

Safety Switches with AS-Interface



EUCHNER

More than safety.

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More than safety.



Headquarters in Leinfelden-Echterdingen



Logistics center in Leinfelden-Echterdingen



Production location in Unterböhringen

Internationally successful – the EUCHNER company

EUCHNER GmbH + Co. KG is a world-leading company in the area of industrial safety technology. EUCHNER has been developing and producing high-quality switching systems for mechanical and systems engineering for more than 60 years.

The medium-sized family-operated company based in Leinfelden, Germany, employs around 700 people around the world.

16 subsidiaries and other sales partners in Germany and abroad work for our international success on the market.

Quality and innovation – the EUCHNER products

A look into the past shows EUCHNER to be a company with a great inventive spirit. We take the technological and ecological challenges of the future as an incentive for extraordinary product developments.

EUCHNER safety switches monitor safety doors on machines and installations, help to minimize dangers and risks and thereby reliably protect people and processes. Today, our products range from electromechanical and electronic components to intelligent integrated safety solutions. Safety for people, machines and products is one of our dominant themes.

We define future safety technology with the highest quality standards and reliable technology. Extraordinary solutions ensure the great satisfaction of our customers.

The product ranges are subdivided as follows:

- ▶ Transponder-coded Safety Switches
- ▶ Transponder-coded Safety Switches with guard locking
- ▶ Multifunctional Gate Box MGB
- ▶ Access management systems (Electronic-Key-System EKS)
- ▶ Electromechanical Safety Switches
- ▶ Magnetically coded Safety Switches
- ▶ Enabling Switches
- ▶ Safety Relays
- ▶ Emergency Stop Devices
- ▶ Hand-Held Pendant Stations and Handwheels
- ▶ Safety Switches with AS-Interface
- ▶ Joystick Switches
- ▶ Position Switches

 **made
in
Germany**

Safety Switches with AS-Interface

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Bus systems in safety engineering

Bus systems are also used for wiring safety products. The AS-Interface bus is recognized by accredited certification bodies. A consortium comprising various international companies was established to develop the safety-relevant part of the bus protocol.

With the AS-Interface Safety at Work, a monitor is employed as an additional bus subscriber to monitor the protocol. This protocol is embedded in the AS-Interface protocol, and its purpose is to guarantee safety on the bus. With Safety at Work, the monitor also assumes the link functions realized using safety relays and terminals when parallel wiring is used in the control cabinet. The monitor is thus ultimately a programmable small safety control system. The bus technology thus considerably reduces the amount of wiring, not only in the field, but especially in the control cabinet as well.

AS-Interface Safety at Work in safety engineering

AS-Interface is a low-level bus system that is used for the transfer of small data volumes. It is particularly suitable where digital signals are required in the field. However, analog signals can also be processed. Thanks to its simple structure, AS-Interface does not require any programming. For most bus subscribers, it is only necessary to set the address of the bus subscriber. No special knowledge of the bus is required.

Any safety component can be connected to the bus. The monitor is designed so that these components can be connected irrespective of their manufacturer. Device compatibility is guaranteed at all times. When connecting an AS-Interface Safety at Work device, it is important not only to ensure compatibility with the bus, but also to facilitate compliance with the Machinery Directive. AS-Interface certification ensures that the bus subscribers also comply with the standards that apply to the bus.

The ASiMon software is used to implement the links in the monitor. All settings for the safety components are thus made in the monitor. Setup diagnostics can be selected and the logical component links can be implemented. The monitor thus represents the core of the entire safety system. It replaces both the wiring and the safety relays.

The simple construction of a bus system practically eliminates the possibility of errors in the wiring. The bus and monitor diagnostic functions also facilitate rapid error detection. Consequently, setup can be performed directly after the planning phase and the preparation of the monitor configuration. The bus subscribers then simply have to be connected.

The extremely effective bus diagnostic function is also useful during operation. Should an error occur during operation, all states can be detected and displayed in the control system. Most EUCHNER safety switches have freely programmable LEDs that can be used for an effective diagnostic function. Any system standstills can thus be dealt with quickly.

Operation of AS-Interface Safety at Work

Replacing faulty components is very easy with AS-Interface Safety at Work. A bus subscriber that needs to be replaced only has to be substituted with a device with its address set to 0. The bus starts this device automatically when a button is pressed. This exchange thus progresses very rapidly and without the use of a programming device. It is even possible to replace the monitor with a new device without the use of a computer. Here too, a new device and the push of a button are all that is needed to get the system up and running again.

Because of the many advantages of AS-Interface Safety at Work and the large selection of different safety components, this system is also ideal as an autarchic safety system within an installation that uses a higher-level fieldbus. If the diagnostic function is required in this case, it can easily be incorporated in the higher-level bus by means of an integrated gateway.

EUCHNER safety switches maximize all of the features that the bus has to offer. Switches with guard locking do more than just signal the position of the movable safety guards to the control system. They also distinguish and signal the position of the guard locking compared with the position of the door. Complete visualization of the safety guard is thus possible.

With EUCHNER switches, the guard locking is controlled using the bus. Because of the separate supply cable for the auxiliary power, the guard locking can also be activated as a safe channel. Many switches have LEDs integrated on the front; these LEDs can be controlled using the bus. On-site diagnosis can therefore be performed with the control system without the need for additional wiring.

Minimization of the costs for hardware

Instead of a separate monitor, EUCHNER also offers devices on which the monitor is directly integrated in the gateway. As a result the costs for hardware are reduced and the functionality increased at the same time. On the integrated gateway with monitor GMOx two complete AS-i buses can be connected; in the application these buses act like a single larger AS-i bus.

