

PSEN op2.1 L-/ 2.2 T-Muting Set

pilz

PSEN sensor technology

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SD means Secure Digital

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Introduction

Validity of documentation

This documentation is valid for the product PSEN op2.1 L-Muting Set. It is valid until new documentation is published.

This operating manual explains the function and operation, describes the installation and provides guidelines on how to connect the product.

Using the documentation

This document is intended for instruction. Only install and commission the product if you have read and understood this document. The document should be retained for future reference.

Definition of symbols

Information that is particularly important is identified as follows:



DANGER!

This warning must be heeded! It warns of a hazardous situation that poses an immediate threat of serious injury and death and indicates preventive measures that can be taken.



WARNING!

This warning must be heeded! It warns of a hazardous situation that could lead to serious injury and death and indicates preventive measures that can be taken.



CAUTION!

This refers to a hazard that can lead to a less serious or minor injury plus material damage, and also provides information on preventive measures that can be taken.



NOTICE

This describes a situation in which the product or devices could be damaged and also provides information on preventive measures that can be taken. It also highlights areas within the text that are of particular importance.

**INFORMATION**

This gives advice on applications and provides information on special features.

Overview

The PSEN op2.1 L-Muting Set consists of

- ▶ 1 x PSEN op2.3 L-Reflex
- ▶ 1 x PSEN op2.4 L-Reflector
- ▶ 2 x PSEN op muting bracket kit

The PSEN op2.2 T-Muting Set consists of

- ▶ 2 x PSEN op2.3 L-Reflex
- ▶ 2 x PSEN op2.4 L-Reflector
- ▶ 2 x PSEN op muting bracket kit

The muting sets are suitable for expanding all safety light grids in the

- ▶ PSEN op4B/1 Series
- ▶ PSEN op2B/1 Series
- ▶ PSEN op4F-A Series
- ▶ PSEN op4H-A Series.

Use the PSEN op2.1 L-Muting Set

- ▶ To expand a linear model without integrated muting sensors into a linear module for muting in one direction or
- ▶ To expand a linear model for muting in one direction into a linear module for muting in two directions.

Use the PSEN op2.2 T-Muting Set

- ▶ To expand a linear model without integrated muting sensors into a linear module for muting in two directions.

Safety

Intended use

The muting set may only be used to expand a linear model without integrated muting sensors into a linear model for muting in one or two directions.

The PSEN op2.1 L-Muting Set may only be used in conjunction with the following light grids:

To expand into a linear model for muting in one direction

PSEN op4B/1 Series	PSEN op2B/1 Series	PSEN op4F-A Series	PSEN op4H-A Series
PSEN op4B-2-050/1	PSEN op2B-2-050/1	PSEN op4F-A-14-030/1	PSEN op4H-A-14-030/1
PSEN op4B-3-080/1	PSEN op2B-3-080/1	PSEN op4F-A-14-045/1	PSEN op4H-A-14-045/1
PSEN op4B-4-090/1	PSEN op2B-4-090/1	PSEN op4F-A-14-060/1	PSEN op4H-A-14-060/1
PSEN op4B-4-120/1	PSEN op2B-4-120/1	PSEN op4F-A-14-075/1	PSEN op4H-A-14-075/1
		PSEN op4F-A-14-090/1	PSEN op4H-A-14-090/1
		PSEN op4F-A-14-105/1	PSEN op4H-A-14-105/1
		PSEN op4F-A-14-120/1	PSEN op4H-A-14-120/1
		PSEN op4F-A-14-135/1	PSEN op4H-A-14-135/1
		PSEN op4F-A-14-150/1	PSEN op4H-A-14-150/1
		PSEN op4F-A-14-165/1	PSEN op4H-A-14-165/1
		PSEN op4F-A-14-180/1	PSEN op4H-A-14-180/1

To expand into a linear model for muting in two directions

PSEN op4B/1 Series
PSEN op4B-L-050/1
PSEN op4B-L-080/1

The PSEN op2.1 T-Muting Set may only be used in conjunction with the following light grids:

