m	506326
		PSEN ix1			5 m	506323
		PSEN ix1	◆		5 m	506327
	◆	-			M8, 4-pin, pigtail, 25 cm	506 334
	◆	-	◆		M8, 8-pin, pigtail, 25 cm	506338
		PSEN ix1			M8, 4-pin, pigtail, 25 cm	506335
		PSEN ix1	◆		M8, 8-pin, pigtail, 25 cm	506339
	◆	PDP67			M12, 5-pin, pigtail, 15 cm	506342
	◆	PDP67	◆		M12, 5-pin, pigtail, 15 cm	506343
	◆	-	◆		M12, 8-pin, pigtail, 15 cm	506345
		PSEN ix1	◆		5 m	506325
	◆	-			5 m	506320
	◆	-	◆		5 m	506324
		PSEN ix1			5 m	506321
	◆	-			M8, 4-pin, pigtail, 25 cm	506332
	◆	-	◆		M8, 8-pin, pigtail, 25 cm	506336
		PSEN ix1	◆		M8, 8-pin, pigtail, 25 cm	506337
		PSEN ix1			M8, 4-pin, pigtail, 25 cm	506333
	◆	PDP67			M12, 5-pin, pigtail, 25 cm	506340
	◆	PDP67			M12, 5-pin, pigtail, 25 cm	506341
	◆	-	◆		M12, 8-pin, pigtail, 15 cm	506344
	◆	-		◆	M8, 4-pin	504223
		PSEN ix1		◆	M8, 4-pin	504225

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

★ *Recommended type*

Technical documentation on the magnetic safety switch PSENmag:

Webcode 5179

Cable and other accessories:

From page 76

Webcode 5171

Online information at www.pilz.com

Selection guide – PSENmag

Magnetic safety switch PSENmag – Round 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 PNOZ s3, PNOZ s4, PNOZ s5, PNOZ e1p, PNOZ e1.1p, PNOZ e1vp, PNOZ e5.11p
- Connected directly, via PDP67 or via the interface PSEN ix1, see accessories from page 76
- Protection type:
  - Cable versions: IP69K
  - Connector versions: IP67

PSEN ma1.3

Type	Assured switching 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 ma1.3-20M12/8-0.15m/ PSEN ma1.3-08	8 mm
PSEN ma1.3p-22/PSEN ma1.3-08	8 mm
PSEN ma1.3b-23/PSEN ma1.3-08	8 mm
PSEN ma1.3b-25/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 ma1.3-20M12/8-0.15m/ PSEN ma1.3-12	12 mm
PSEN ma1.3p-22/PSEN ma1.3-12	12 mm
PSEN ma1.3b-23/PSEN ma1.3-12	12 mm
PSEN ma1.3b-25/PSEN ma1.3-12	12 mm

Contacts	Single connection	Series connection via	LED	ATEX	Connection type Cable/connector	Order number[1]
	◆	-	◆		5 m	506220
		PSEN ix1	◆		5 m	506221
	◆	-	◆		10 m	506222
		PSEN ix1	◆		10 m	506223
	◆	-	◆		M8, 8-pin, pigtail, 25 cm	506226
	◆	PDP67	◆		M12, 5-pin, pigtail, 15 cm	506228
	◆	-	◆		M12, 8-pin, pigtail, 15 cm	506229
		PSEN ix1	◆		M8, 8-pin, pigtail, 25 cm	506227
	◆	-	◆	◆	10 m	506224
		PSEN ix1	◆	◆	10 m	506225
	◆	-	◆		5 m	506230
		PSEN ix1	◆		5 m	506231
	◆	-	◆		10 m	506232
		PSEN ix1	◆		10 m	506233
	◆	-	◆		M8, 8-pin, pigtail, 25 cm	506236
	◆	PDP67	◆		M12, 5-pin, pigtail, 25 cm	506238
	◆	-	◆		M12, 8-pin, pigtail, 15 cm	506239
		PSEN ix1	◆		M8, 8-pin, pigtail, 25 cm	506237
	◆	-	◆	◆	10 m	506234
		PSEN ix1	◆	◆	10 m	506235

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

★ *Recommended type*

Technical documentation on the magnetic safety switch PSENmag:

Webcode 5179

Cable and other accessories:

From page 76

Webcode 5171

Online information at www.pilz.com

Coded safety switch PSENcode

IP67

PSEN cs4.1a

PSEN cs4.1p

PSEN cs1.1p

Highest level of manipulation protection in the smallest space

The non-contact, coded safety switch PSENcode is 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 thanks to RFID technology.

The unique fully coded version of PSENcode has the highest level of manipulation protection: the sensor will only accept a single actuator (key lock principle).

What's more, other ways of manipulation can be excluded if the actuator is secured using one-way safety screws – as recommended in EN 1088.

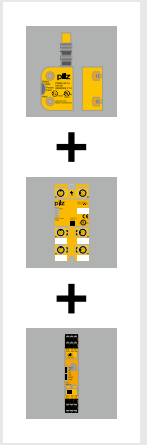
If the requirements for manipulation protection are less stringent, other versions of PSENcode are used. The coded PSENcode is accepted by other PSENcode actuators. The fully coded PSENcode only accepts one actuator. In contrast to the unique, fully coded safety switch, it's possible to teach-in a new actuator on the switch retrospectively.

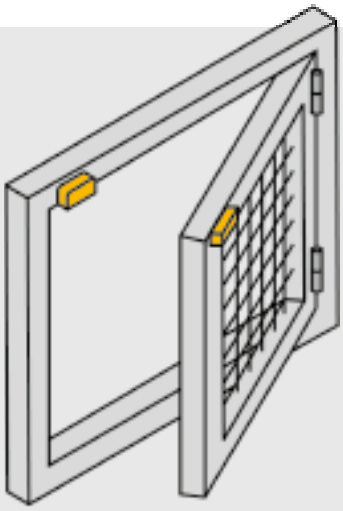
Type code for PSENcode

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 ▸ Compact design: Cable, 5 m [1]
Operation ▸ Non-contact, coded ▸ Transponder (RFID) ▸ With safe semiconductor outputs	**2.1 Fully coded, large design** 2.2 Unique, fully coded, large design 3.1 Coded, compact design 4.1 Fully coded, compact design 4.2 Unique, fully coded, compact design	**3 With ATEX**	b ▸ Large design: not available ▸ Compact design: Cable, 10 m [1] n ▸ Large design: Connector, M12, 5-pin ▸ Compact design: Connector, M12, 5-pin **p ▸ Large design: Connector, M12, 8-pin** **▸ Compact design: Connector, M8, 8-pin** [1] M12/8 ▸ Compact design: Connector, M12, 8-pin [1]

[1] *Series connection integrated within the sensor*





Components for your safe solution	Order number
Sensor: PSEN cs4.2 M12, 8-pin, 0.15 m/PSEN cs4.1	541 209
Connection: PSEN cable, M12, 8-pin, straight, connector/ M12, 8-pin, straight, connector, 5 m	540 341
Decentralised periphery: PDP67 F 4 code	773 603
Connection: PDP67 cable, M12, 8-pin, straight, connector, 30 m	380 704
Evaluation device: PNOZ s3	751 103

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

Your benefits at a glance

- Highest level of safety and plant availability
- Highest level of manipulation protection in the smallest space
- 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/IP69K
  - Flexible installation
- Economical:
  - Space-saving installation due to the compact housing
  - Highest level of safety, even when connected in series with PSENcode, PSENini, PSENslock and PSENsgate

Simple implementation saves time and money

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

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

High flexibility due to 5 actuation directions on the PSEN cs1.1.

Keep up-to-date on the coded safety switch PSENcode:

Webcode 5184

Online information at www.pilz.com

Selection guide – PSENcode

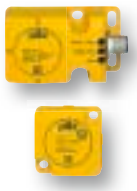
Energy saving by Pilz [1)]

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 (OSSD) for connection to evaluation devices from Pilz or other manufacturers
- Series connection with PSENcode, PSENini, PSENslock and PSENsgate 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:
  - With 8-pin connector via Y junction (cable separator) or PDP67 F 4 code
  - With 5-pin connector via PDP67 F 8DI ION
- Protection type:
  - Cable version: IP69K
  - Connector version: IP67K
- 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

Coded safety switch PSENcode with 8-pin connector and integrated

PSEN cs4.1a



PSEN cs1.1p

	Type
	PSEN cs3.1a/PSEN cs3.1
	PSEN cs3.1p/PSEN cs3.1
	PSEN cs3.1 M12/8-0.15m/PSEN cs3.1
	PSEN cs3.1 M12/8-1.5m/PSEN cs3.1
	PSEN cs4.1a/PSEN cs4.1
	PSEN cs4.1p/PSEN cs4.1
	PSEN cs4.1 M12/8-0.15m/PSEN cs4.1
	PSEN cs4.2a/PSEN cs4.1
★	PSEN cs4.2p/PSEN cs4.1
	PSEN cs4.2 M12/8-0.15m/PSEN cs4.1
	PSEN cs1.1p/PSEN cs1.1
	PSEN cs1.13p/PSEN cs1.1
	PSEN cs2.1p/PSEN cs2.1
	PSEN cs2.13p/PSEN cs2.1
★	PSEN cs2.2p/PSEN cs2.1

Coded safety switch PSENcode with 5-pin connector for PDP67 F 8

PSEN cs3.1n

	PSEN cs3.1n/PSEN cs3.1
	PSEN cs4.1n/PSEN cs4.1
★	PSEN cs4.2n/PSEN cs4.1
	PSEN cs1.1n/PSEN cs1.1
	PSEN cs2.1n/PSEN cs2.1
	PSEN cs2.2n/PSEN cs2.1

series connection

Coding type	Size	ATEX	Connection type	Order number [2]
Coded [3]	Compact		Cable, 5 m	541011
Coded [3]	Compact		Connector, M8, 8-pin	541010
Coded [3]	Compact		Connector, M12, 8-pin, pigtail, 15 cm	541009
Coded [3]	Compact		Connector, M12, 8-pin, pigtail, 1.5 m	541014
Fully coded [4]	Compact		Cable, 5 m	541111
Fully coded [4]	Compact		Connector, M8, 8-pin, pigtail, 15 cm	541110
Fully coded [4]	Compact		Connector, M12, 8-pin, pigtail, 15 cm	541109
Unique, fully coded [5]	Compact		Cable, 5 m	541211
Unique, fully coded [5]	Compact		Connector, M8, 8-pin, pigtail, 15 cm	541210
Unique, fully coded [5]	Compact		Connector, M12, 8-pin, pigtail, 15 cm	541209
Coded [3]	Large		Connector, M12, 8-pin	540000
Coded [3]	Large	◆	Connector, M12, 8-pin	540005
Fully coded [4]	Large		Connector, M12, 8-pin	540100
Fully coded [4]	Large	◆	Connector, M12, 8-pin	540105
Unique, fully coded [5]	Large		Connector, M12, 8-pin	540200

DI ION

Coded [3]	Compact		Connector, M12, 5-pin, pigtail, 15 cm	541003
Fully coded [4]	Compact		Connector, M12, 5-pin, pigtail, 15 cm	541103
Unique, fully coded [5]	Compact		Connector, M12, 5-pin, pigtail, 15 cm	541203
Coded [3]	Large		Connector, M12, 5-pin	540003
Fully coded [4]	Large		Connector, M12, 5-pin	540103
Unique, fully coded [5]	Large		Connector, M12, 5-pin	540203

[1] For all PSEN cs3/cs4 *[2] Order number for sensor and actuator (one unit)*
[3] Coded = Switch accepts any PSENcode actuator
[4] Fully coded = Switch accepts only one PSENcode actuator, teach-in up to 8 times
[5] Unique, fully coded = Switch accepts only one PSENcode actuator, no teach-in facility
★ *Recommended type*

Technical documentation on the coded safety switch PSENcode:

Webcode 5184

Cable and other accessories:

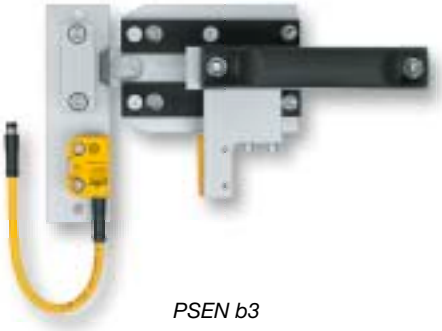
From page 76

Webcode 5171

Online information at www.pilz.com

Safety bolt PSENbolt

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, the safety bolt PSENbolt offers you the safe, complete solution comprising safety switch, handle and bolt.

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

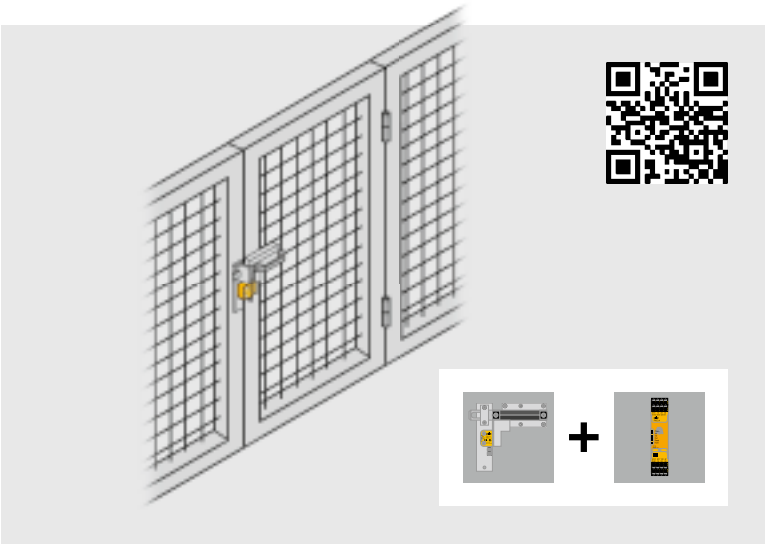
Longer service life for the integrated safety switch

The actuator is mechanically guided into the actuator head of the safety switch PSEN me1. 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 Pilz **SEN**sors	Escape release/ locking pin	Can be combined with
Product range **b – PSENbolt**		
Operation Depends on the selected safety switch: ▸ Mechanical ▸ Magnetic ▸ Coded	1 Without escape release, without locking pin 2 With escape release, with locking pin, can be deactivated 2.1 With escape release, with locking pin, cannot be deactivated	▸ Mechanical safety switches PSENmech with guard locking (PSEN me1 series) ▸ Non-contact, coded safety switches PSENcode (PSEN cs1, PSEN cs2 series)
	3 Without escape release, without locking pin 4 With escape release, with locking pin, can be deactivated **4.1 With escape release, with locking pin, cannot be deactivated**	▸ Non-contact, magnetic safety switches PSENmag (PSEN ma1.4 series) ▸ Non-contact, coded safety switches PSENcode (PSEN cs3, PSEN cs4 series)



Components for your safe solution	Order number
Sensor: PSEN b4.1 combined with PSEN cs4.1n/PSEN cs4.1	540041 541103
Connection: PSEN cable, M12, 5-pin, 5 m	630311
Evaluation device: PNOZ s4	751104

The optimum solution: monitoring swing gates using the safety bolt PSENbolt with PSENcode and safety relay PNOZsigma.