In addition, the number of safe outputs increases to up to 16 per device used. On the GMOx devices, safe distributed outputs SOM can be used on the AS-i bus. These outputs have relay contacts for shutdown, but can also read inputs at the same time. Control and also diagnostics in this case are via the GMOx. In addition the output SOM can be controlled by the machine control system during operation. This feature of course only works if the GMOx also provides an enable.

Safety switch NZ.VZ



- ▶ Housing according to EN 50041



Approach direction

- ▶ Horizontal
- ▶ Adjustable in 90° steps.

AS-Interface inputs

- ▶ **D0, D1** Positively driven contact 1
 - ▶ **D2, D3** Positively driven contact 2
- Evaluation is performed via a safety monitor.

AS-Interface outputs

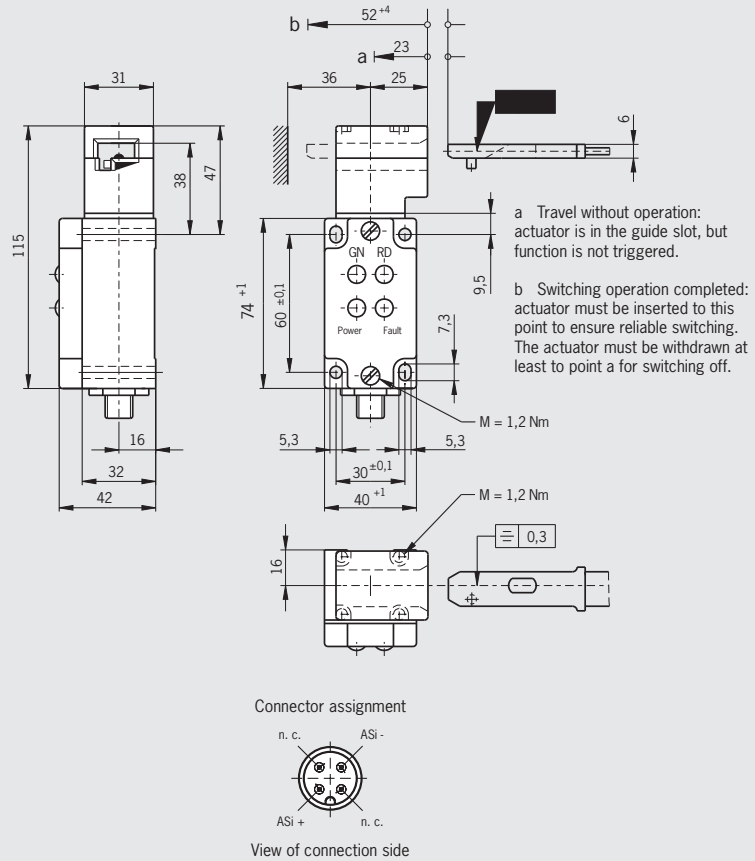
- ▶ **D1** Red LED
- ▶ **D2** Green LED

LED function display

- ▶ The *Power* LED indicates the operating voltage on the bus.
- ▶ The *Fault* LED indicates if a fault has been detected on the AS-Interface bus.
- ▶ The green and the red LEDs can be controlled as required by the control system via the bus using bits D1 and D2.

Plug connector M12 4-pin

Dimension drawing



Please order actuator and connection material separately.
For detailed information and suitable accessories, enter the order number for the product in the search box at www.euchner.com.

Ordering table

Series	Connection	Actuator	Switching element	Order no./ item
NZ	SEM 4 Plug connector M12	VZ Separate actuator	2 NC ⇄	090742 NZ2VZ-538ESEM4-AS1

Safety switch TZ with guard locking and guard lock monitoring



- ▶ Auxiliary release on the front
- ▶ Actuating head fitted left or right



Auxiliary release

Is used for releasing the guard locking with the aid of a tool. A seal and auxiliary tool are fitted to protect against tampering.

Guard locking types

TZ1 Closed-circuit current principle, guard locking by spring force. Release by control of AS-i output O.

TZ2 Open-circuit current principle, guard locking by control of AS-i output O. Release by spring force.

Control of the guard locking solenoid

The guard locking solenoid is controlled by the control system via AS-Interface system via AS-Interface bus bit D0. In addition the 24V connection can be switched safely.

AS-Interface inputs

- ▶ **D0, D1** Door monitoring contact SK
 - ▶ **D2, D3** Solenoid monitoring contact ÜK
- Evaluation is performed via a safety monitor.

AS-Interface outputs

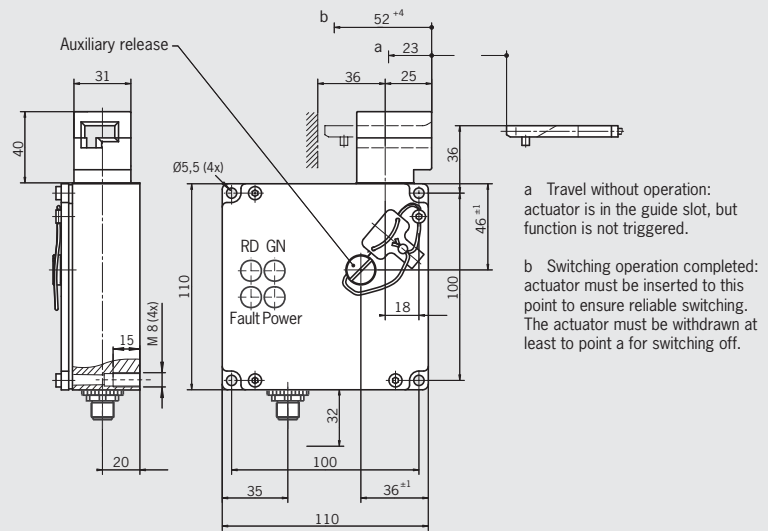
- ▶ **D0** Guard locking solenoid
- ▶ **D1** Red LED
- ▶ **D2** Green LED

LED function display

- ▶ The *Power* LED indicates the operating voltage on the bus.
- ▶ The *Fault* LED indicates if a fault has been detected on the AS-Interface bus.
- ▶ The green and the red LEDs can be controlled as required by the control system via the bus using bits D1 and D2.