To expand into a linear model for muting in two directions

PSEN op4B/1 Series	PSEN op2B/1 Series	PSEN op4F-A Series	PSEN op4H-A Series
PSEN op4B-2-050/1	PSEN op2B-2-050/1	PSEN op4F-A-14-030/1	PSEN op4H-A-14-030/1
PSEN op4B-3-080/1	PSEN op2B-3-080/1	PSEN op4F-A-14-045/1	PSEN op4H-A-14-045/1
PSEN op4B-4-090/1	PSEN op2B-4-090/1	PSEN op4F-A-14-060/1	PSEN op4H-A-14-060/1
PSEN op4B-4-120/1	PSEN op2B-4-120/1	PSEN op4F-A-14-075/1	PSEN op4H-A-14-075/1
		PSEN op4F-A-14-090/1	PSEN op4H-A-14-090/1
		PSEN op4F-A-14-105/1	PSEN op4H-A-14-105/1
		PSEN op4F-A-14-120/1	PSEN op4H-A-14-120/1
		PSEN op4F-A-14-135/1	PSEN op4H-A-14-135/1
		PSEN op4F-A-14-150/1	PSEN op4H-A-14-150/1
		PSEN op4F-A-14-165/1	PSEN op4H-A-14-165/1
		PSEN op4F-A-14-180/1	PSEN op4H-A-14-180/1

The following is deemed improper use in particular:

- ▶ Any component, technical or electrical modification to the product
- ▶ Use of the product outside the areas described in this manual
- ▶ Use of the product outside the technical details (see chapter entitled "Technical Details").



NOTICE

EMC-compliant electrical installation

The product is designed for use in an industrial environment. The product may cause interference if installed in other environments. If installed in other environments, measures should be taken to comply with the applicable standards and directives for the respective installation site with regard to interference.

Safety regulations

Use of qualified personnel

The products may only be assembled, installed, programmed, commissioned, operated, maintained and decommissioned by competent persons.

A competent person is someone who, because of their training, experience and current professional activity, has the specialist knowledge required to test, assess and operate the work equipment, devices, systems, plant and machinery in accordance with the general standards and guidelines for safety technology.

It is the company's responsibility only to employ personnel who:

- ▶ Are familiar with the basic regulations concerning health and safety / accident prevention
- ▶ Have read and understood the information provided in this description under "Safety"
- ▶ And have a good knowledge of the generic and specialist standards applicable to the specific application.

Warranty and liability

All claims to warranty and liability will be rendered invalid if

- ▶ The product was used contrary to the purpose for which it is intended
- ▶ Damage can be attributed to not having followed the guidelines in the manual
- ▶ Operating personnel are not suitably qualified
- ▶ Any type of modification has been made (e.g. exchanging components on the PCB boards, soldering work etc.).

Disposal

- ▶ When decommissioning, please comply with local regulations regarding the disposal of electronic devices (e.g. Electrical and Electronic Equipment Act).

Installation and wiring

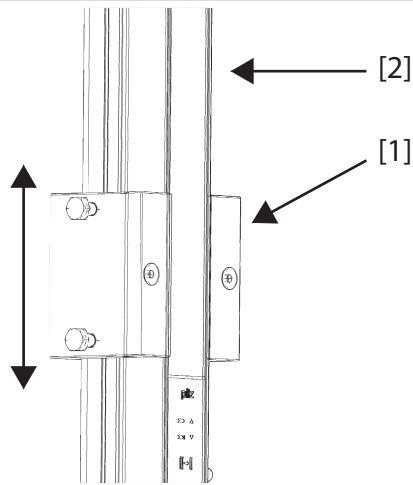
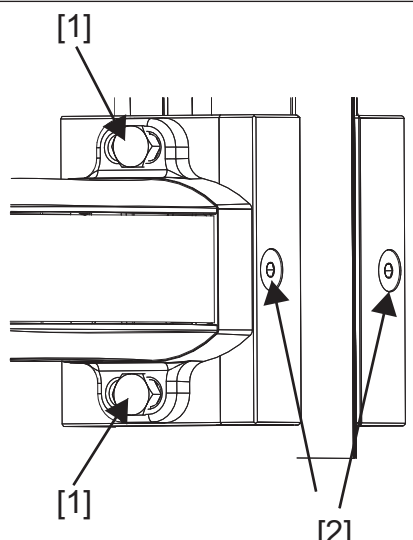
Installation

- ▶ Allocation of muting sensors to transmitter and receiver:
 - The passive muting sensor PSEN op Reflector must be installed on the transmitter Tx.
 - The active muting sensor PSEN op Reflex must be installed on the receiver Rx.