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 (RFID)
  - Locking pin protects the bolt from closing unintentionally
  - Escape release available as an option

Latest information and technical documentation on the safety bolt PSENbolt:

Webcode 5191

Cable and other accessories:

From page 76

Webcode 5171

Online information at www.pilz.com

Selection guide – Safety bolt PSENbolt

PSEN b1

PSEN b3

Type	Can be combined with	Escape release	Locking pin	Order number[3]
PSEN b1	▸ PSEN me1 ▸ PSEN cs1 ▸ PSEN cs2			540010
PSEN b2		◆	◆[1]	540020
PSEN b2.1		◆	◆[2]	540021
PSEN b3	▸ PSEN ma1.4 ▸ PSEN cs3 ▸ 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
★ *Recommended type*

Safe hinge switch 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 is suitable for rotatable and hinged gates as well as flaps. Greater manipulation protection is achieved by concealing the installation within the guard.

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

With re-adjustable 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°. Even after setting the switching point, the user can still correct the setting of the hinge with the integrated precision adjustment system.

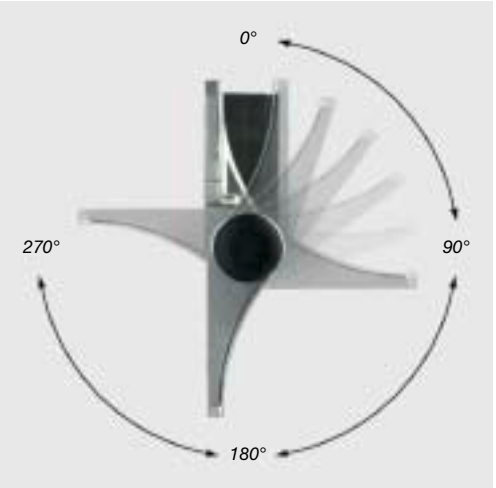
Maximum flexibility

The change kit can be used to redefine the switching point when the plant is upgraded.

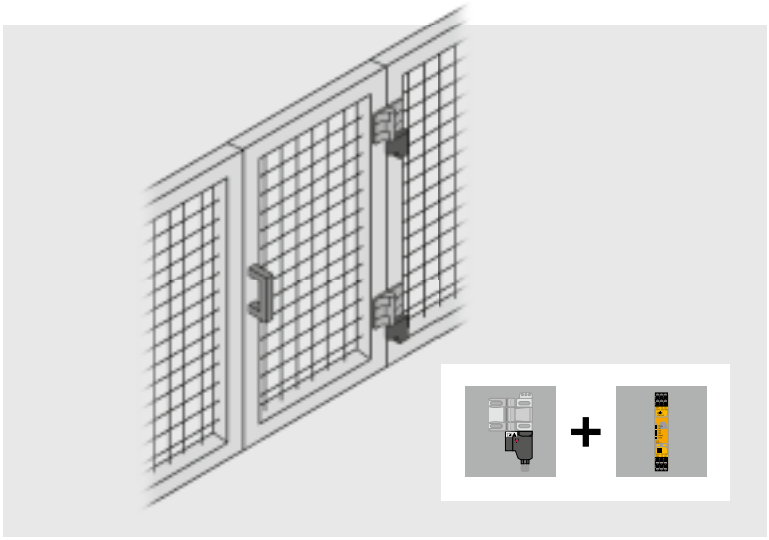
Type code for PSENhinge

PSEN hs1.1p

Product area Pilz **SEN**sors	Contacts	Door stop	Connection
Product range **hs – PSENhinge**	**1** **NC/NC**	**1** **Right** 2 Left	**p** **Connector, M12, 4-pin** (compatible with M12, 5-pin)
Operation Mechanical			



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



Components for your safe solution	Order number
Sensor: PSEN hs1.1p	570270
Connection: PSEN cable, M12, 4-pin, 5 m	630301
Evaluation device: PNOZ s3	751103

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

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 within the safeguard
- Highest flexibility in installation, connection and adjustment:
  - Switching point is free to set from 0° to 270° and is re-adjustable
  - Protection type IP67
- User-friendly:
  - Slot fastening for mounting on profiles
  - Simple re-adjustment 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 switch 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, when two switches are used
- 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 6574

Cable and other accessories:

From page 76

Webcode 5171

Online information at www.pilz.com

Safety gate systems

PSEN sl-0.5p

PSEN sl-1.0p 1.1 VA

PSEN sg1c-2/1

PSEN sg1c-5/0

For guard protection

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 ▸ Transponder technology	▸ Mechanical ▸ Coded ▸ Transponder technology
Manipulation protection	Very high [2]	Very high [2]
Position monitoring	PL e of EN ISO 13849-1	PL e of EN ISO 13849-1
Guard locking	Process guard locking (magnetic interlock)	Safe guard locking up to ▸ PL e of EN ISO 13849-1 ▸ SIL CL 3 of EN/IEC 62061
Auxiliary/escape release	No	Integrated
E-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 ▸ Additional control elements (LED) ▸ Broken pin and broken bolt are detected ▸ Closing lock (padlock on the bolt) ▸ Enable switch can be connected

[1] Limited suitability, without escape release

[2] When unique, fully coded version is used

Keep up-to-date on safety gate systems:

Webcode 5192

Online information at www.pilz.com

Safety gate system PSENslock

PSEN sl-0.5p

PSEN sl-1.0p

PSEN sl-1.0p 1.1 VA

Safe position monitoring with process guarding in one system

The safety gate system PSENslock provides secure safety gate monitoring with a holding force 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 is designed for the highest category applications.

Stringent protection of man and machine

PSENslock is 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

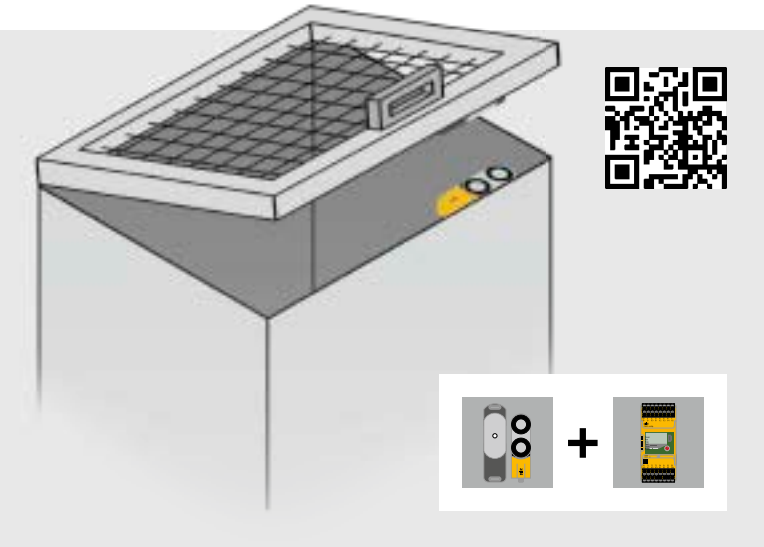
Thanks to its different assembly directions, PSENslock can be installed and commissioned quickly and easily. It is optimised for mounting on the popular 45 mm profiles.

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 VA

Product area Pilz **SEN**sors	Magnetic force	Connection	Coding	Material
Product range **sl – PSENslock**	0.5 500 N **1.0 1 000 N**	**p Connector, M12, 8-pin (series connection integrated within the sensor)**	1.1 Coded 2.1 Fully coded **2.2 Unique, fully coded**	**VA With stainless steel elements** **- Base plate** **- Connector**
Operation ▸ Non-contact, coded ▸ Transponder (RFID) ▸ With safe semiconductor outputs				



Components for your safe solution	Order number
Sensor: PSEN sl-1.0p 2.2/PSEN sl-1.0	570602
Connection: PSEN cable, M12, 8-pin, 5 m	540320
Evaluation device: PNOZ mm0p ▸ Spring loaded terminals (1 set)	772000 751008

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
- Rapid 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

Keep up-to-date on the safety gate system PSENslock:

Webcode 5193

Online information at www.pilz.com

Selection guide – PSENslock

Energy saving by Pilz

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, with magnetic guard locking for process protection tasks
- 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 via Y junction (cable separator) or PDP67 F4 code
- Electrical data:
  - Supply voltage: 24 VDC
  - Outputs: 2 safety outputs and 1 signal output
- Mechanical data:
  - Vertical and lateral offset: +/-3 / +/-5 mm
  - Protection type: IP67

Safety gate system PSENslock with 8-pin connector

PSEN sl-0.5p

PSEN sl-1.0p 1.1 VA

Type	Coding type
PSEN sl-0.5p 1.1/PSEN sl-0.5	Coded [3]
PSEN sl-0.5p 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-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-1.0p 2.1/PSEN sl-1.0	Fully coded [4]
PSEN sl-1.0p 2.2/PSEN sl-1.0	Unique, fully coded [5]

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, 8-pin	570501
500 N	4.8 W	122 x 45 x 44	138 x 52 x 23	Connector, M12, 8-pin	570502
1000 N	7.2 W	172 x 45 x 44	188 x 52 x 22	Connector, M12, 8-pin	570600
1000 N	7.2 W	172 x 45 x 44	188 x 52 x 22	Connector, M12, 8-pin	570630
1000 N	7.2 W	172 x 45 x 44	188 x 52 x 22	Connector, M12, 8-pin	570601
1000 N	7.2 W	172 x 45 x 44	188 x 52 x 22	Connector, M12, 8-pin	570602

[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*

Technical documentation on the safety gate system PSENslock:

Webcode 5193

Cable and other accessories:

From page 76

Webcode 5171

Online information at www.pilz.com

Safety gate system PSENsgate

PSEN sg1c-2/1 *PSEN sg1c-5/0*

The integrated system for safety gate monitoring

PSENsgate combines 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.

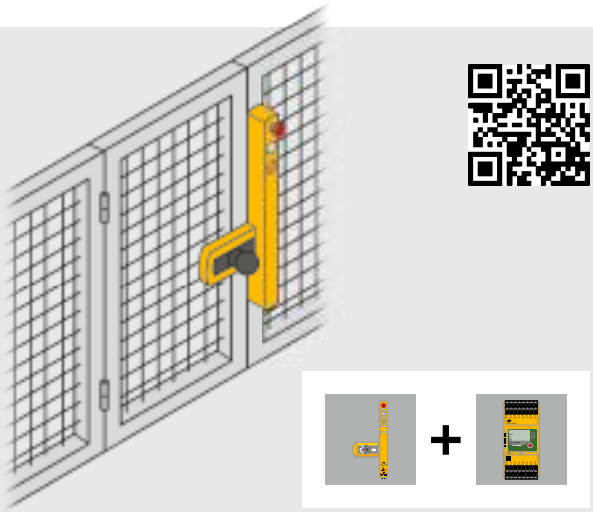
With PSENsgate you save time and money during configuration, design, documentation, purchasing and installation.

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

Type code for PSENsgate

PSEN sg1c-2/1 2.2

Product area Pilz **SEN**sors	Type	Connection via	Number of request or reset buttons	Number of E-STOPs	Coding
Product range sg – PSENsgate	**1 With safe guard locking and safety gate monitoring**	**c Spring-loaded terminal, plug-in**	**2 2 illuminated buttons** 4 4 illuminated buttons 5 5 illuminated buttons	0 Without E-STOP **1 1 E-STOP**	**2.2 Unique, fully coded**
Operation ▸ Mechanical, coded ▸ Transponder (RFID) ▸ With safe semiconductor outputs					



Components for your safe solution	Order number
Sensor: PSEN sg1c-4/1	570701
Connection: Cable, depending on function, e.g. 16 x 0.25 mm²	-
Evaluation device: PNOZ mm0p ▸ Spring loaded terminals (1 set)	772000 751008

The optimum solution: monitoring a safety gate using the safety gate system PSENsgate and the safety relay PNOZmulti Mini.