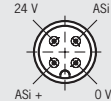
Plug connector M12
4-pin

Dimension drawings (actuating head on the left is a mirror image)



- a Travel without operation: actuator is in the guide slot, but function is not triggered.
- b Switching operation completed: actuator must be inserted to this point to ensure reliable switching. The actuator must be withdrawn at least to point a for switching off.

Connector assignment



View of connection side

Please order actuator and connection material separately.
For detailed information and suitable accessories, enter the order number for the product in the search box at www.euchner.com.

Ordering table

Series	Connection	Guard locking	Switch head	Switching element	Order no./ item
TZ	SEM 4 Plug connector M12	1 Mechanical	LE Left	SK: 1 NC ⇌ ÜK: 1 NC ⇌	086140 TZ1LE024SEM4AS1
			RE Right	SK: 1 NC ⇌ ÜK: 1 NC ⇌	086141 TZ1RE024SEM4AS1
		2 Electrical	LE Left	SK: 1 NC ⇌ ÜK: 1 NC ⇌	086990 TZ2LE024SEM4AS1
			RE Right	SK: 1 NC ⇌ ÜK: 1 NC ⇌	086991 TZ2RE024SEM4AS1

Safety switch TZ with guard locking and guard lock monitoring



- ▶ Auxiliary release on the front
- ▶ Escape release on the rear with key button
- ▶ Actuating head fitted left or right



Auxiliary release

Is used for releasing the guard locking with the aid of a tool. A seal and auxiliary tool are fitted to protect against tampering.

Escape release

This is used for manual release of guard locking from within the danger area without tools. The disable can only be removed and the switch returned to its operating state using a key included.

Guard locking type

TZ1 Closed-circuit current principle, guard locking by spring force. Release by control of AS-i output 0.

Control of the guard locking solenoid

The guard locking solenoid is controlled by the control system via AS-Interface bus bit D0. In addition the 24V connection can be switched safely.

AS-Interface inputs

- ▶ **D0, D1** Door monitoring contact SK
 - ▶ **D2, D3** Solenoid monitoring contact ÜK
- Evaluation is performed via a safety monitor.

AS-Interface outputs

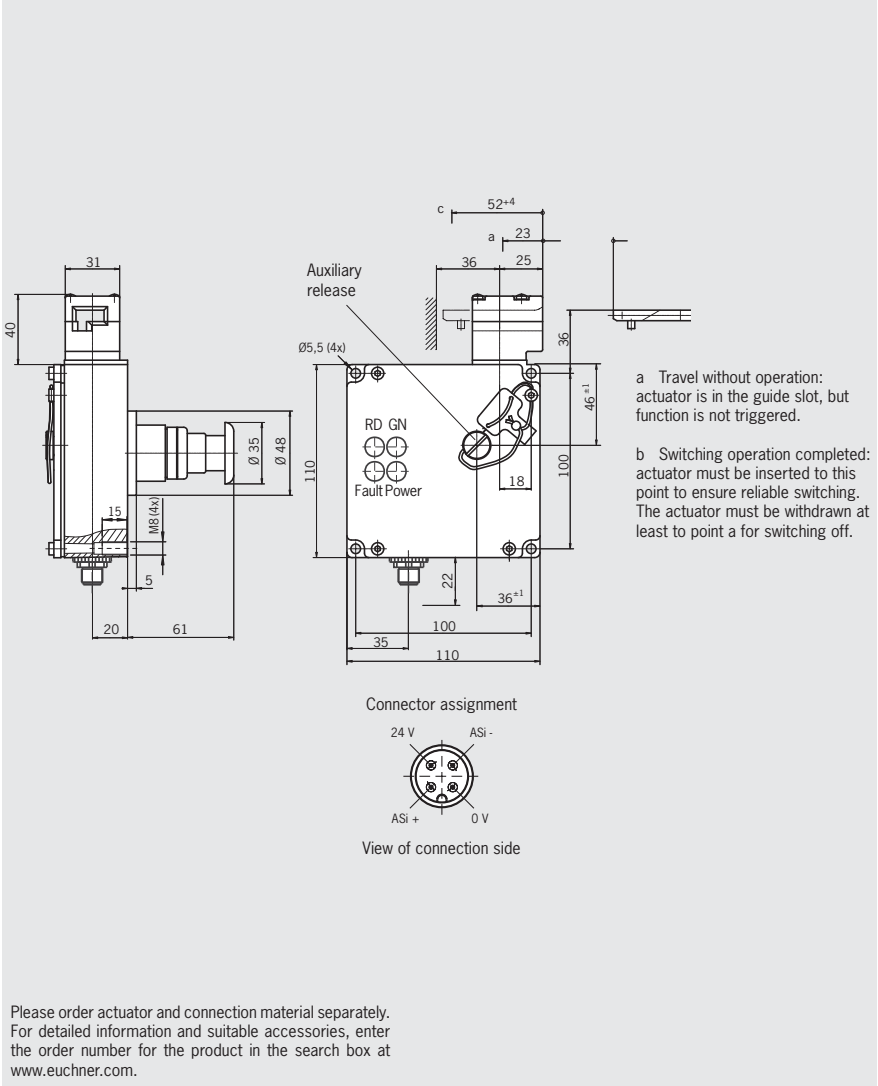
- ▶ **D0** Guard locking solenoid
- ▶ **D1** Red LED
- ▶ **D2** Green LED