Requirement for installing the muting sensors on the safety light grid:

- ▶ The PSEN op muting bracket kit (Order no. 630 824) must be attached to both units of the safety light grid.
- ▶ The safety light grid must already be attached to the mounting surface.

Procedure

<p>Check the position of the mounting profile on the safety light grid and slide the mounting profile on both units of the safety light grid along to the correct position of the muting sensor. To do this, loosen the hexagonal screws. Then tighten up the hexagonal screws again.</p> <p>The mounting profiles should be at the same height.</p>	 <p>[1] Mounting profile for attaching the muting sensor [2] Safety light grid on mounting surface</p>
<p>Fix the muting sensor with the small plates to the mounting profile.</p>	 <p>[1] Hexagonal screws for attaching the mounting profile to the safety light grid [2] Allen screws for attaching the muting sensor to the mounting profile</p>

Wiring

Use one of the supplied connection cables to wire the muting sensors:

- ▶ PSEN op cable M12 4-p. 0.75m L-muting for L-muting
 - ▶ PSEN op cableset for T-muting
- ⇒ Wire the muting sensors as shown in the following diagrams.

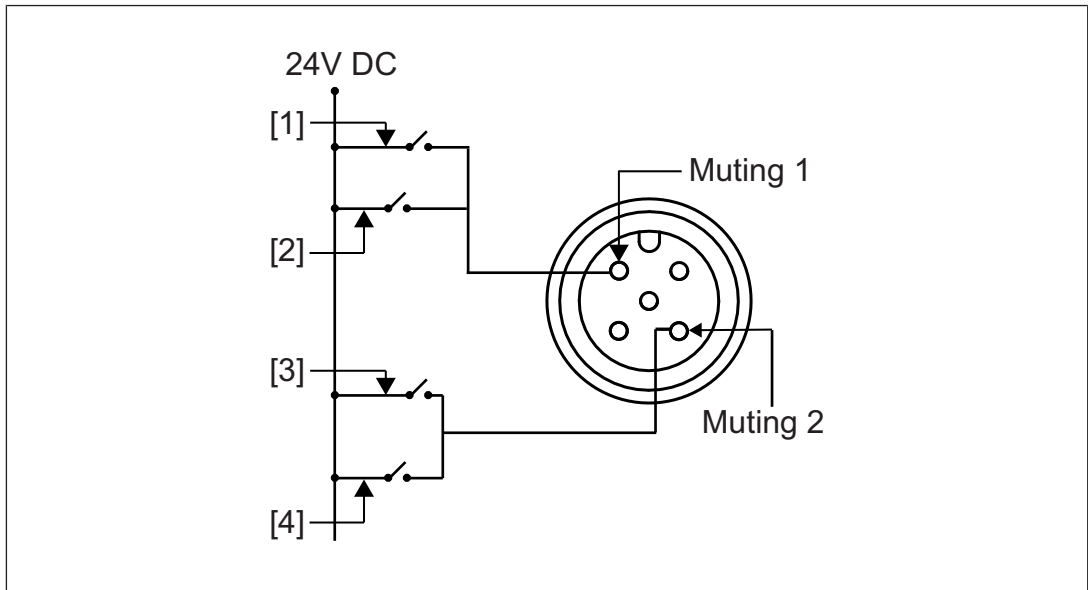


Fig.: Wiring of 4 muting sensors on the receiver's 5-pin connector

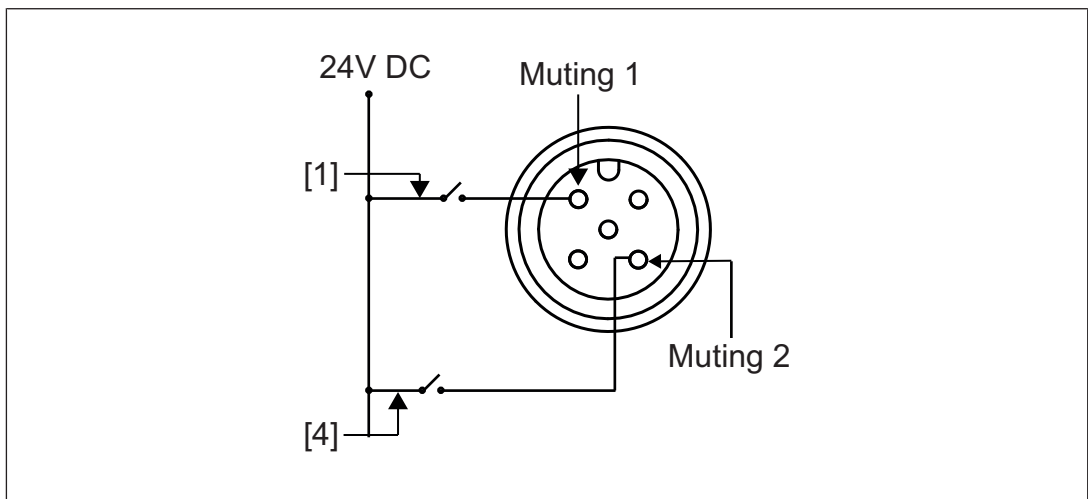


Fig.: Wiring of 2 muting sensors on the receiver's 5-pin connector

Legend

- [1] Wiring of muting sensor A1 on Pin 2 (Muting 1) of connector
- [2] Wiring of muting sensor A2 on Pin 2 (Muting 1) of connector
- [3] Wiring of muting sensor B1 on Pin 4 (Muting 2) of connector
- [4] Wiring of muting sensor B2 on Pin 4 (Muting 2) of connector

Earthing of muting sensors

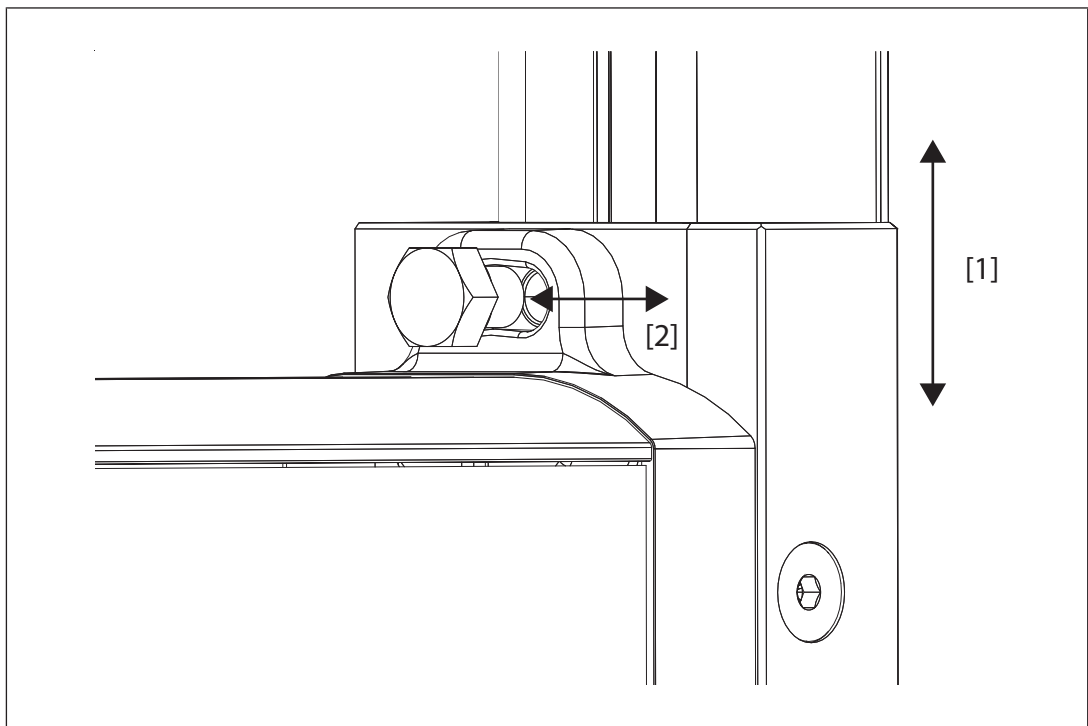
Attach the earth connection in the drill hole provided on the side of the muting sensors using the screw provided. The drill holes for the earthing screw are on the right and left side of the muting sensors, at the same height.

Identify the earthing contact using the adhesive label provided.