Your benefits at a glance

- 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 personal and plant protection up to PL e
- Suitable for 45 mm profiles
- Diagnostic LED enables fast reaction times to status changes
- Integrated emergency stop removes the need for an evaluation device and expansion modules
- Save power, PSENsgate is optimised for energy efficiency (gate locked max. 2 W)
- Safe, complete solution when combined with Pilz control technology

Keep up-to-date on the safety gate system PSENsgate:

Webcode 6474

Online information at www.pilz.com

Selection guide – PSENsgate

Energy saving by Pilz

Safety gate system PSENsgate

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:
  - With 8-pin connector via Y junction (cable separator) or PDP67 F 4 code
  - With 5-pin connector via PDP67 F 8DI ION
- Electrical data:
  - Supply voltage: 24 VDC
  - Outputs: 2 (semiconductor, each max. 500 mA)
  - 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 %
- Mechanical data:
  - Vertical and lateral offset: +/-5 / +/-5 mm
  - Holding force, swing gate: 2 000 N
  - Connection type: plug-in spring-loaded terminals
  - Protection type: IP65/54

PSEN sg1c-2/1

Type
PSEN sg1c-2/1
PSEN sg1c-4/1
PSEN sg1c-5/0
PSEN sg1c-2/1 2.2

Number of pushbuttons	Number of E-STOPs	Dimensions (H x W x D) in mm	Coding type	Order number
2 [1)]	1	455.0 x 200 x 105	Coded	570 700
4 [2)]	1	546.0 x 200 x 105	Coded	570 701
5	0	558.5 x 200 x 105	Coded	570 750
2 [1)]	1	455.0 x 200 x 105	Unique, fully coded	570 702

[1)] 2 illuminated buttons: 1 request button, 1 reset button
[2)] 4 illuminated buttons: 1 request button, 1 reset button, 2 free pushbuttons (100 mA)
★ *Recommended type*

Technical documentation on the safety gate system PSENsgate:

Webcode 6474

Cable and other accessories:

From page 76

Webcode 5171

Online information at www.pilz.com

Optoelectronic protective devices

Access protection

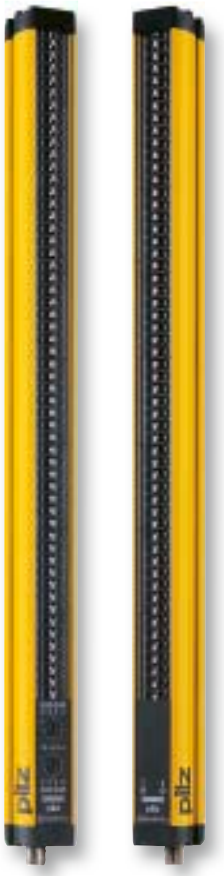
Body protection

Hand protection

Finger protection

PSEN op4F…/1

SafetyBUS p®



PSEN opSB-4F

For safe access to the production process

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 beam devices, light curtains and light grids with semiconductor outputs are suitable for all type 2 and type 4 applications in accordance with EN/IEC 61496-1/-2. Read more from page 48.

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 64.

Select the right PSENopt to conform to the standard

Carry out a safety assessment and evaluate the risk in accordance with EN/IEC 61496-1/-2. You can then use this information to work out the appropriate light curtain 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 optical 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
Approved to EN/IEC 61496-1/-2	Type 2	Type 4	Type 4
Can be used in applications in accordance with			
EN ISO 13849-1	PL d	PL e	PL e
EN/IEC 62061	SIL CL 2	SIL CL 3	SIL CL 3
EN 954-1	Category 2	Category 4	Category 4
Light beam opening angle	5 °	2.5 °	5 °
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 … 1800 mm		300 … 1650 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 optoelectronic protective devices PSENopt:

Webcode 5196

Online information at www.pilz.com

Optoelectronic protective devices with se

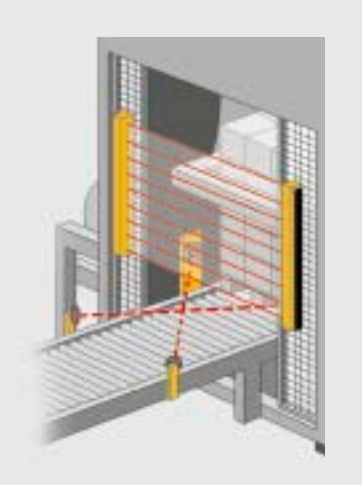
PSEN op4F…/1

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.

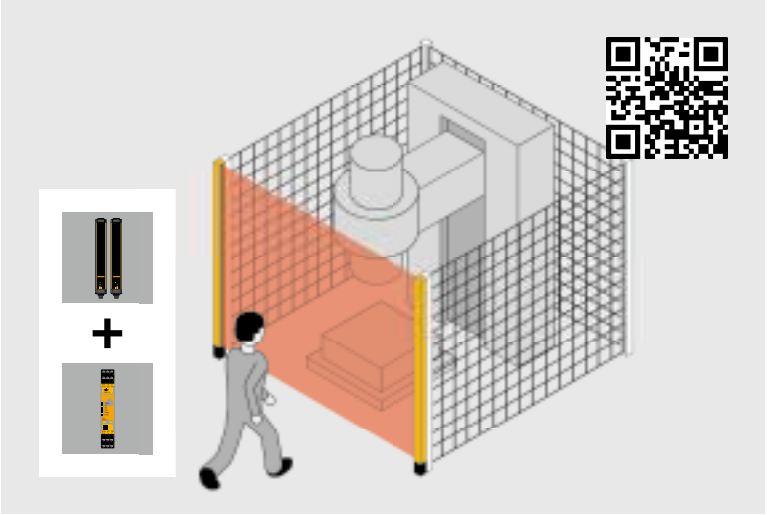
Type code for PSENopt

PSEN op4F-s-14-120/1

Product area Pilz **SEN**sors	Approval	Resolution	Functions	Resolution/ No. of beams	Feature/Height of protected field	Generation
Product range op – PSENopt	2 Type 2 **4 Type 4**	S Access protection (light beam device) B Body protection (light grid) H Hand protection (light curtain) **F Finger protection (light curtain)**	_ Muting (total/partial) **s Standard** [1] b Blanking [1] m Cascading Master [1] bm Blanking/ Cascading Master [1] sl Cascading Slave [1] S Linear Version L L-Version T T-Version	1 1 beam 2 2 beams 3 3 beams 4 4 beams **14 14 mm** 30 30 mm	1 Infrared 2 Laser 015 150 mm 030 300 mm 045 450 mm 050 500 mm 060 600 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	**/1 New generation PSENopt**
Operation ▸ Non-contact, optical, 2D (area monitoring) ▸ With safe semiconductor outputs	Approved to EN/IEC 61496-1/-2					

[1] *incl. feedback loop monitoring*

miconductor outputs – PSENopt



Components for your safe solution	Order number
Sensor: PSEN op4H-s-30-090/1	630765
Connection: ▸ PSEN op cable, shielded, straight, M12, 4-pin, 5 m	630304
▸ PSEN op cable, shielded, straight, M12, 8-pin, 5 m	630314
Evaluation device: ▸ PNOZ s3 (for one light grid)	751103
▸ PNOZ mm0p (for several light grids)	772000
- Spring loaded terminals (1 set)	751008

The optimum solution: monitoring the infeed area on a press using the light grid PSENopt and safety relay PNOZsigma.

Your benefits at a glance

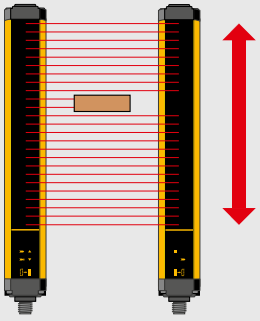
- Economical:
  - Protected fields and detection capability can be set up to be process-oriented
  - Cost savings with PSENopt integration, operation and maintenance
- Functionalities which increase the efficiency and availability of your plant:
  - Muting to distinguish between a person and material
  - Cascading function for effective protection against encroachment into and behind the protected area
  - Blanking for a flexible, uninterrupted material flow
- Protects 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 optoelectronic protective devices PSENopt:

Webcode 5197

Online information at www.pilz.com

Selection guide – PSENopt

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

Common features

- PL e/SIL CL 3 in conjunction with
  - Safety relay PNOZ e7p
  - Configurable control systems PNOZmulti: PNOZ m0p, PNOZ m1p, PNOZ m2p
  - Programmable control system PSS: PSS DI2O T
- Supply voltage: 20 … 30 VDC
- Design: M18

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

Body protection: Type 2 – Light grids PSEN op2B

Common features

- Compliant and approved in accordance with
  - EN/IEC 61508 and
  - EN/IEC 61496-1/-2
- For use in applications up to
  - PL d of EN ISO 13849-1
  - SIL CL 2 of EN/IEC 62061
  - Cat. 2 of EN 954-1
- Function selection:
  - Manual/automatic restart
  - Muting (total/partial) via DIP switch
  - Override function
- Semiconductor outputs
- Supply voltage: 24 VDC
- Connection:
  - Receiver Rx: Connector, M12, 8-pin
  - Transmitter Tx: Connector, M12, 4-pin
- Dimensions: 35 x 40 mm

PSEN op2B-3-080

Type
PSEN op2B-2-050
PSEN op2B-3-080
PSEN op2B-4-090
PSEN op2B-4-120

Resolution/Number of beams	Features	Operating range	Reaction time	Order number[1)]
Access protection (1 beam)	Infrared	0 … 8 m	1.5 ms max.	630380
Access protection (1 beam)	Infrared	0 … 8 m	1.5 ms max.	630381
Access protection (1 beam)	Laser	0 … 40 m	320 µs max.	630382

Resolution/Number of beams	Height of protected field	Operating range	Reaction time	Order number[1)]
2 beams	500 mm	0.5 … 50 m	14 ms	630200
3 beams	800 mm	0.5 … 50 m	14 ms	630201
4 beams	900 mm	0.5 … 50 m	14 ms	630202
4 beams	1200 mm	0.5 … 50 m	14 ms	630203

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

★ *Recommended type*

Technical documentation on the optoelectronic protective devices PSENopt:

Webcode 5197

Cable and other accessories:

From page 76

Webcode 5171

Online information at www.pilz.com

Selection guide – PSENopt

Hand protection: Type 2 – Light curtains PSEN op2H

Common features

- Compliant and approved in accordance with
  - EN/IEC 61508 and
  - EN/IEC 61496-1/-2
- For use in applications up to
  - PL d of EN ISO 13849-1
  - SIL CL 2 of EN/IEC 62061
  - Cat. 2 of EN 954-1
- Automatic restart
- Semiconductor outputs
- Supply voltage: 24 VDC
- Connection:
  - Receiver Rx: Connector, M12, 5-pin
  - Transmitter Tx: Connector, M12, 4-pin
- Dimensions: 32.3 x 36.9 mm

PSEN op2H-s-30-060/1

Type
PSEN op2H-s-30-015/1
PSEN op2H-s-30-030/1
PSEN op2H-s-30-045/1
PSEN op2H-s-30-060/1
PSEN op2H-s-30-075/1
PSEN op2H-s-30-090/1
PSEN op2H-s-30-105/1
PSEN op2H-s-30-120/1
PSEN op2H-s-30-135/1
PSEN op2H-s-30-150/1
PSEN op2H-s-30-165/1
PSEN op2H-s-30-180/1

Body protection: Type 4 – Light grids PSEN op4B

Common features

- Compliant and approved in accordance with
  - EN/IEC 61508,
  - 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
- Function selection:
  - Manual/automatic restart
  - Muting (total/partial) via DIP switch
  - Override function
- Semiconductor outputs
- Supply voltage: 24 VDC
- Connection:
  - Receiver Rx: Connector, M12, 8-pin
  - Transmitter Tx: Connector, M12, 4-pin
- Dimensions: 35 x 40 mm

PSEN op4B-3-080

Type	Resolution/ Number of beams
PSEN op4B-2-050	2 beams
PSEN op4B-3-080	3 beams
PSEN op4B-4-090	4 beams
PSEN op4B-4-120	4 beams

Resolution/Number of beams	Height of protected field	Operating range	Reaction time	Order number[1]
30 mm	150 mm	0.2 ... 19 m	8 ms	630720
30 mm	300 mm	0.2 ... 19 m	9 ms	630721
30 mm	450 mm	0.2 ... 19 m	11 ms	630722
30 mm	600 mm	0.2 ... 19 m	12 ms	630723
30 mm	750 mm	0.2 ... 19 m	14 ms	630724
30 mm	900 mm	0.2 ... 19 m	15 ms	630725
30 mm	1050 mm	0.2 ... 19 m	17 ms	630726
30 mm	1200 mm	0.2 ... 19 m	18 ms	630727
30 mm	1350 mm	0.2 ... 19 m	20 ms	630728
30 mm	1500 mm	0.2 ... 19 m	21 ms	630729
30 mm	1650 mm	0.2 ... 19 m	23 ms	630730
30 mm	1800 mm	0.2 ... 19 m	24 ms	630731

Height of protected field	Functions				Reaction time	Order number[1]
	Muting	Blanking	Cascading			
			Master	Slave		
500 mm	◆				14 ms	630250
800 mm	◆				14 ms	630251
900 mm	◆				14 ms	630252
1200 mm	◆				14 ms	630253

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

★ *Recommended type*

Technical documentation on the optoelectronic protective devices PSENopt:

Webcode 5197

Cable and other accessories:

From page 76

Webcode 5171

Online information at www.pilz.com

Selection guide – PSENopt

Hand protection: Type 4 – Light curtains PSEN op4H

Common features

- Compliant and approved in accordance with
  - EN/IEC 61508,
  - 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
- Function selection:
  - Via DIP switch, manual/ automatic restart
  - Feedback loop monitoring (EDM)
- Connection:
  - Receiver Rx: Connector, M12, 8-pin
  - Transmitter Tx: Connector, M12, 4-pin
- Safe semiconductor outputs: 2
- Operating range: 0.2 … 19 m
- Supply voltage: 24 VDC
- Dimensions:
  - PSENop 4H-s-30-xxx/1: 32.3 x 36.9 mm
  - Other PSENop 4H: 35 x 40 mm

PSEN op4H-s-30-090/1

Type	Resolution/ Number of beams
PSEN op4H-s-30-015/1	30 mm
PSEN op4H-s-30-030/1	30 mm
PSEN op4H-s-30-045/1	30 mm
PSEN op4H-s-30-060/1	30 mm
PSEN op4H-s-30-075/1	30 mm
★ **PSEN op4H-s-30-090/1**	30 mm
PSEN op4H-s-30-105/1	30 mm
PSEN op4H-s-30-120/1	30 mm
PSEN op4H-s-30-135/1	30 mm
PSEN op4H-s-30-150/1	30 mm
PSEN op4H-s-30-165/1	30 mm
PSEN op4H-s-30-180/1	30 mm

PSEN op4H-30-015	30 mm
PSEN op4H-30-030	30 mm
PSEN op4H-30-045	30 mm
★ **PSEN op4H-30-060**	30 mm
PSEN op4H-30-075	30 mm
PSEN op4H-30-090	30 mm
PSEN op4H-30-105	30 mm
PSEN op4H-30-120	30 mm
PSEN op4H-30-135	30 mm
PSEN op4H-30-150	30 mm
PSEN op4H-30-165	30 mm