LED function display

- ▶ The Power LED indicates the operating voltage on the bus.
- ▶ The Fault LED indicates if a fault has been detected on the AS-Interface bus.
- ▶ The green and the red LEDs can be controlled as required by the control system via the bus using bits D1 and D2.

Plug connector M12
4-pin

Dimension drawings (actuating head on the left is a mirror image)



- a Travel without operation: actuator is in the guide slot, but function is not triggered.
- b Switching operation completed: actuator must be inserted to this point to ensure reliable switching. The actuator must be withdrawn at least to point a for switching off.

Ordering table

Series	Connection	Guard locking	Switch head	Switching element	Version	Order no./ item
TZ	SEM 4 Plug connector M12	1 Mechanical	LE Left	SK: 1 NC ⊕ UK: 1 NC ⊕	C1815 Escape release (red key button)	094422 TZ1LE024SEM4ASI-C1815
			RE Right	SK: 1 NC ⊕ UK: 1 NC ⊕	C1815 Escape release (red key button)	094423 TZ1RE024SEM4ASI-C1815

Safety switch TZ with guard locking and guard lock monitoring



- ▶ Emergency unlocking on the front with rotary knob
- ▶ Actuating head fitted left or right



Emergency unlocking

Is used for the manual release of the guard locking without tools. The emergency unlocking mechanism must be returned to the locked state manually. A sealing wire is fitted to protect against tampering.

Guard locking type

TZ1 Closed-circuit current principle, guard locking by spring force. Release by control of AS-i output O.

Control of the guard locking solenoid

The guard locking solenoid is controlled by the control system via AS-Interface bus bit D0. In addition the 24V connection can be switched safely.

AS-Interface inputs

- ▶ **D0, D1** Door monitoring contact SK
 - ▶ **D2, D3** Solenoid monitoring contact ÜK
- Evaluation is performed via a safety monitor.

AS-Interface outputs

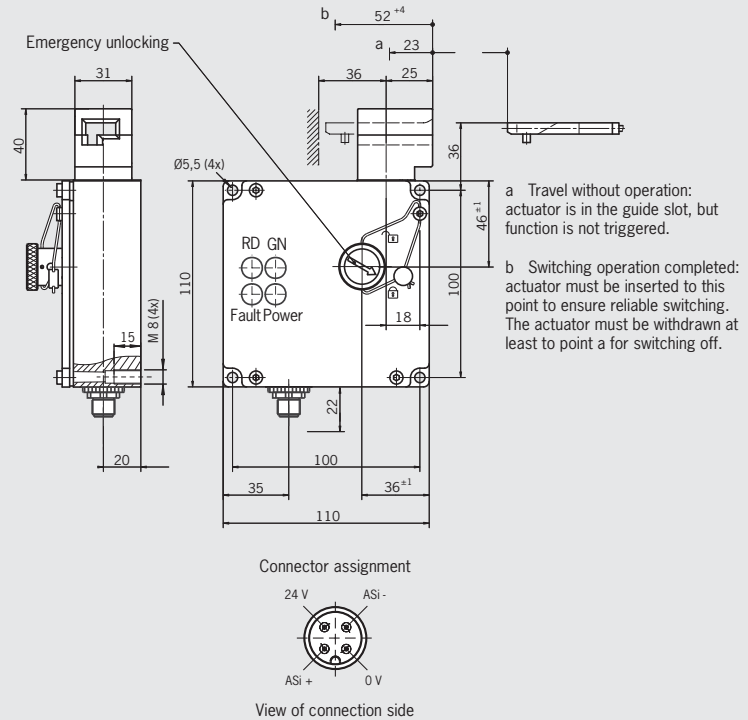
- ▶ **D0** Guard locking solenoid
- ▶ **D1** Red LED
- ▶ **D2** Green LED

LED function display

- ▶ The *Power* LED indicates the operating voltage on the bus.
- ▶ The *Fault* LED indicates if a fault has been detected on the AS-Interface bus.
- ▶ The green and the red LEDs can be controlled as required by the control system via the bus using bits D1 and D2.

Plug connector M12
4-pin

Dimension drawings (actuating head on the left is a mirror image)



Please order actuator and connection material separately. For detailed information and suitable accessories, enter the order number for the product in the search box at www.euchner.com.

Ordering table

Series	Connection	Guard locking	Switch head	Switching element	Version	Order no./ item
TZ	SEM 4 Plug connector M12	1 Mechanical	LE Left	SK: 1 NC ⊕ UK: 1 NC ⊕	C1937 Emergency unlocking	090278 TZ1LE024SEM4AS1-C1937
			RE Right	SK: 1 NC ⊕ UK: 1 NC ⊕	C1937 Emergency unlocking	090279 TZ1RE024SEM4AS1-C1937

Safety switch NX

- ▶ LED function display



Approach direction



Horizontal and vertical
Adjustable in 90° steps.

AS-Interface inputs

- ▶ **D0, D1** Positively driven contact 1
 - ▶ **D2, D3** Positively driven contact 2
- Evaluation is performed via a safety monitor.