Commissioning

Orientation

1. Check that the safety light grid is aligned correctly and that the safety light grid is in normal operation. The green LED on the receiver, the yellow LED on the transmitter and both yellow LEDs on the receiver must be lit.
2. Make sure the DIP switches are set correctly for the choice of muting configuration.
 - If you are using the PSEN op2.1 L-Muting Set, set DIP switches 2 and 6 to OFF.
 - If you are using the PSEN op2.1 T-Muting Set, set DIP switches 2 and 6 to ON.
3. Use the LED to check the alignment of the muting sensors.
4. Modify the position of the muting sensors on the safety light grid until the red LEDs on the sensors go out (see diagram).
 - Vertical alignment of the muting sensors: Undo the hexagonal screws and move the mounting profile upwards.
 - Horizontal alignment of the muting sensors: Loosen the hexagonal screws and move the mounting profile within the slot hole for the hexagonal screws.



Legend:

[1]: Move the muting sensor upwards on the mounting profile for vertical alignment

[2]: Move the muting sensor within the slot hole for horizontal alignment

LED support during alignment

Display	LED	Meaning	
	[1] Normal operation indicator	Lights green	Transmitter and receiver are correctly aligned and the protected field is clear
	[2] High Align indicator	Lights yellow	Final upper transmitter lens is aligned with the receiver lens opposite
	[3] Safe condition indicator	Lights red	Transmitter and receiver are not correctly aligned or protected field is interrupted by an opaque object
	[4] Low Align indicator	Lights yellow	Final lower transmitter lens is aligned with the receiver lens opposite

LED indicators during alignment - Receiver

Prerequisites for muting

To use muting, the following requirements apply:

- ▶ the muting lamp must not be defective,
- ▶ the muting inputs must be wired correctly (see [Wiring \[9\]](#)),
- ▶ the safety light grid must be in normal operation.

If any of these requirements are not met, the safety light grid switches immediately to a safe condition when supply voltage is switched on.

Checking the safety light grid

Once the muting sensors have been installed and aligned, final inspections must be carried out before it can be put into service.

**INFORMATION**

This inspection may only be carried out by qualified personnel.

- ▶ Make sure that the safety light grid, including the muting sensors, are aligned and attached correctly. The red LED should not light up if gentle pressure is applied to the edges of the safety light grid.
- ▶ Make sure that the safety distance complies with the requirements stated in the operating manual of the relevant safety light grid.
- ▶ Make sure that the area between the safety light grid and the hazardous machine component cannot be accessed from any side.
- ▶ Make sure that the safety light grid cannot be impaired by external light sources.
- ▶ Make sure that, once switched on, the safety light grid switches to a safe condition if the protected field is accessed.

- ▶ Violate the protected field and check that
 - the OSSDs are switched off,
 - the red LED lights
 - the monitored machine is shut down.
- ▶ Check that the safety light grid's response time and the machine's stopping performance meet the specifications stated in the operating manual of the relevant safety light grid.
- ▶ Check that muting operates correctly. Access the protected field covered by the muting sensors.
 - The muting lamp on the safety light grid must light.
 - The red LEDs on the muting sensors must light.
 - The OSSDs must be switched off.
 - The monitored machine must be shut down.

Set muting timeout

Time monitoring for the muting function can be set to

- ▶ 10 minutes or
- ▶ to ∞

gestellt werden.

When the unit is delivered, this is already preset to 10 minutes.



CAUTION!