Height of protected field	Functions				Reaction time	Order number[1]
	Muting	Blanking	Cascading			
			Master	Slave		
150 mm					9 ms	630760
300 mm					11 ms	630761
450 mm					13 ms	630762
600 mm					14 ms	630763
750 mm					16 ms	630764
900 mm					18 ms	630765
1050 mm					19 ms	630766
1200 mm					21 ms	630767
1350 mm					23 ms	630768
1500 mm					25 ms	630769
1650 mm					26 ms	630770
1800 mm					28 ms	630771
150 mm	◆				15 ms	630150
300 mm	◆				17 ms	630151
450 mm	◆				18 ms	630152
600 mm	◆				20 ms	630153
750 mm	◆				22 ms	630154
900 mm	◆				23 ms	630155
1050 mm	◆				25 ms	630156
1200 mm	◆				27 ms	630157
1350 mm	◆				28 ms	630158
1500 mm	◆				30 ms	630159
1650 mm	◆				32 ms	630160

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

★ *Recommended type*

Technical documentation on the optoelectronic protective devices PSENopt:

Webcode 5197

Cable and other accessories:

From page 76

Webcode 5171

Online information at www.pilz.com

Selection guide – PSENopt

Hand protection: Type 4 – Light curtains PSEN op4H

Common features

- Compliant and approved in accordance with
  - EN/IEC 61508,
  - 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
- Function selection:
  - Via DIP switch, manual/ automatic restart
  - Feedback loop monitoring (EDM)
- Connection:
  - Receiver Rx: Connector, M12, 8-pin
  - Transmitter Tx: Connector, M12, 4-pin
- Cascading connection:
  - Receiver Rx: Connector, M12, 5-pin
  - Transmitter Tx: Connector, M12, 5-pin
- Safe semiconductor outputs: 2
- Operating range: 0.2 … 19 m
- Supply voltage: 24 VDC
- Dimensions:
  - PSENop 4H-s-30-xxx/1: 32.3 x 36.9 mm
  - Other PSENop 4H: 35 x 40 mm

PSEN op4H-b-30-075

Type	Resolution/ Number of beams
PSEN op4H-b-30-015	30 mm
PSEN op4H-b-30-030	30 mm
PSEN op4H-b-30-045	30 mm
PSEN op4H-b-30-060	30 mm
PSEN op4H-b-30-075	30 mm
PSEN op4H-b-30-090	30 mm
PSEN op4H-b-30-105	30 mm
PSEN op4H-b-30-120	30 mm
PSEN op4H-b-30-135	30 mm
PSEN op4H-b-30-150	30 mm
PSEN op4H-b-30-165	30 mm
PSEN op4H-bm-30-015	30 mm
PSEN op4H-bm-30-030	30 mm
PSEN op4H-bm-30-045	30 mm
PSEN op4H-bm-30-060	30 mm
PSEN op4H-bm-30-075	30 mm
PSEN op4H-bm-30-090	30 mm
PSEN op4H-bm-30-105	30 mm
PSEN op4H-bm-30-120	30 mm
PSEN op4H-bm-30-135	30 mm
PSEN op4H-bm-30-150	30 mm
PSEN op4H-bm-30-165	30 mm

Height of protected field	Functions				Reaction time	Order number[1]
	Muting	Blanking	Cascading			
			Master	Slave		
150 mm		◆			16 ms	630630
300 mm		◆			20 ms	630631
450 mm		◆			23 ms	630632
600 mm		◆			25 ms	630633
750 mm		◆			27 ms	630634
900 mm		◆			30 ms	630635
1050 mm		◆			32 ms	630636
1200 mm		◆			35 ms	630637
1350 mm		◆			38 ms	630638
1500 mm		◆			40 ms	630639
1650 mm		◆			43 ms	630640
150 mm		◆	◆		16 ms	630670
300 mm		◆	◆		20 ms	630671
450 mm		◆	◆		23 ms	630672
600 mm		◆	◆		25 ms	630673
750 mm		◆	◆		27 ms	630 674
900 mm		◆	◆		30 ms	630675
1050 mm		◆	◆		32 ms	630676
1200 mm		◆	◆		35 ms	630677
1350 mm		◆	◆		38 ms	630678
1500 mm		◆	◆		40 ms	630679
1650 mm		◆	◆		43 ms	630680

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

★ *Recommended type*

Technical documentation on the optoelectronic protective devices PSENopt:

Webcode 5197

Cable and other accessories:

From page 76

Webcode 5171

Online information at www.pilz.com

Selection guide – PSENopt

Hand protection: Type 4 – Light curtains PSEN op4H

Common features

- Compliant and approved in accordance with
  - EN/IEC 61508,
  - 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
- Function selection:
  - Via DIP switch, manual/ automatic restart
  - Feedback loop monitoring (EDM)
- Connection:
  - Receiver Rx: Connector, M12, 8-pin
  - Transmitter Tx: Connector, M12, 4-pin
- Cascading connection:
  - Receiver Rx: Connector, M12, 5-pin
  - Transmitter Tx: Connector, M12, 5-pin
- Safe semiconductor outputs: 2
- Operating range: 0.2 … 19 m
- Supply voltage: 24 VDC
- Dimensions:
  - PSENop 4H-s-30-xxx/1: 32.3 x 36.9 mm
  - Other PSENop 4H: 35 x 40 mm

PSEN op4H-m-30-090

Type	Resolution/ Number of beams
PSEN op4H-m-30-015	30 mm
PSEN op4H-m-30-030	30 mm
PSEN op4H-m-30-045	30 mm
PSEN op4H-m-30-060	30 mm
PSEN op4H-m-30-075	30 mm
PSEN op4H-m-30-090	30 mm
PSEN op4H-m-30-105	30 mm
PSEN op4H-m-30-120	30 mm
PSEN op4H-m-30-135	30 mm
PSEN op4H-m-30-150	30 mm
PSEN op4H-m-30-165	30 mm
PSEN op4H-sl-30-015	30 mm
PSEN op4H-sl-30-030	30 mm
PSEN op4H-sl-30-045	30 mm
PSEN op4H-sl-30-060	30 mm
PSEN op4H-sl-30-075	30 mm
PSEN op4H-sl-30-090	30 mm
PSEN op4H-sl-30-105	30 mm
PSEN op4H-sl-30-120	30 mm
PSEN op4H-sl-30-135	30 mm
PSEN op4H-sl-30-150	30 mm
PSEN op4H-sl-30-165	30 mm

Height of protected field	Functions				Reaction time	Order number[1]
	Muting	Blanking	Cascading			
			Master	Slave		
150 mm			◆		16 ms	630650
300 mm			◆		20 ms	630651
450 mm			◆		23 ms	630652
600 mm			◆		25 ms	630653
750 mm			◆		27 ms	630654
900 mm			◆		30 ms	630655
1050 mm			◆		32 ms	630656
1200 mm			◆		35 ms	630657
1350 mm			◆		38 ms	630658
1500 mm			◆		40 ms	630659
1650 mm			◆		43 ms	630660
150 mm				◆	16 ms	630690
300 mm				◆	20 ms	630691
450 mm				◆	23 ms	630692
600 mm				◆	25 ms	630693
750 mm				◆	27 ms	630694
900 mm				◆	30 ms	630695
1050 mm				◆	32 ms	630696
1200 mm				◆	35 ms	630697
1350 mm				◆	38 ms	630698
1500 mm				◆	40 ms	630699
1650 mm				◆	43 ms	630700

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

★ *Recommended type*

Technical documentation on the optoelectronic protective devices PSENopt:

Webcode 5197

Cable and other accessories:

From page 76

Webcode 5171

Online information at www.pilz.com

Selection guide – PSENopt

Finger protection: Type 4 – Light curtains PSEN op4F

Common features

- Compliant and approved in accordance with
  - EN/IEC 61508,
  - 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
- Function selection:
  - Via DIP switch, manual/ automatic reset
  - Feedback loop monitoring
- Connection:
  - Receiver Rx: Connector, M12, 8-pin
  - Transmitter Tx: Connector, M12, 4-pin
- Safe semiconductor outputs: 2
- Operating range: 0.2 … 6 m
- Supply voltage: 24 VDC
- Dimensions:
  - PSENop 4F-s-14-xxx/1: 32.3 x 36.9 mm
  - Other PSENop 4F: 35 x 40 mm

PSEN op4F-s-14-060/1

PSEN op4F-b-14-060

Type	Resolution/ Number of beams
PSEN op4F-s-14-015/1	14 mm
PSEN op4F-s-14-030/1	14 mm
PSEN op4F-s-14-045/1	14 mm
★ **PSEN op4F-s-14-060/1**	14 mm
PSEN op4F-s-14-075/1	14 mm
PSEN op4F-s-14-090/1	14 mm
PSEN op4F-s-14-105/1	14 mm
PSEN op4F-s-14-120/1	14 mm
PSEN op4F-s-14-135/1	14 mm
PSEN op4F-s-14-150/1	14 mm
PSEN op4F-s-14-165/1	14 mm
PSEN op4F-s-14-180/1	14 mm
PSEN op4F-14-015	14 mm
PSEN op4F-14-030	14 mm
PSEN op4F-14-045	14 mm
★ **PSEN op4F-14-060**	14 mm
PSEN op4F-14-075	14 mm
PSEN op4F-14-090	14 mm
PSEN op4F-b-14-015	14 mm
PSEN op4F-b-14-030	14 mm
PSEN op4F-b-14-045	14 mm
★ **PSEN op4F-b-14-060**	14 mm
PSEN op4F-b-14-075	14 mm
PSEN op4F-b-14-090	14 mm
PSEN op4F-b-14-105	14 mm
PSEN op4F-b-14-120	14 mm

Height of protected field	Functions				Reaction time	Order number[1]
	Muting	Blanking	Cascading			
			Master	Slave		
150 mm					11 ms	630740
300 mm					15 ms	630741
450 mm					18 ms	630742
600 mm					22 ms	630743
750 mm					25 ms	630744
900 mm					29 ms	630745
1050 mm					33 ms	630746
1200 mm					36 ms	630747
1350 mm					40 ms	630748
1500 mm					43 ms	630749
1650 mm					47 ms	630750
1800 mm					50 ms	630751
150 mm	◆				18 ms	630050
300 mm	◆				22 ms	630051
450 mm	◆				26 ms	630052
600 mm	◆				31 ms	630053
750 mm	◆				35 ms	630054
900 mm	◆				40 ms	630055
150 mm		◆			21 ms	630621
300 mm		◆			28 ms	630622
450 mm		◆			35 ms	630623
600 mm		◆			41 ms	630624
750 mm		◆			48 ms	630625
900 mm		◆			55 ms	630626
1050 mm		◆			62 ms	630627
1200 mm		◆			68 ms	630628

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

★ *Recommended type*

Technical documentation on the optoelectronic protective devices PSENopt:

Webcode 5197

Cable and other accessories:

From page 76

Webcode 5171

Online information at www.pilz.com

Selection guide – PSENopt

Finger protection: Type 4 – Light curtains PSEN op4F

Common features

- Compliant and approved in accordance with
  - EN/IEC 61508,
  - 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
- Function selection:
  - Via DIP switch, manual/ automatic reset
  - Feedback loop monitoring
- Connection:
  - Receiver Rx: Connector, M12, 8-pin
  - Transmitter Tx: Connector, M12, 4-pin
- Cascading connection:
  - Receiver Rx: Connector, M12, 5-pin
  - Transmitter Tx: Connector, M12, 5-pin
- Safe semiconductor outputs: 2
- Operating range: 0.2 … 6 m
- Supply voltage: 24 VDC
- Dimensions:
  - PSENop 4F-s-14-xxx/1: 32.3 x 36.9 mm
  - Other PSENop 4F: 35 x 40 mm

PSEN op4F-bm-14-060

Type	Resolution/ Number of beams
PSEN op4F-bm-14-015	14 mm
PSEN op4F-bm-14-030	14 mm
PSEN op4F-bm-14-045	14 mm
★ **PSEN op4F-bm-14-060**	14 mm
PSEN op4F-bm-14-075	14 mm
PSEN op4F-bm-14-090	14 mm
PSEN op4F-bm-14-105	14 mm
PSEN op4F-bm-14-120	14 mm
PSEN op4F-m-14-015	14 mm
PSEN op4F-m-14-030	14 mm
PSEN op4F-m-14-045	14 mm
★ **PSEN op4F-m-14-060**	14 mm
PSEN op4F-m-14-075	14 mm
PSEN op4F-m-14-090	14 mm
PSEN op4F-m-14-105	14 mm
PSEN op4F-m-14-120	14 mm
PSEN op4F-sl-14-015	14 mm
PSEN op4F-sl-14-030	14 mm
PSEN op4F-sl-14-045	14 mm
★ **PSEN op4F-sl-14-060**	14 mm
PSEN op4F-sl-14-075	14 mm
PSEN op4F-sl-14-090	14 mm
PSEN op4F-sl-14-105	14 mm
PSEN op4F-sl-14-120	14 mm

Height of protected field	Functions				Reaction time	Order number[1]
	Muting	Blanking	Cascading			
			Master	Slave		
150 mm		◆	◆		21 ms	630661
300 mm		◆	◆		28 ms	630662
450 mm		◆	◆		35 ms	630663
600 mm		◆	◆		41 ms	630664
750 mm		◆	◆		48 ms	630665
900 mm		◆	◆		55 ms	630666
1050 mm		◆	◆		62 ms	630667
1200 mm		◆	◆		68 ms	630668
150 mm			◆		21 ms	630641
300 mm			◆		28 ms	630642
450 mm			◆		35 ms	630643
600 mm			◆		41 ms	630644
750 mm			◆		48 ms	630645
900 mm			◆		55 ms	630646
1050 mm			◆		62 ms	630647
1200 mm			◆		68 ms	630648
150 mm				◆	21 ms	630681
300 mm				◆	28 ms	630682
450 mm				◆	35 ms	630683
600 mm				◆	41 ms	630684
750 mm				◆	48 ms	630685
900 mm				◆	55 ms	630686
1050 mm				◆	62 ms	630687
1200 mm				◆	68 ms	630688

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

★ *Recommended type*

Technical documentation on the optoelectronic protective devices PSENopt:

Webcode 5197

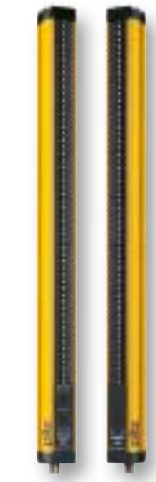
Cable and other accessories:

From page 76

Webcode 5171

Online information at www.pilz.com

Optoelectronic protective devices with S



PSENopt SB

For extensive SafetyBUS p applications

With light curtains and light grids PSENopt SB 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 Pilz **SEN**sors	Approval	Resolution	Resolution/ No. of beams	Feature/Height of protected field
Product range opSB – PSENopt SB	**4 Type 4**	B Body protection (light grid)	2 2 beams	030 300 mm
Operation ▸ Non-contact, optical, 2D (area monitoring) ▸ With SafetyBUS p interface ▸ Integral functions: Total/partial muting	Approved to EN/IEC 61496-1/-2	**H Hand protection (light curtain)**	3 3 beams	045 450 mm
		F Finger protection (light curtain)	4 4 beams	050 500 mm
			14 14 mm	060 600 mm
			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

afetyBUS p interface – PSENopt SB

Body, hand and finger protection – PSEN opSB

PSEN opSB-4B

PSEN opSB-4H

PSEN opSB-4F

	Type	Height of protected field	Reaction time	Order number [1]
	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	1200 mm	55 ms	630553
	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	1050 mm	72 ms	630456
	PSEN opSB-4H-30-120	1200 mm	75 ms	630457
	PSEN opSB-4H-30-135	1350 mm	78 ms	630458
	PSEN opSB-4H-30-150	1500 mm	81 ms	630459
	PSEN opSB-4H-30-165	1650 mm	84 ms	630460
	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

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

★ *Recommended type*

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-4B: 0.5 … 25 m
  - PSEN opSB-4H: 0.2 … 15 m
  - PSEN opSB-4F: 0.2 … 6 m
- Dimensions: 35 x 40 mm

SafetyBUS p

Technical documentation on the optoelectronic protective devices PSENopt SB:

Webcode 5202

Cable and other accessories:

From page 76

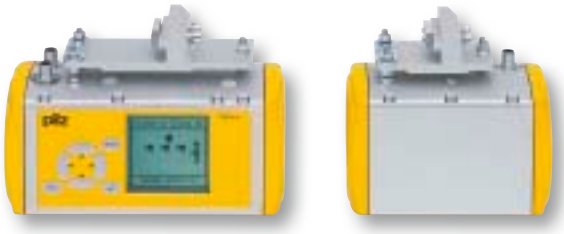
Webcode 5171

Online information at www.pilz.com

Camera-based protection and measuring

Finger protection

Bending angle is recorded



PSENvip RL D Set

Safe press braking

The camera-based protection and measuring system PSENvip is a mobile protection system. It is used to monitor press brakes safely. When installed on the upper die, the system detects 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.

Highly robust thanks to resistant technology

PSENvip is 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

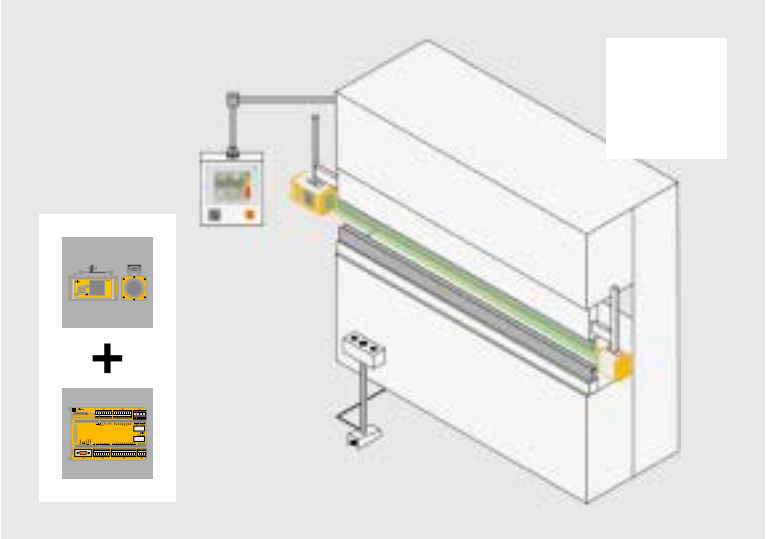
The PSENvip version with bending angle measurement records relevant control data from the bending process: the metal sheet is detected automatically and the bending angle is measured. Consistently high production quality and easy handling bring competitive advantages.

Type code for PSENvip

PSENvip RL D M Set

Product area Pilz SENsors	Transmitter/ receiver	Display (receiver)	Design (receiver)	Scope of supply
Product range vip – PSENvip	T Transmitter **RL Receiver, left**	**D With display**	_ Base version **M With bending angle measurement** P Productive version	**Set Unit comprising transmitter and receiver**
Operation Non-contact, optical, 2D (area monitoring)				

system PSENvip

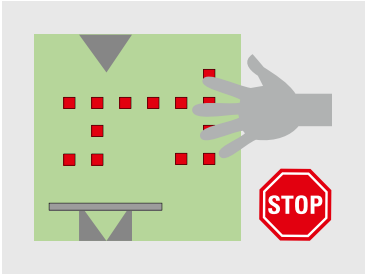


Components for your safe solution	Order number
Sensor: PSENvip RL D Set	583000
Connection: ▸ PSEN op cable, shielded, straight, M12, 4-pin, 5 m	630304
▸ PSEN op cable, shielded, straight, M12, 8-pin, 5 m	630314
Evaluation device: PNOZ m2p	773120
▸ Spring loaded terminals (1 set)	783100

The optimum solution: safe, effective press braking with the camera-based protection and measuring system PSENvip and the configurable control system PNOZmulti.

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
- Highly robust, resistant to vibration
- 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



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 the camera-based protection and measuring system PSENvip:

Webcode 5569

Online information at www.pilz.com

Productive version of PSENvip plus PSS 4000

PSENvip productive version in combination with the automation system PSS 4000.

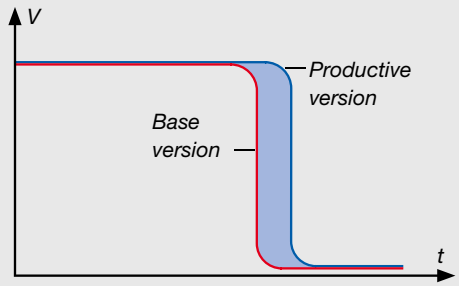
Your benefits at a glance

- Increase productivity by up to 30 % through dynamic muting mode
  - Position of the plate is checked
  - Speed is monitored
  - Approach the plate at high speed for longer
- Flexible to adapt to the respective application thanks to the wide range of I/O modules available with the control system PSSuniversal PLC
- Innovative, productive system with compatible hardware and software with TÜV concept approval
- Plus all the benefits of PSENvip (see page 67)

Productive and safe

When the productive version of PSENvip is used in combination with the automation system PSS 4000 in dynamic muting mode it is possible to increase productivity by up to 30 % compared with the base version. The control system PSSuniversal PLC performs two central tasks in this process: it monitors dynamic muting as well as the speed profile during the braking process. The functions are available as blocks in the software platform PAS4000.

As a result, it's possible to approach the plate for longer at high speed during the bending process. So the time that the upper tool travels at reduced speed is reduced to a minimum.



Bending process with productivity benefit.

Selection guide – PSENvip

Camera-based protection and measuring system PSENvip

PSENvip RL D Set

Type	Design	Trans-mitter	Receiver	Display	Order number
PSENvip RL D Set	Base version set	◆	◆	◆	583000 [1]
PSENvip RL D	Base version		◆	◆	583600
PSENvip RL D M Set	Version with bending angle measurement set	◆	◆	◆	583002 [1]
PSENvip RL D M	Version with bending angle measurement		◆	◆	583610
PSENvip RL D P Set	Productive version set	◆	◆	◆	583007 [1] [2]
PSENvip RL D P	Productive version		◆	◆	583601 [2]
PSENvip T	Transmitter	◆			583900

[1] PSENvip (sets) include: transmitter, receiver, adjustment plates, adjustment templates with magnet and a test piece
[2] In combination with the control system PSSuniversal PLC, 2 counter modules PSSu E F ABS SSI can be used

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

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

Technical documentation on the camera-based protection and measuring system PSENvip:

Webcode 5569

Cable and other accessories:

From page 76

Webcode 5171

Online information at www.pilz.com

Safe camera system SafetyEYE®

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.

SafetyEYE enables man and machine to work together safely.

The innovative 3D solution

The safe camera system SafetyEYE protects 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

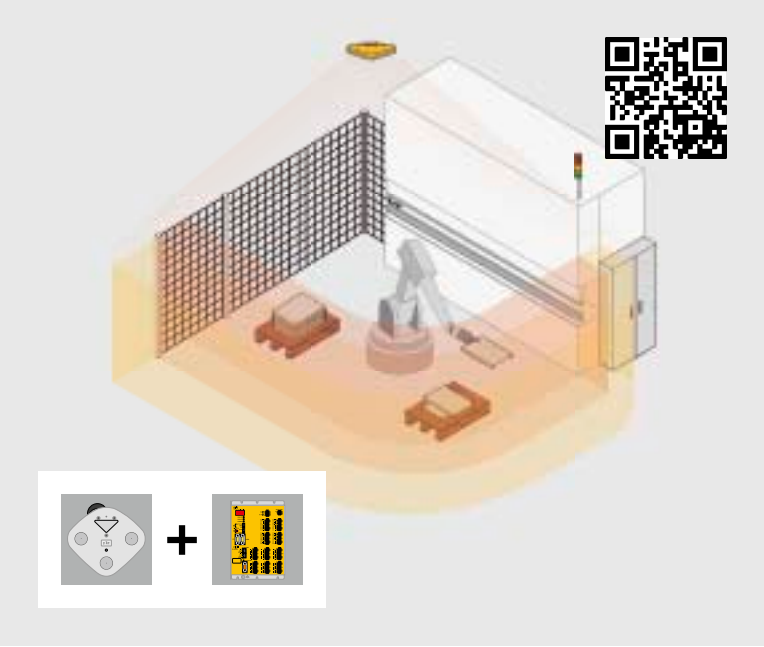
SafetyEYE detects and report objects that encroach into freely defined zones, known as warning zones and detection zones. With SafetyEYE, therefore, it is possible to determine whether there is anyone within the action radius of the hazardous movement (safety) or whether a zone with an increased safety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

Detection zones set up rapidly at the click of a mouse

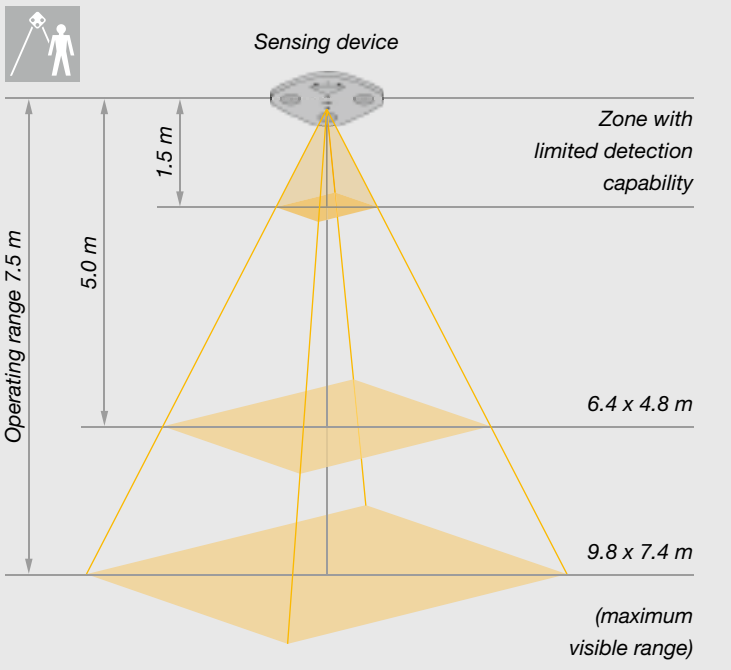
Innovative 3D technology and user-friendly software enable even complex applications to be monitored and controlled with one system.
Virtual warning and detection zones are set up intuitively using the SafetyEYE Configurator.
You define the zones, combine them into groups or switch zone arrangements to suit your needs.
This lowers your costs, reduces the number of components to a minimum and cuts expenditure on installation and engineering.



Leading technology: sensor and analysis unit combined with the programmable control system PSS.

Your benefits at a glance

- High level of safety and manipulation protection
- Economical:
  - Three-dimensional monitoring and control
  - 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 via software
  - User-friendly diagnostics, including evidence



Dimensions of the safely monitored zone

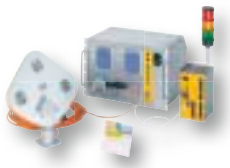
Keep up-to-date on safe camera systems SafetyEYE:

Webcode 7153

Online information at www.pilz.com

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 ▸ Maximum visible range approx. 72 m² ▸ Lighting from 300 Lux required, depending on the background ▸ Protection types: - Sensing device IP65 - Analysis unit IP20 ▸ Designed in accordance with all relevant norms and standards: - Category 3 of EN 954-1 - SIL CL 2 of EN/IEC 61508 - PL d of EN ISO 13849-1 - In accordance with DIN EN 61496 ▸ Suitable for worldwide use

Sensing device

PSEN se SU AM2 65

Type	Description
PSEN se SU AM2 65	Sensing device
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 pre-installed 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 pre-installed 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 ▸ PSEN se PA 250 ▸ PSEN se AU AM2 ▸ PSEN se AU AM2 Rear Mount ▸ PSS 3047-3 ETH-2 SE ▸ PSS ZKL 3047-3 ▸ PSEN se TO Body 140 ▸ PSEN se Cable FO2C 30	▸ PSEN se Cable ETH Patch 1 (2 cables) ▸ PSEN se Cable ETH Patch 5 ▸ CompactFlash card (2 pieces) ▸ PIT si3.1 indicator light unit ▸ PSEN se SM 6 ▸ PSEN se SM 10 ▸ PSEN se RM 6 ▸ PSEN se RM 10 ▸ 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 [4]/IP20 [5]	0 … 40 °C	110 … 240 VAC	581121 [3]
-	-	-	-	310388 [3] [6]
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

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 with the Starter Set [4] Mounting (e.g. control cabinet)
[5] Housing [6] 2 cards included when ordering an analysis unit

Technical documentation on the safe camera systems SafetyEYE:

Webcode 7153

Training – Basic SafetyEYE Course:

Webcode 4001

Cable and other accessories:

From page 76

Webcode 5171

Online information at www.pilz.com

Decentralised modules PDP67

PDP67 F 8DI ION

PDP67 F 4 code

Decentralised and passive – decentralised safety

With the PDP67 modules you can achieve a high level of decentralisation. The digital input module monitors safety functions in the field and enables up to 64 sensors to be connected (PSENmag, PSENcode, PSENini, PSENslock, PSENmech and PSENhinge).