AS-Interface outputs

- ▶ **D1** Red LED
- ▶ **D2** Green LED

Internal LED function display

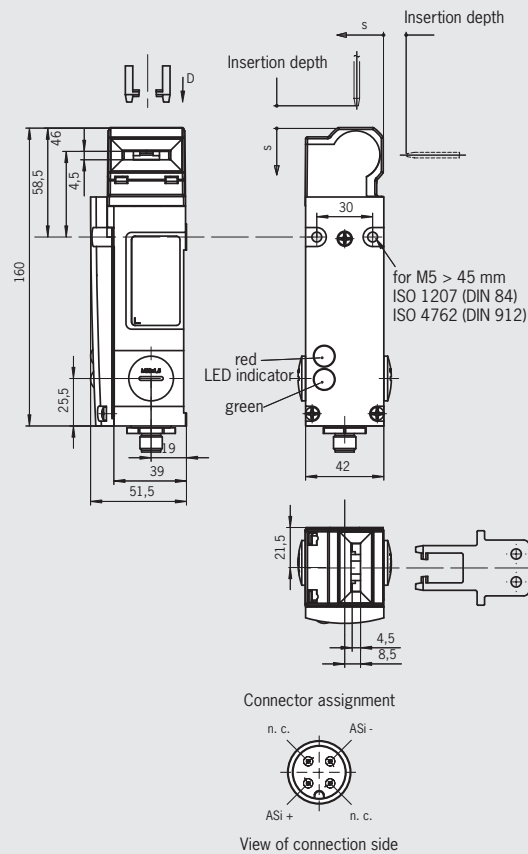
- ▶ The *Power* LED indicates the operating voltage on the bus.
- ▶ The *Fault* LED indicates if a fault has been detected on the AS-Interface bus.

External LED function display

- ▶ The green and the red LEDs can be controlled as required by the control system via the bus using bits D1 and D2.

Plug connector M12 4-pin

Dimension drawing



Please order actuator and connection material separately.
For detailed information and suitable accessories, enter the order number for the product in the search box at www.euchner.com.

Ordering table

Series	Connection	Switching element	Order no./ item
NX	SEM 4 Plug connector M12	2 NC ⊖	094362 NX1-2131ASEM4-AS1

Safety switch TX with guard locking and guard lock monitoring



- ▶ Auxiliary release on the front
- ▶ Escape release on the rear optional



Approach direction



Horizontal
Adjustable in 90° steps.

Auxiliary release

Is used for releasing the guard locking with the aid of a tool. To protect against tampering, the auxiliary release is sealed with sealing lacquer.

Escape release

This is used for manual release of guard locking from within the danger area without tools. With identification of On/Off position.

Guard locking type

TX1 Closed-circuit current principle, guard locking by spring force. Release by control of AS-i output 0.

Control of the guard locking solenoid

The guard locking solenoid is controlled by the control system via AS-Interface bus bit D0. In addition the 24V connection can be switched safely.

AS-Interface inputs

- ▶ **D0, D1** Positively driven contact 1 (safety door monitoring)
- ▶ **D2, D3** Positively driven contact 2 (guard lock monitoring)

Evaluation is performed via a safety monitor.

AS-Interface outputs

- ▶ **D1** Red LED
- ▶ **D2** Green LED

Internal LED function display

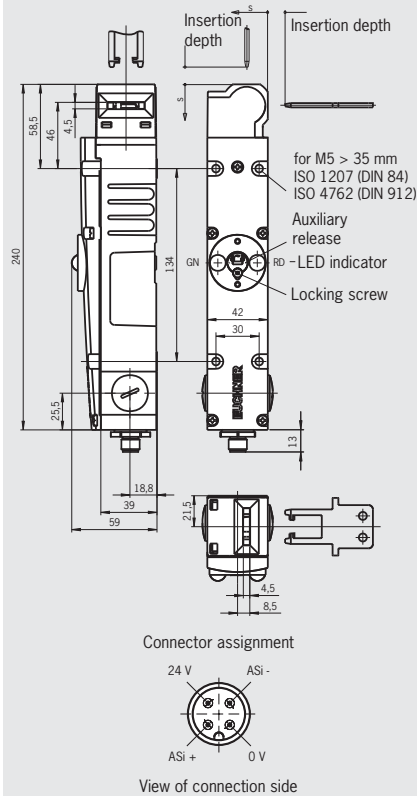
- ▶ The *Power* LED indicates the operating voltage on the bus.
- ▶ The *Fault* LED indicates if a fault has been detected on the AS-Interface bus.

External LED function display

- ▶ The green and the red LEDs can be controlled as required by the control system via the bus using bits D1 and D2.

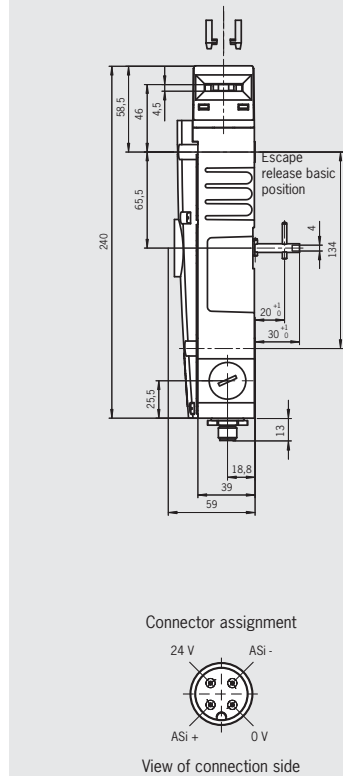
Without escape release Plug connector M12, 4-pin

Dimension drawing



Please order actuator and connection material separately. For detailed information and suitable accessories, enter the order number for the product in the search box at www.euchner.com.