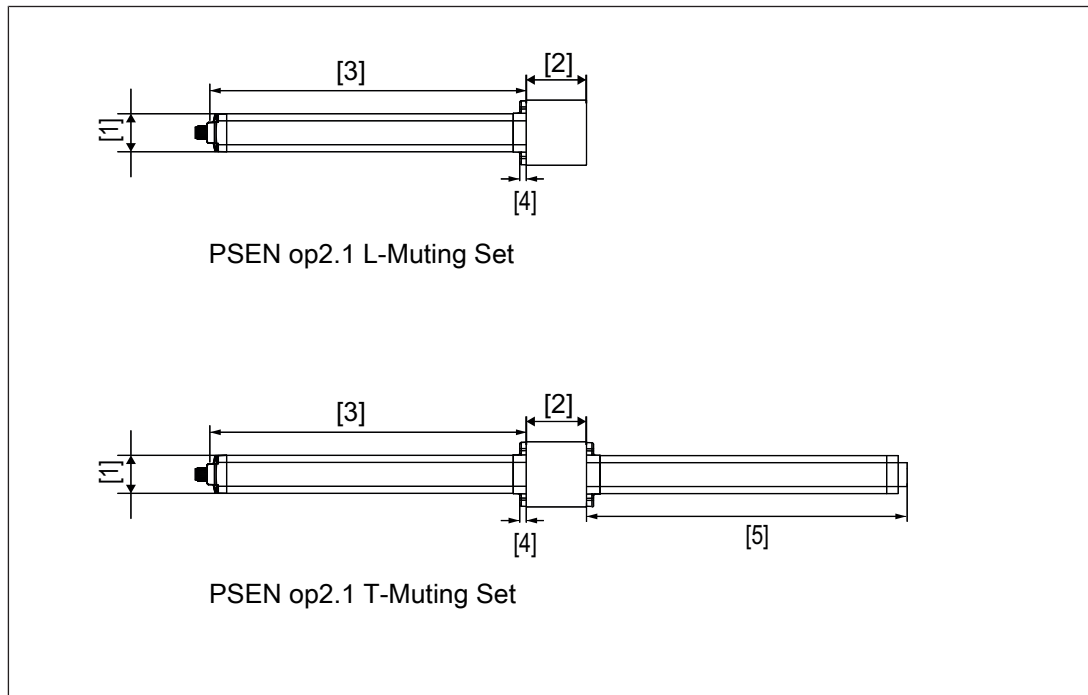
If time monitoring for the muting function is set to ∞ , the muting function is not cancelled until the muting sensors are no longer active. This setting does not comply with the specifications of EN ISO 61496-1.

Avoid a situation in which permanent muting (on account of simultaneous errors or constantly interrupted muting sensors) will not be detected.

Procedure for setting to ∞

Set DIP switches 1 and 5 to OFF.

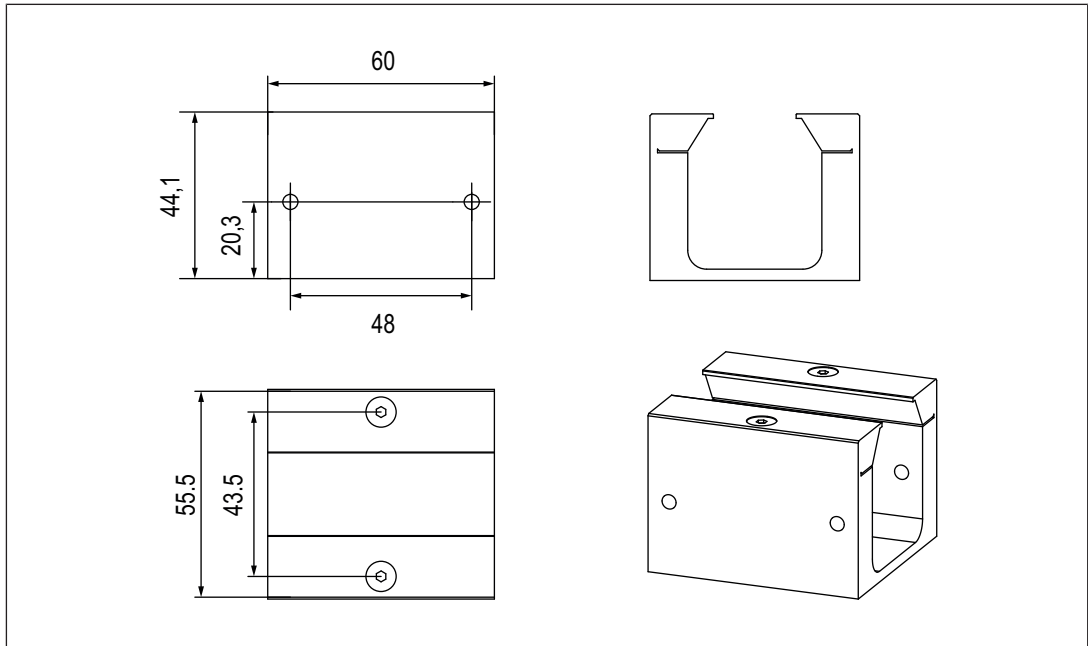
Dimensions in mm



Legend:

		in mm
[1]	Width of muting sensor	35
[2]	Width of PSEN op muting bracket kit	55.5
[3]	Length of active muting arm PSEN op2.3 L-Reflex	294
[4]	Width of the socket on the muting arms for attachment to the PSEN op muting bracket kit	6
[5]	Length of the passive muting arm PSEN op2.4 L-Reflector	294