The passive junction collects and forwards the signals and can be connected to up to four sensors (PSENcode, PSENini and PSENslock).

The ability to connect to various evaluation devices such as PNOZmulti, PNOZmulti Mini, PNOZsigma, or in future also the PSS 4000 control systems, enables a wide range of automation architectures.

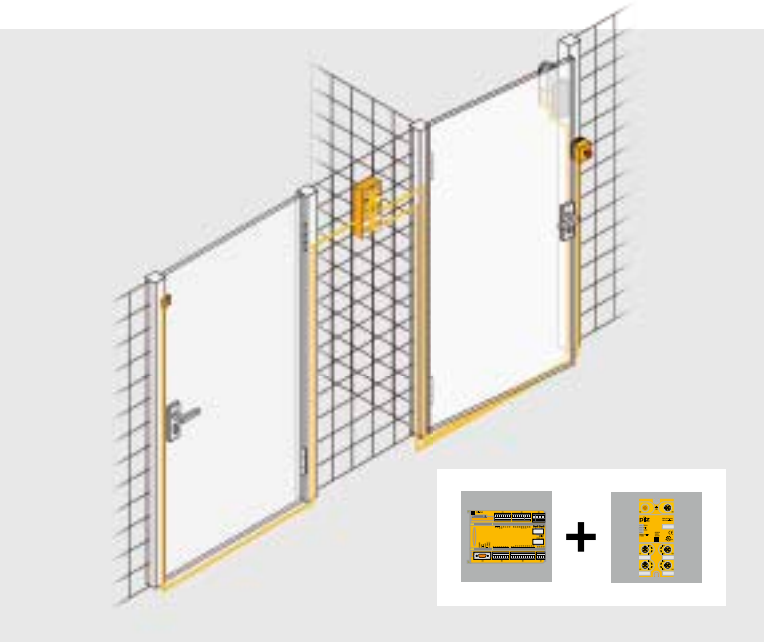
Economical and safe

Incorporated into dirt and water-repellent IP67 housing, the PDP67 modules can be used even where there are high demands on hygiene. The decentralised modules optimise the installation and wiring effort by removing the need for additional, cost-intensive hardware, such as a control cabinet for example.

Type code for decentralised modules PDP67

PDP67 F 8DI ION HP

Product area Control technology	Design	Function	Number of inputs	Technology type	Type
Product range **D**ecentralised **P**eriphery	**67** **To protection type IP67**	**F** **Failsafe**	**8DI** **8 digital inputs** 4 4 digital inputs	**ION** **I/Onet p** code PSENcode	**HP** **High Power**



The optimum solution: installed directly in the field with the decentralised modules PDP67.

Your benefits at a glance

- Simple installation means less planning, design and installation work
- Easy to implement a modular machine concept
- Just one cable for communication and supply, plug and play via M12 plug-in connector
- Simple diagnostics due to a point-to-point connection between the modules (each module can be identified)
- Individual sensors can be diagnosed on the modules

Selection guide – Modules for alternative connection options for sensors

PDP67 F 8DI ION

PDP67 F 4 code

Type	Feature	Safety	Order number
PDP67 F 8DI ION	Decentralised input module for PNOZmulti, PNOZmulti Mini and PNOZsigma	Safety data ▸ PL e of EN ISO 13849-1 ▸ SIL CL 3 of EN/IEC 62061 ▸ Cat. 4 of EN 954-1	773600
PDP67 F 8DI ION HP	Decentralised input module for PNOZmulti, PNOZmulti Mini and PNOZsigma; high power; additional supply voltage for PSENslock		773601
PDP67 F 4 code	Passive junction PSENcode		773606
PSEN Y junction M8-M12/M12	Cable separator, M8, 8-pin	-	540327
PSEN Y junction M12-M12/M12	Cable separator, M12, 8-pin	-	540328
PSEN T junction M12	Diagnostic connector, M12, 8-pin	-	540331

Keep up-to-date on decentralised modules PDP67:

Webcode 6557

Online information at www.pilz.com

Sensor technology PSEN® cable accessories

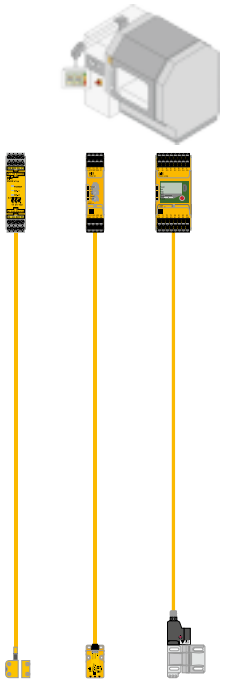
Safe, complete solutions

In addition to devices for position monitoring, safety switches, safety gate systems, optoelectronic protective devices and safe camera systems, the sensor technology product area PSEN also includes an extensive range of accessories.

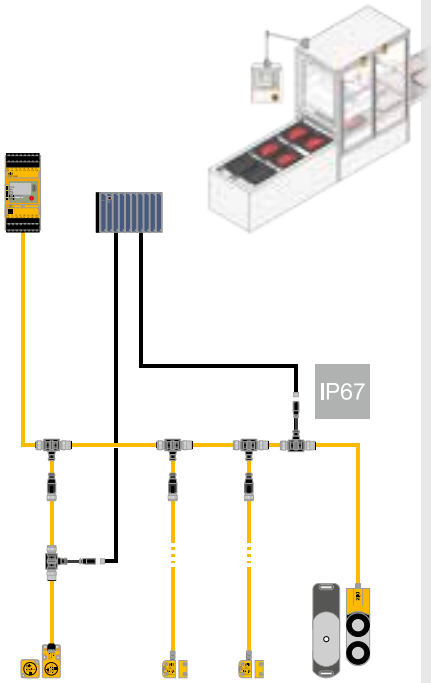
Pilz products can be connected in series and are compatible with products and interfaces from other manufacturers. They fit perfectly into your plant environment and also enable Pilz components to be retrofitted to your plant.

Select the appropriate accessories to meet your requirements and assemble your own individual system solution!

Sensor technology PSEN connected directly



Sensor technology PSEN with integrated option for series connection and 8-pin connector



PSENini

PSENcode

PSENslock

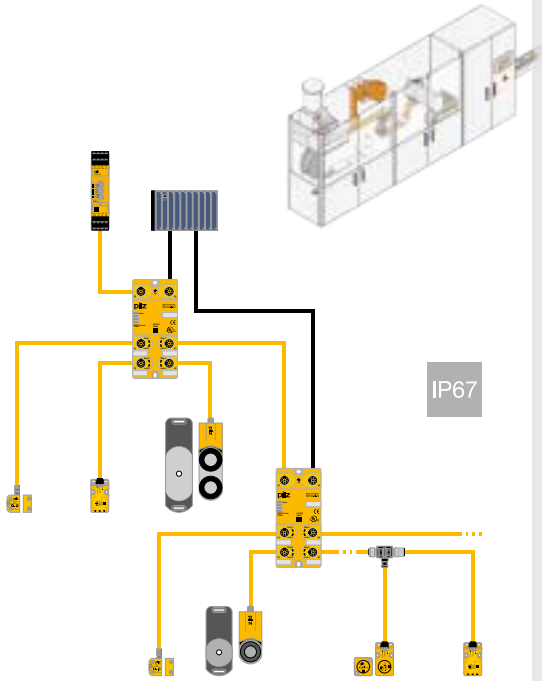
All from page 78.

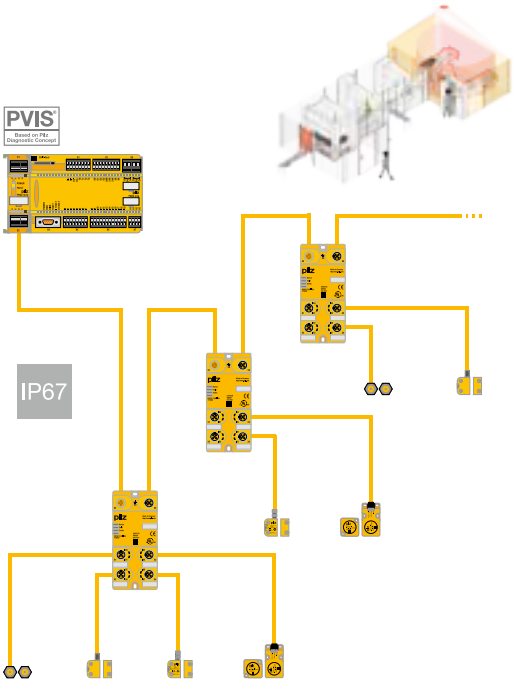
Type code for cable accessories

PSEN cable M8-8sf

Product area Pilz **SEN**sors	Diameter of thread	Number of poles	Connector design	Connector type
Cable	**M8 8 mm** M12 12 mm	4 4-pin 5 5-pin **8 8-pin**	**s Straight** a Angled	m Male **f Female**

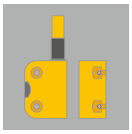
Sensor technology PSEN with 5-pin connector for PDP67 F 8DI ION and PNOZmulti





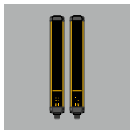
PSENmech
All from page 80.

PSENrope



PSENmag
From page 82

PSENhinge
From page 84



PSENopt
From page 86

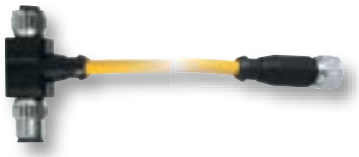
Selection guide – Cable for PSENini, PSEN

PSENini, PSENcode and PSENslock – Cable selection for connection to any evaluation device

PSEN cable M8-8sf

Type	Description	Features Connection 1
PSEN cable M8-8sf	Cable for connection to any evaluation device	Straight, M8, 8-pin, socket
PSEN cable M12-8sf		Straight, M12, 8-pin, socket
PSEN cable M12-8af		Angled, M12, 8-pin, socket
PSEN cable M12-5sf		Straight, M12, 5-pin, socket
PSEN cable M12-5af		Angled, M12, 5-pin, socket

PSENini, PSENcode and PSENslock – Cable selection for series connection



PSEN Y junction M12-M12/M12

PSEN cable M8-8sf M8-8sm

Type	Description
PSEN Y junction M8-M12/M12	Cable separator
PSEN Y junction M12-M12/M12	Cable separator
PSEN T junction M12	Diagnostic connector
PSEN cable M8-8sf M8-8sm	Extension cable
PSEN cable M8-8sf M8-8sm	Extension cable
PSEN cable M8-8sf M8-8sm	Extension cable
PSEN cable M12-8sf	Cable

PSENini, PSENcode and PSENslock – Cable selection for connection to PDP67 F 4 code

PSEN cable M12-8sf

PDP67 F 4 code

Type	Description	Features Connection 1
PSEN cable M12-8sf M12-8sm	Cable for connection to PDP67 F 4 code	Straight, M12, 8-pin, socket
PSS67/PDP67 cable M12-8sm	Cable for connection to any evaluation device	Straight, M12, 8-pin, plug

Type	Description
PDP67 F 4 code	Passive junction for PSENcode

code and PSENslock

	Order number (by length)					
Connection 2	**2 m**	**3 m**	**5 m**	**10 m**	**20 m**	**30 m**
Open cable	533150	-	533151	533152	533153	533154
	-	540319	540320	540321	540333	540326
	-	540322	540323	540324	-	540325
	-	630310	630311	630312	630298	630297
	-	630347	630348	630349	-	630350

Features	**Order number**
Series connection PSEN cs3.xx/PSEN cs4.xx with M8 plug, 8-pin	540327
Series connection PSENcode, PSENini, PSENslock with M12 plug, 8-pin	540328
▸ PSENini, PSENcode, PSENslock: Signal output ▸ PSENslock: Lock signal	540331
0.5 m, straight, M8, 8-pin, plug/socket	533155
1 m, straight, M8, 8-pin, plug/socket	533156
2 m, straight, M8, 8-pin, plug/socket	533157
5 m (see table below for additional cable lengths)	540341

	Order number (by length)					
Connection 2	**2 m**	**3 m**	**5 m**	**10 m**	**20 m**	**30 m**
Straight, M12, 8-pin, plug	540340	-	540341	540342	540343	540344
Open cable	380700	-	380701	380702	380703	380704

Features	**Order number**
▸ 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	773603

Selection guide – Cable for PSENini, PSENc

PSENini, PSENcode and PSENslock – Cable selection for connection to PDP67 F 8DI ION/PSS67

PSS67/PDP67 cable M12-5sf

Type	Description	Features Connection 1
PSS67/PDP67 cable M12-5sf M12-5sm	Cable for connection to PDP67 F 8DI ION/ PSS67	Straight, M12, 5-pin, socket
PSS67/PDP67 cable M12-5af M12-5am		Angled, M12, 5-pin, socket

PDP67 F 8DI ION

Type	Description
PDP67 F 8DI ION	Sensor junction box for decentralised periphery PNOZmulti

PSENmech and PSENrope – Cable selection for connection to PDP67 F 8DI ION/PSS67

PSS67/PDP67 cable

Type	Description	Features Connection 1
PSS67/PDP67 cable	Cable for connection to PDP67 F 8DI ION/ PSS67	Open cable