With escape release Plug connector M12, 4-pin



Please order actuator and connection material separately. For detailed information and suitable accessories, enter the order number for the product in the search box at www.euchner.com.

Ordering table

Series	Connection	Guard locking	Switching element	Version	Order no./ item
TX	SEM 4 Plug connector M12	1 Mechanical	SK: 1 NC ⊖ UK: 1 NC ⊖		094403 TX1B-A024SEM4AS1
				C1991 with escape release	095914 TX1B-A024SEM4AS1C1991

Safety switch STA with guard locking and guard lock monitoring



- ▶ Auxiliary release on the front



Auxiliary release

Is used for releasing the guard locking with the aid of a tool. To protect against tampering, the auxiliary release is sealed with sealing lacquer.

Guard locking type

STA3 Closed-circuit current principle, guard locking by spring force. Release by control of AS-i output 0.

STA4 Open-circuit current principle, guard locking by control of AS-i output 0. Release by spring force.

Control of the guard locking solenoid

The guard locking solenoid is controlled by the control system via AS-Interface bus bit D0. In addition the 24V connection can be switched safely.

AS-Interface inputs

- ▶ **D0, D1** Door monitoring contact SK
 - ▶ **D2, D3** Solenoid monitoring contact ÜK
- Evaluation is performed via a safety monitor.

AS-Interface outputs

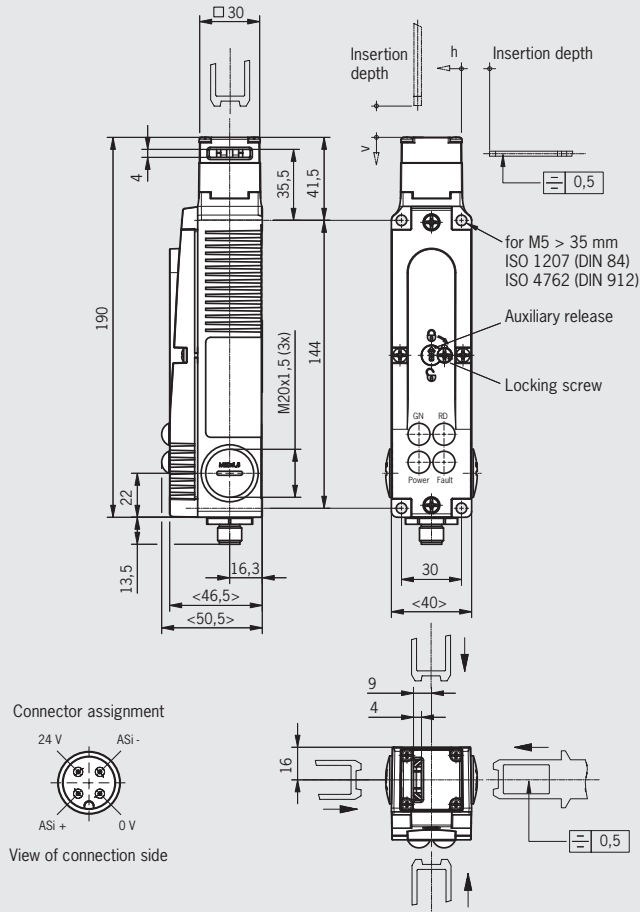
- ▶ **D0** Guard locking solenoid
- ▶ **D1** Red LED
- ▶ **D2** Green LED

LED function display

- ▶ The *Power* LED indicates the operating voltage on the bus.
- ▶ The *Fault* LED indicates if a fault has been detected on the AS-Interface bus.
- ▶ The green and the red LEDs can be controlled as required by the control system via the bus using bits D1 and D2.

Plug connector M12
4-pin

Dimension drawing



Ordering table

Series	Connection	Guard locking	Switching element	Order no./ item
STA	SEM 4 Plug connector M12	3 Mechanical	SK: 1 NC ⊕ ÜK: 1 NC ⊕	098993 STA3A-4141A024SEM4AS1
		4 Electrical	SK: 1 NC ⊕ ÜK: 1 NC ⊕	105305 STA4A-4141A024SEM4AS1

Safety switch STA with guard locking and guard lock monitoring



- ▶ Escape release on the rear
- ▶ Auxiliary release on the front



Auxiliary release

Is used for releasing the guard locking with the aid of a tool. To protect against tampering, the auxiliary release is sealed with sealing lacquer.

Escape release (C1993, long actuator shaft)

This is used for manual release of guard locking from within the danger area without tools. With identification of On/Off position.

Guard locking type

STA3 Closed-circuit current principle, guard locking by spring force. Release by control of AS-i output 0.

Control of the guard locking solenoid

The guard locking solenoid is controlled by the control system via AS-Interface bus bit D0. In addition the 24V connection can be switched safely.

AS-Interface inputs

- ▶ **D0, D1** Door monitoring contact SK
- ▶ **D2, D3** Solenoid monitoring contact ÜK

Evaluation is performed via a safety monitor.