Dimensions PSEN muting Bracket Kit



Technical details

PSEN op L-Muting Set and PSEN op T-Muting Set

General	630820	630821
Approvals	CE	CE
Sensor's mode of operation	optical	optical
Electrical data	630820	630821
Supply voltage		
Voltage	24,0 V	24,0 V
Kind	DC	DC
Voltage tolerance	-20 %/+20 %	-20 %/+20 %
Protection class	1	1
Optical data	630820	630821
Operating range	0,5 - 3,0 m	0,5 - 3,0 m
Used wavelength range	650 nm	650 nm
Environmental data	630820	630821
Ambient temperature		
Temperature range	-10 - 55 °C	-10 - 55 °C
Storage temperature		
Temperature range	-25 - 70 °C	-25 - 70 °C
Climatic suitability		
Humidity	95 % r. h. at 55 °C	95 % r. h. at 55 °C
Condensation during operation	Not permitted	Not permitted

Environmental data	630820	630821
Vibration		
In accordance with the standard	EN 60068-2-6	EN 60068-2-6
Frequency	10,0 - 55,0 Hz	10,0 - 55,0 Hz
Amplitude	0,35 mm	0,35 mm
Shock stress		
In accordance with the standard	EN 60068-2-29	EN 60068-2-29
Acceleration	10g	10g
Duration	16 ms	16 ms
Airgap creepage		
Pollution degree	2	2
Protection type		
In accordance with the standard	EN 60529	EN 60529
Housing	IP65	IP65
Mechanical data	630820	630821
Material		
Top	Aluminium	Aluminium
Dimensions		
Height	60,0 mm	60,0 mm
Width	355,3 mm	655,1 mm
Depth	40,0 mm	40,0 mm
Weight	1.100 g	1.800 g

PSEN op2.3 L-Reflex and PSEN op2.4 L-Reflector

General	630822	630823
Approvals	CE	CE
Sensor's mode of operation	optical	–
Electrical data	630822	630823
Supply voltage		
Voltage	24,0 V	24,0 V
Kind	DC	DC
Voltage tolerance	-20 %/+20 %	-20 %/+20 %
Protection class	1	1
Optical data	630822	630823
Operating range	0,5 - 3,0 m	–
Used wavelength range	650 nm	–
Environmental data	630822	630823
Ambient temperature		
Temperature range	-10 - 55 °C	-10 - 55 °C
Storage temperature		
Temperature range	-25 - 70 °C	-25 - 70 °C
Climatic suitability		
Humidity	95 % r. h. at 55 °C	95 % r. h. at 55 °C
Condensation during operation	Not permitted	Not permitted

Environmental data	630822	630823
Vibration		
In accordance with the standard	EN 60068-2-6	EN 60068-2-6
Frequency	10,0 - 55,0 Hz	10,0 - 55,0 Hz
Amplitude	0,35 mm	0,35 mm
Shock stress		
In accordance with the standard	EN 60068-2-29	EN 60068-2-29
Acceleration	10g	10g
Duration	16 ms	16 ms
Airgap creepage		
Pollution degree	2	2
Protection type		
In accordance with the standard	EN 60529	EN 60529
Housing	IP65	IP65
Mechanical data	630822	630823
Material		
Top	Aluminium	Aluminium
Dimensions		
Height	60,0 mm	60,0 mm
Width	299,8 mm	289,0 mm
Depth	40,0 mm	40,0 mm
Weight	480 g	350 g

PSEN op muting bracket kit

General	
Approvals	-
Mechanical data	
Material	Aluminium
Weight	170 g

Order reference

Product type	Features	Order no.
PSEN op2.1 L-Muting Set	L-muting sensors to retrofit	630 820
PSEN op2.2 T-Muting Set	T-muting sensors to retrofit	630 821
PSEN op2.3 L-Reflex	Single active muting sensor (without mounting bracket)	630 822
PSEN op2.4 L-Reflector	Single passive muting sensor (without mounting bracket)	630 823
PSEN op muting bracket kit	Mounting bracket for one muting sensor	630 824

► Support

Technical support is available from Pilz round the clock.

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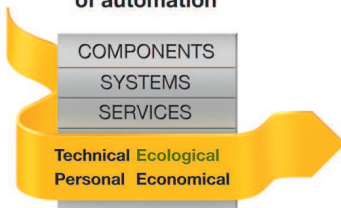
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Energy saving by Pilz



The 4-fold safety of automation



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