PDP67 F 8DI ION

Type	Description
PDP67 F 8DI ION	Sensor junction box for decentralised periphery PNOZmulti

ode, PSENslock, PSENmech and PSENrope

	Order number (by length)					
Connection 2	**2 m**	**3 m**	**5 m**	**10 m**	**20 m**	**30 m**
Straight, M12, 5-pin, plug	-	380208	380209	380210	380220	380211
Angled, M12, 5-pin, plug	-	380212	380213	380214	-	380215

Features	**Order number**
Multiple interface PDP67, protection type IP67, PL e of EN ISO 13849-1, SIL CL 3 of EN/IEC 62061 and Cat. 4 of EN 954-1	773600

	Order number (by length)					
Connection 2	**2 m**	**3 m**	**5 m**	**10 m**	**20 m**	**30 m**
Straight, M12, 5-pin, plug	-	380705	-	380706	380707	380708

Features	**Order number**
Multiple interface PDP67, protection type IP67, PL e of EN ISO 13849-1, SIL CL 3 of EN/IEC 62061 and Cat. 4 of EN 954-1	773600

Selection guide – Cable for PSENmag

PSENmag – Cable selection for connection to any evaluation device

PSEN cable M8-4sf

Type	Description	Features Connection 1
PSEN cable M8-4sf	Cable for connection to any evaluation device	Straight, M8, 4-pin, socket
PSEN cable M8-4af		Angled, M8, 4-pin, socket
PSEN cable M8-8sf		Straight, M8, 8-pin, socket
PSEN cable M12-8sf		Straight, M12, 8-pin, socket
PSEN cable M12-8af		Angled, M12, 8-pin, socket
PSEN cable M12-5sf		Straight, M12, 5-pin, socket

PSENmag – Accessory selection for series connection

Type	Description
PSEN ix1	Multiple interface (PSEN 1 series), IP20 protection type
PSEN i1	Multiple interface (PSEN 2 series), IP20 protection type

PSENmag – Cable selection for connection to PDP67 F 8DI ION/PSS67

PSS67/PDP67 cable M12-5sf

Type	Description	Features Connection 1
PSS67/PDP67 cable M12-5sf	Cable for connection to PDP67 F 8DI ION/ PSS67	Straight, M12, 5-pin, socket
PSS67/PDP67 cable M12-5af		Angled, M12, 5-pin, socket
PSS67/PDP67 cable M8-4sf [1]		Straight, M8, 4-pin, socket
PSS67/PDP67 cable M8-4af [1]		Angled, M8, 4-pin, socket

PDP67 F 8DI ION

Type	Description
PDP67 F 8DI ION	Sensor junction box for decentralised periphery PNOZmulti

	Order number (by length)					
Connection 2	**2 m**	**3 m**	**5 m**	**10 m**	**20 m**	**30 m**
Open cable	533111	-	533121	533131	-	533141
	533110	-	533120	533130	-	533140
	533150	-	533151	533152	533153	533154
	-	540319	540320	540321	540333	540326
	-	540322	540323	540324	-	540325
	-	630310	630311	630312	630298	630297

Features	**Order number**
▸ Series connection up to PL c of EN ISO 13849-1, SIL CL 1 of EN/IEC 62061 and Cat. 2 of EN 954-1 ▸ Can be used for connection to: PNOZsigma, PNOZpower, PNOZ X, PNOZmulti, PSS	535120
▸ Series connection up to PL c of EN ISO 13849-1, SIL CL 1 of EN/IEC 62061 and Cat. 2 of EN 954-1 ▸ Can be used for connection to: PNOZelog, PNOZmulti, PSS	535110

	Order number (by length)					
Connection 2	**2 m**	**3 m**	**5 m**	**10 m**	**20 m**	**30 m**
Straight, M12, 5-pin, plug	-	380208	380209	380210	380220	380211
Angled, M12, 5-pin, plug	-	380212	380213	380214	-	380215
Straight, M12, 5-pin, plug	-	380200	380201	380202	-	380203
Angled, M12, 5-pin, plug	-	380204	380205	380206	-	380207

[1] An adapter is also required, order number: 380300

Features	**Order number**
Multiple interface PDP67, protection type IP67, PL e of EN ISO 13849-1, SIL CL 3 of EN/IEC 62061 and Cat. 4 of EN 954-1	773600

Selection guide – Cable for PSENhinge

PSENhinge – Cable selection for connection to any evaluation device

PSEN cable M12-4sf

Type	Description	Features Connection 1
PSEN cable M12-4sf	Cable for connection to any evaluation device	Straight, M12, 4-pin, socket
PSEN cable M12-5sf		Straight, M12, 5-pin, socket
PSEN cable M12-5af		Angled, M12, 5-pin, socket

PSENhinge – Cable selection for connection to PDP67 F 8DI ION/PSS67

PSS67/PDP67 cable M12-5sf

PSS67/PDP67 cable M12-5sf [1)]	Cable for connection to PDP67 F 8DI ION/ PSS67	Straight, M12, 5-pin, socket
PSS67/PDP67 cable M12-5af [1)]		Angled, M12, 5-pin, socket

PDP67 F 8DI ION

Type	Description
PDP67 F 8DI ION	Sensor junction box for decentralised periphery PNOZmulti

	Order number (by length)				
Connection 2	**3 m**	**5 m**	**10 m**	**20 m**	**30 m**
Open cable	630300	630301	630302	-	630296
	630310	630311	630312	630298	630297
	630347	630348	630349	-	630350

Straight, M12, 5-pin, plug	380208	380209	380210	380220	380211
Angled, M12, 5-pin, plug	380212	380213	380214	-	380215

[1] An adapter is also required, order number: 380300

Features	**Order number**
Multiple interface PDP67, protection type IP67, PL e of EN ISO 13849-1, SIL CL 3 of EN/IEC 62061 and Cat. 4 of EN 954-1	773600

Selection guide – Cable for PSENopt

PSENopt – Cable selection for connection to any evaluation device

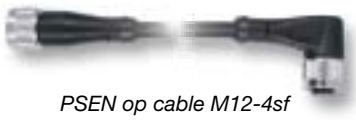
PSEN op cable M12-4sf

PSEN op cable M12-5af

Type	Description	Features Connection 1
PSEN op cable M12-4sf	Cable for type 2 light grid, for connection to any evaluation device	Unshielded, straight, M12, 4-pin, socket
PSEN op cable M12-4af		Unshielded, angled, M12, 4-pin, socket
PSEN op cable M12-5sf		Unshielded, straight, M12, 5-pin, socket
PSEN op cable M12-5af		Unshielded, angled, M12, 5-pin, socket
PSEN op cable M12-4sf shielded	Cable for type 4 light grid, for connection to any evaluation device	Shielded, straight, M12, 4-pin, socket
PSEN op cable M12-4af shielded		Shielded, angled, M12, 4-pin, socket
PSEN op cable M12-8sf shielded		Shielded, straight, M12, 8-pin, socket
PSEN op cable M12-8af shielded		Shielded, angled, M12, 8-pin, socket

PSENopt – Accessory selection for cascadable light grids

PSEN op connector M12-5f



PSEN op cable M12-4sf

Type	Description	Features Connection 1
PSEN op connector M12-5f	M12 coupling sockets, for cascade master in standalone mode	M12, 5-pin, socket
PSEN op cable axial M12-5sf shielded	Cable for cascading	Shielded, straight, M12, 5-pin, socket
PSEN op cable M12-4sf shielded	Cable for L-Muting	Shielded, straight, M12, 4-pin, socket
PSEN op cableset M12-4sf shielded	Y-cable for T-Muting	Shielded, straight, M12, 4-pin, socket

	Order number (by length)			
Connection 2	**3 m**	**5 m**	**10 m**	**30 m**
Open cable	630300	630301	630302	630296
	630341	630342	630343	630344
	630310	630311	630312	630297
	630347	630348	630349	630350
	630303	360304	630305	630309
	630306	630307	630308	630319
	630313	630314	630315	630328
	630316	630317	630318	630329

	Order number (by length)		
Connection 2	**0.5 m**	**0.75 m**	**1 m**
-	630285	-	-
Shielded, straight, M12, 5-pin, socket	630280	-	630281
Shielded, angled, M12, 4-pin, socket	-	630282	-
2 connections: shielded, angled, M12, 4-pin, socket	630295	-	-

Selection guide – Cable accessories for se

Sensor technology PSEN – Accessory selection for self-assembly plugs and sockets

PSEN/PDP67 M12-8sf screw terminals

PSEN/PDP67 M12-8sm screw terminals

Type	Description	Features Connection 1
PSS67 M12 connector M12-5sf	Female connector	Straight, M12, socket
PSS67 M12 connector M12-5sm	Male connector	Straight, M12, plug
PSS67 M12 connector M12-5af	Female connector	Angled, M12, socket
PSS67 M12 connector M12-5am	Male connector	Angled, M12, plug
PSEN/PDP67 M12-8sf screw terminals	Female connector	Straight, M12, socket
PSEN/PDP67 M12-8sm screw terminals	Male connector	Straight, M12, plug

Connection 2	Order number
Screw terminal suitable for 5-core cable, max. 0.75 mm²	380309
	380308
	380311
	380310
Screw terminal suitable for 8-core cable, max. 0.5 mm²	540332
	540334

Selection guide – Accessories PSENrope, PSEN

Accessories PSENrope

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

Accessories PSENmech

PSEN screw

One-way screw to secure the actuator	▸ Stainless steel ▸ Drive: One-way slot (safety screw)		
PSEN screw M4x16	▸ M4, 16 mm ▸ Suitable for PSEN me1x/1AS and PSEN me4	10	540310
PSEN screw M5x20	▸ M5, 20 mm ▸ Suitable for PSEN me1x/1AR, PSEN me2 and PSEN me3	10	540312

mech, PSENcode, PSENhinge and PSENslock

Accessories PSENcode

PSEN screw

Description Type	Features	Quantity	Order number
One-way screw to secure the actuator	▸ Stainless steel ▸ Drive: One-way slot (safety screw)		
PSEN screw M5x10	▸ M5, 10 mm ▸ Suitable for PSEN cs1.x and PSEN cs2.x	10	540311
PSEN screw M5x20	▸ M5, 20 mm ▸ Suitable for PSEN cs1.x and PSEN cs2.x	10	540312

Accessories PSENhinge

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

Accessories PSENslock

PSEN screw

One-way screw to secure the actuator	▸ Stainless steel ▸ Drive: One-way slot (safety screw)		
PSEN screw M5x20	▸ M5, 20 mm ▸ Suitable for PSEN sl-x	10	540312
Mounting bracket **PSEN sl bracket sliding door**	For sliding gates	2	570551
PSEN sl bracket swing door	For swing gates	1	570550

Selection guide – Accessories PSENopt

Accessories PSENopt - Body protection

PSEN op67-69K-2-050

Description Type	Features/Length	Quantity	Order number
IP67/IP69K protective housing [1] for light grids			
PSEN op67-69K-2-050	50 cm	1	630942
PSEN op67-69K-3-080	80 cm	1	630943
PSEN op67-69K-4-090	90 cm	1	630944
PSEN op67-69K-4-120	120 cm	1	630945
Front protection			
PSEN op Lens Shield-2-050	50 cm	1	630922
PSEN op Lens Shield-3-080	80 cm	1	630923
PSEN op Lens Shield-4-090	90 cm	1	630924
PSEN op Lens Shield-4-120	120 cm	1	630925

[1] *Application: one light grid per protective housing*

Accessories PSENopt – Hand and finger protection

PSEN op67-69K-060/1

PSEN op Lens Shield-015/1

Description Type	Features/Length	Quantity	Order number
IP67/IP69K protective housing [1] for light grids			
PSEN op67-69K-015/1	15 cm	1	630930
PSEN op67-69K-030/1	30 cm	1	630931
PSEN op67-69K-045/1	45 cm	1	630932
PSEN op67-69K-060/1	60 cm	1	630933
PSEN op67-69K-075/1	75 cm	1	630934
PSEN op67-69K-090/1	90 cm	1	630935
PSEN op67-69K-105/1	105 cm	1	630936
PSEN op67-69K-120/1	120 cm	1	630937
PSEN op67-69K-135/1	135 cm	1	630938
PSEN op67-69K-150/1	150 cm	1	630939
PSEN op67-69K-165/1	165 cm	1	630940
PSEN op67-69K-180/1	180 cm	1	630941
Front protection			
PSEN op Lens Shield-015/1	15 cm	1	630910
PSEN op Lens Shield-030/1	30 cm	1	630911
PSEN op Lens Shield-045/1	45 cm	1	630912
PSEN op Lens Shield-060/1	60 cm	1	630913
PSEN op Lens Shield-075/1	75 cm	1	630914
PSEN op Lens Shield-090/1	90 cm	1	630915
PSEN op Lens Shield-105/1	105 cm	1	630916
PSEN op Lens Shield-120/1	120 cm	1	630917
PSEN op Lens Shield-135/1	135 cm	1	630918
PSEN op Lens Shield-150/1	150 cm	1	630919
PSEN op Lens Shield-165/1	165 cm	1	630920
PSEN op Lens Shield-180/1	180 cm	1	630921

[1] *Application: one light grid per protective housing*

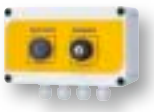
Selection guide – Accessories PSENopt

Accessories PSENopt – Body, hand and finger protection

PSEN op bracket turnable (kit)

PSEN op Testpiece

Laser pointer for PSEN 4/2



PSEN iop 1

Description Type	Features	Quantity	Order number
Mounting bracket			
PSEN op Bracket	Suitable for muting sensors	1	630324
PSEN op Bracket kit	▸ Suitable for all PSENopt except PSEN op2H ▸ Profile: 30 x 30 mm	4	630325 [1]
PSEN op Bracket kit adjustable	▸ Adjustable ▸ Profile: 30 x 30 mm	4	630326
PSEN op Bracket kit antivibration	▸ Vibration-resistant ▸ Profile: 30 x 30 mm	4	630327
PSEN op bracket turnable (kit)	▸ Suitable for PSEN op…/1, rotatable and adjustable ▸ Profile: 30 x 30 mm	4	630772 [2]
Test rods	For regular function test		
PSEN op Testpiece F 14mm	Finger protection, ø 14 mm	1	630345
PSEN op Testpiece H 30mm	Hand protection, ø 30 mm	1	630346
Alignment guide **Laser pointer for PSEN 4/2**	Laser protection class 2 in accordance with EN 60825-1	1	630340
Junction box **PSEN iop 1**	Suitable for PSEN op4B-T/-L/-S	1	630370