AS-Interface outputs

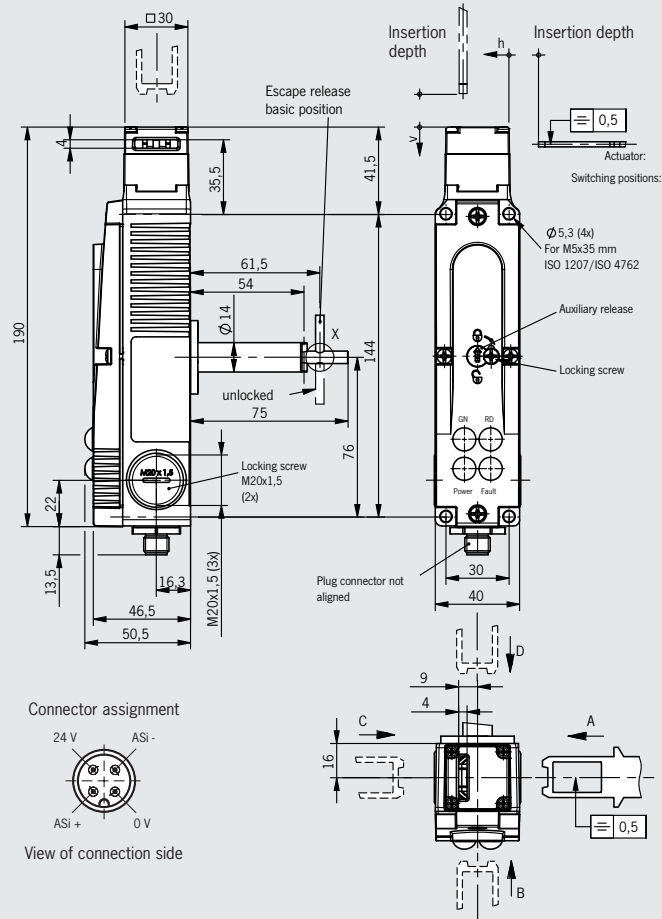
- ▶ **D0** Guard locking solenoid
- ▶ **D1** Red LED
- ▶ **D2** Green LED

LED function display

- ▶ The *Power* LED indicates the operating voltage on the bus.
- ▶ The *Fault* LED indicates if a fault has been detected on the AS-Interface bus.
- ▶ The green and the red LEDs can be controlled as required by the control system via the bus using bits D1 and D2.

Plug connector M12 4-pin

Dimension drawing



Please order actuator and connection material separately. For detailed information and suitable accessories, enter the order number for the product in the search box at www.euchner.com.

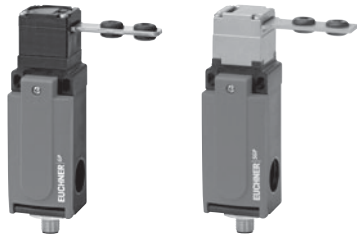
Ordering table

Series	Connection	Guard locking	Switching element	Order no./ item
STA	SEM 4 Plug connector M12	3 Mechanical	SK: 1 NC ⊖ ÜK: 1 NC ⊖	119732 STA3A-4141A024SEM4AS1C1993

Safety Switches with Separate Actuator, Plastic Housing **EUCHNER**

Safety switches GP and SGP

- ▶ For metal SGP actuating head
- ▶ External LED function display optional



Approach direction



Can be adjusted horizontally and vertically in 90° steps.

AS-Interface inputs

- ▶ **D0, D1** Positively driven contact 1
 - ▶ **D2, D3** Positively driven contact 2
- Evaluation is performed via a safety monitor.

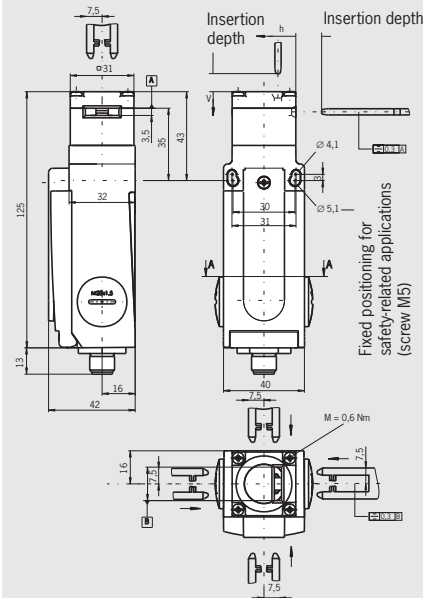
LED function display

internal with open cover

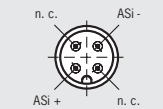
- ▶ The *Power* LED indicates the operating voltage on the bus.
- ▶ The *Fault* LED indicates if a fault has been detected on the AS-Interface bus.

GP, plug connector M12 4-pin

Dimension drawing



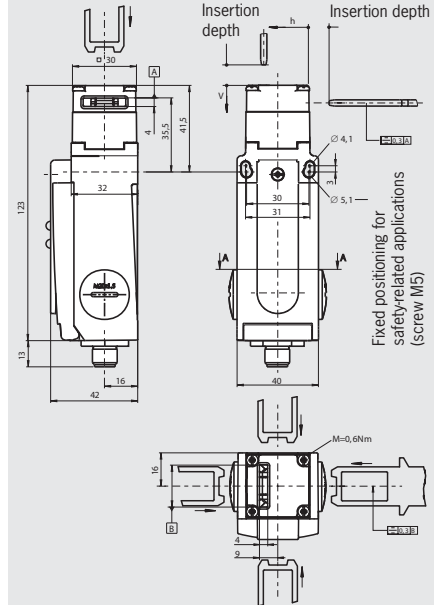
Connector assignment



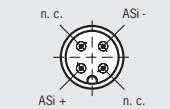
View of connection side

Please order actuator and connection material separately. For detailed information and suitable accessories, enter the order number for the product in the search box at www.euchner.com.