[1] Included with the PSENopt
[2] Included with the PSEN op…/1

Accessories PSENopt – Access protection (1 beam)

Description Type	Features	Quantity	Order number
Deviating mirror **PSEN 2S/4S mirror**	Suitable for light beam devices PSEN op2S/4S	1	630711
Mounting bracket **PSEN 2S/4S bracket**	Suitable for light beam devices PSEN op2S/4S	2	630712

Accessories PSENopt – Muting

PIT si 1.1

Description Type	Features	Quantity	Order number
Signal lamp for muting mode	▸ Operating range: 0.1 … 3 m ▸ Protection type: IP65 ▸ Supply voltage: 24 VDC		
PIT si 1.1	▸ Unmonitored in accordance with EN/IEC 61496 ▸ 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 ▸ 2 semiconductor outputs to monitor the function of the filament ▸ TÜV approval	1	620020
PIT si 2.1	▸ Unmonitored in accordance with EN/IEC 61496 and VDE 0113-201 ▸ TÜV approval ▸ Incl. LED, mounting bracket and 2 screws ▸ Service life up to 50000 hours	1	620015

Selection guide – Accessories PSENopt, P

Accessories PSENopt – Muting

PSEN op1.1

Description Type	Features	Quantity	Order number
Muting sensors	▸ Output: PNP, N/O and N/C ▸ Supply voltage: 10 … 30 VDC ▸ Connection: Male connector, M12, 4-pin		
PSEN op1.2 Emitter M12	Transmitter: ▸ Suitable for PSEN op4, PSEN op2B ▸ Operating range: 0 … 20 m	1	630322
PSEN op1.1 Receiver pnp no/nc M12	Receiver: ▸ Suitable for PSEN op4, PSEN op2B ▸ Operating range: 0 … 20 m	1	630321
PSEN op1.3 Reflex pnp no/nc M12	Reflex: ▸ Suitable for PSEN op2B, PSEN op4, PSEN opSB ▸ With prism reflector ▸ Operating range: 0.1 … 6 m	1	630320
PSEN op Reflector	Reflector: ▸ Suitable for PSEN op2B, PSEN op4, PSEN opSB ▸ With prism reflector ▸ Operating range: 0.1 … 6 m	1	630323
PSEN op1.4 L-Reflex	Reflex: Suitable for L-configuration on PSEN op4B-S-x-xxx	1	630707
PSEN op1.5 L-Reflector	Reflector: Suitable for L-configuration on PSEN op4B-S-x-xxx	1	630708
PSEN op1.6 T-Reflex	Reflex: Suitable for T-configuration on PSEN op4B-S-x-xxx	1	630709

SENvip and SafetyEYE®

Accessories PSENvip

PSENvip MS

PSENvip AT mag

PSENvip TP

Description Type	Features	Quantity	Order number
Adapter plate **PSENvip MB**	To mount the PSENvip AP on to any bracket, with slot	2	583205
Retaining brackets **PSENvip MS**	Retaining brackets (set) for installation	2	583206
Adjustment plates **PSENvip AP**	For PSENvip, transmitter and receiver	2	583202 [1)]
Adjustment templates			
PSENvip AT mag	With magnet to align PSENvip on a first-time installation	2	583203 [1)]
PSENvip AT mech	For mechanical installation in the tool holder on a first-time installation	2	583204
Test piece **PSENvip TP**	For regular function test, finger protection	1	583200 [1)]

[1)] Included with the PSENvip (set)

Accessories SafetyEYE

PSEN se PA 250

CompactFlash Karte

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

[2)] Included with the SafetyEYE Starter Set

[3)] 2 cards included with the SafetyEYE Starter Set

[4)] 2 cards included when ordering an analysis unit

Selection guide – Accessories SafetyEYE®

Accessories SafetyEYE

PSEN se Cable FO2C

PSEN se SM 10/
PSEN se RM 10

SafetyEYE
Configurator

PIT si3.1

Description Type	Features	Quantity	Order number
Cable for data and supply voltage **PSEN se Cable FO2C**	To connect the sensing device to the analysis unit: FOC for data, copper cables for 12 V supply voltage	1	15 m .....581 122 30 m .....581 123 [1] 50 m .....581 124 80 m 581 125
Ethernet connection cable **PSEN se Cable ETH Patch**	To connect the analysis unit to the programmable control system or configuration PC, shielded	1	1 m .....581 112 [2] 5 m .....581 111 [1]
Setup markers	Depends on the distance between sensing device and user plane		
PSEN se SM 6	1 … 6 m	5	581 160 [3]
PSEN se SM 10	4 … 10 m	5	581 161 [3]
Reference markers	Depends on the distance between sensing device and user plane		
PSEN se RM 6	1 … 5 m	6	581 170 [3]
PSEN se RM 10	4 … 9 m	6	581 171 [3]
Software			
SafetyEYE Assistant and Configurator, base licence	Basic licence for the SafetyEYE Assistant and Configurator	1	581 250B [3]
SafetyEYE Assistant and Configurator CD	CD containing the configuration software SafetyEYE Assistant and Configurator	1	581 250D [3]
SafetyEYE Assistant and Configurator CD, documentation	CD containing configuration software for SafetyEYE Assistant and Configurator, plus SafetyEYE documentation	1	581 250
SafetyEYE Assistant and Configurator, copy licence	Copy licence for the SafetyEYE Assistant and Configurator	1	581 250K
Indicator light unit **PIT si3.1 indicator light unit**	▸ Red, amber, green ▸ Supply voltage: 24 VDC	1	581 190 [3]
Test piece **PSEN se TO Body 140**	For regular function test, body protection, ø 140 mm	1	581 182 [3]

[1] 1 cable included in the SafetyEYE Starter Set (2nd generation)
[2] 2 cables included in the SafetyEYE Starter Set (2nd generation)
[3] Included in the SafetyEYE Starter Set

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AT
Pilz Ges.m.b.H.
Sichere Automation
Modecenterstraße 14
1030 Wien
Austria
Telephone: +43 1 7986263-0
Telefax: +43 1 7986264
E-Mail: pilz@pilz.at
Internet: www.pilz.at

AU
Pilz Australia
Safe Automation
Unit D7, Hallmarc Business park Clayton
Corner of Westall and Centre roads
Clayton, Melbourne, Victoria 3168
Australia
Telephone: +61 3 95446300
Telefax: +61 3 95446311
E-Mail: safety@pilz.com.au
Internet: www.pilz.com.au

BE LU
Pilz Belgium
Safe Automation
Bijenstraat 4
9051 Gent (Sint-Denijs-Westrem)
Belgium
Telephone: +32 9 3217570
Telefax: +32 9 3217571
E-Mail: info@pilz.be
Internet: www.pilz.be

BR
Pilz do Brasil
Automação Segura
Rua Ártico, 123 - Jd. do Mar
09726-300
São Bernardo do Campo - SP
Brazil
Telephone: +55 11 4126-7290
Telefax: +55 11 4126-7291
E-Mail: pilz@pilz.com.br
Internet: www.pilz.com.br

CH
Pilz Industrieelektronik GmbH
Gewerbepark Hintermättli
Postfach 6
5506 Mägenwil
Switzerland
Telephone: +41 62 88979-30
Telefax: +41 62 88979-40
E-Mail: pilz@pilz.ch
Internet: www.pilz.ch

CN
Pilz Industrial Automation
Trading (Shanghai) Co., Ltd.
Rm. 1702-1704
Yongda International Tower
No. 2277 Long Yang Road
Shanghai 201204
China
Telephone: +86 21 60880878
Telefax: +86 21 60880870
E-Mail: sales@pilz.com.cn
Internet: www.pilz.com.cn

DE
Pilz GmbH & Co. KG
Felix-Wankel-Straße 2
73760 Ostfildern
Germany
Telephone: +49 711 3409-0
Telefax: +49 711 3409-133
E-Mail: pilz.gmbh@pilz.de
Internet: www.pilz.de

DK
Pilz Skandinavien K/S
Safe Automation
Ellegaardvej 25 L
6400 Sonderborg
Denmark
Telephone: +45 74436332
Telefax: +45 74436342
E-Mail: pilz@pilz.dk
Internet: www.pilz.dk

ES
Pilz Industrieelektronik S.L.
Safe Automation
Camí Ral, 130
Polígono Industrial Palou Nord
08401 Granollers
Spain
Telephone: +34 938497433
Telefax: +34 938497544
E-Mail: pilz@pilz.es
Internet: www.pilz.es

FI
Pilz Skandinavien K/S
Safe Automation
Nuijamiestentie 7
00400 Helsinki
Finland
Telephone: +358 10 3224030
Telefax: +358 9 27093709
E-Mail: pilz.fi@pilz.dk
Internet: www.pilz.fi

FR
Pilz France Electronic
1, rue Jacob Mayer
BP 12
67037 Strasbourg Cedex 2
France
Telephone: +33 3 88104000
Telefax: +33 3 88108000
E-Mail: siege@pilz-france.fr
Internet: www.pilz.fr

GB
Pilz Automation Technology
Safe Automation
Willow House, Medlicott Close
Oakley Hay Business Park
Corby
Northants NN18 9NF
United Kingdom
Telephone: +44 1536 460766
Telefax: +44 1536 460866
E-Mail: sales@pilz.co.uk
Internet: www.pilz.co.uk

IE
Pilz Ireland Industrial Automation
Cork Business and Technology Park
Model Farm Road
Cork
Ireland
Telephone: +353 21 4346535
Telefax: +353 21 4804994
E-Mail: sales@pilz.ie
Internet: www.pilz.ie

IN
Pilz India Pvt Ltd
Office No 202, Delite Square
Near Aranyeshwar Temple
Sahakar Nagar No 1
Pune 411009
India
Telephone: +91 20 2421399-4/-5
Telefax: +91 20 2421399-6
E-Mail: info@pilz.in
Internet: www.pilz.in

IT
Pilz Italia Srl
Automazione sicura
Via Meda 2/A
22060 Novedrate (CO)
Italy
Telephone: +39 031 789511
Telefax: +39 031 789555
E-Mail: info@pilz.it
Internet: www.pilz.it

JP
Pilz Japan Co., Ltd.
Safe Automation
Shin-Yokohama Fujika Building 5F
2-5-9 Shin-Yokohama
Kohoku-ku
Yokohama 222-0033
Japan
Telephone: +81 45 471-2281
Telefax: +81 45 471-2283
E-Mail: pilz@pilz.co.jp
Internet: www.pilz.jp

KR
Pilz Korea Ltd.
Safe Automation
9F Jo-Yang Bld. 50-10
Chungmuro2-Ga Jung-Gu
100-861 Seoul
Republic of Korea
Telephone: +82 2 2263 9541
Telefax: +82 2 2263 9542
E-Mail: info@pilzkorea.co.kr
Internet: www.pilzkorea.co.kr

MX
Pilz de México, S. de R.L. de C.V.
Automatización Segura
Convento de Actopan 36
Jardines de Santa Mónica
Tlalnepantla, Méx. 54050
Mexico
Telephone: +52 55 5572 1300
Telefax: +52 55 5572 1300
E-Mail: info@pilz.com.mx
Internet: www.pilz.mx

NL
Pilz Nederland
Veilige automatisering
Postbus 186
4130 ED Vianen
Netherlands
Telephone: +31 347 320477
Telefax: +31 347 320485
E-Mail: info@pilz.nl
Internet: www.pilz.nl

NZ
Pilz New Zealand
Safe Automation
Unit 4, 12 Laidlaw Way
East Tamaki
Auckland 2016
New Zealand
Telephone: +64 9 6345350
Telefax: +64 9 6345352
E-Mail: office@pilz.co.nz
Internet: www.pilz.co.nz

...
In many countries we are represented by sales partners.

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

PL
Pilz Polska Sp. z o.o.
Safe Automation
ul. Marywilska 34H
03-231 Warszawa
Poland
Telephone: +48 22 8847100
Telefax: +48 22 8847109
E-Mail: info@pilz.pl
Internet: www.pilz.pl

PT
Pilz Industrieelektronik S.L.
R. Eng Duarte Pacheco, 120
4 Andar Sala 21
4470-174 Maia
Portugal
Telephone: +351 229407594
Telefax: +351 229407595
E-Mail: pilz@pilz.pt
Internet: www.pilz.pt

RU
Pilz RUS OOO
Ugreshskaya street, 2,
bldg. 11, office 16 (1st floor)
115088 Moscow
Russian Federation
Telephone: +7 495 665 4993
E-Mail: pilz@pilzrussia.ru
Internet: www.pilzrussia.ru

SE
Pilz Skandinavien K/S
Safe Automation
Energigatan 10 B
43437 Kungsbacka
Sweden
Telephone: +46 300 13990
Telefax: +46 300 30740
E-Mail: pilz.se@pilz.dk
Internet: www.pilz.se

TR
Pilz Emniyet Otomasyon
Ürünleri ve Hizmetleri Tic. Ltd. Şti.
Kayışdağı Cd. Beykonağı Plaza
No:130 K:2 D:2
Ataşehir/İstanbul
Turkey
Telephone: +90 216 5775550
Telefax: +90 216 5775549
E-Mail: info@pilz.com.tr
Internet: www.pilz.com.tr

US CA
Pilz Automation Safety L.P.
7150 Commerce Boulevard
Canton
Michigan 48187
USA
Telephone: +1 734 354 0272
Telefax: +1 734 354 3355
E-Mail: info@pilzusa.com
Internet: www.pilz.us

Technical support
+49 711 3409-444
support@pilz.com

Pilz GmbH & Co. KG
Felix-Wankel-Straße 2
73760 Ostfildern, Germany
Telephone: +49 711 3409-0
Telefax: +49 711 3409-133
E-Mail: pilz.gmbh@pilz.de
Internet: www.pilz.com

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