SGP, plug connector M12 4-pin



Connector assignment



View of connection side

Please order actuator and connection material separately. For detailed information and suitable accessories, enter the order number for the product in the search box at www.euchner.com.

Ordering table

Series	Connection	Switching element	LED function display	Order no./ item
GP	SEM 4 Plug connector M12	2 NC ⊖	internal	091193 GP3-538ASEM4AS1
SGP	SEM 4 Plug connector M12	2 NC ⊖	internal	099126 SGP3E-538ASEM4AS1



Safety switch TP with guard locking

- ▶ Auxiliary release on the front
- ▶ Increased horizontal overtravel
- ▶ Optional without guard lock monitoring



Auxiliary release

Is used for releasing the guard locking with the aid of a tool. To protect against tampering, the auxiliary release is sealed with sealing lacquer.

Guard locking types

TP3 Closed-circuit current principle, guard locking by spring force. Release by control of AS-i output O.

TP4 Open-circuit current principle, guard locking by control of AS-i output O. Release by spring force.

Control of the guard locking solenoid

The guard locking solenoid is controlled by the control system via AS-Interface bus bit D0. In addition the 24V connection can be switched safely.

AS-Interface inputs, version AS1

- ▶ **D0, D1** Door monitoring contact SK
- ▶ **D2, D3** Solenoid monitoring contact ÜK

AS-Interface inputs, version AS2

- ▶ **D0, D1** Door monitoring contact SK 1
- ▶ **D2, D3** Door monitoring contact SK 2

Evaluation is performed via a safety monitor.

AS-Interface outputs

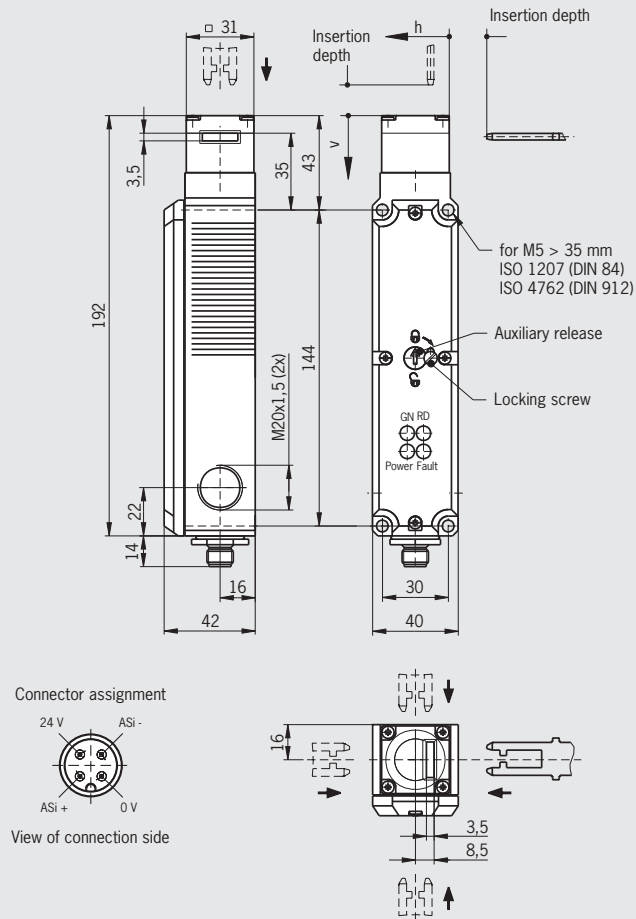
- ▶ **D0** Guard locking solenoid
- ▶ **D1** Red LED
- ▶ **D2** Green LED

LED function display

- ▶ The *Power* LED indicates the operating voltage on the bus.
- ▶ The *Fault* LED indicates if a fault has been detected on the AS-Interface bus.
- ▶ The green and the red LEDs can be controlled as required by the control system via the bus using bits D1 and D2.

Plug connector M12
4-pin

Dimension drawing



Please order actuator and connection material separately.
For detailed information and suitable accessories, enter the order number for the product in the search box at www.euchner.com.

Ordering table

Series	Connection	Guard locking	Switching element	Version	Order no./ item
TP	SEM 4 Plug connector M12	3 Mechanical	SK: 1 NC ⊕ ÜK: 1 NC ⊕	AS1 With guard lock monitoring	088256 TP3-4141A024SEM4AS1
		4 Electrical	SK: 1 NC ⊕ ÜK: 1 NC ⊕	AS1 With guard lock monitoring	088257 TP4-4141A024SEM4AS1
			SK: 2 NC ⊕	AS2 Without guard lock monitoring	091676 TP4-4141A024SEM4AS2

Safety switch STP with guard locking and guard lock monitoring



- ▶ Actuating head made of metal
- ▶ Auxiliary release on the front



Auxiliary release

Is used for releasing the guard locking with the aid of a tool. To protect against tampering, the auxiliary release is sealed with sealing lacquer.

Guard locking types

STP3 Closed-circuit current principle, guard locking by spring force. Release by control of AS-i output 0.

STP4 Open-circuit current principle, guard locking by control of AS-i output 0. Release by spring force.

Control of the guard locking solenoid

The guard locking solenoid is controlled by the control system via AS-Interface bus bit D0. In addition the 24V connection can be switched safely.

AS-Interface inputs

- ▶ **D0, D1** Door monitoring contact SK
 - ▶ **D2, D3** Solenoid monitoring contact ÜK
- Evaluation is performed via a safety monitor.

AS-Interface outputs

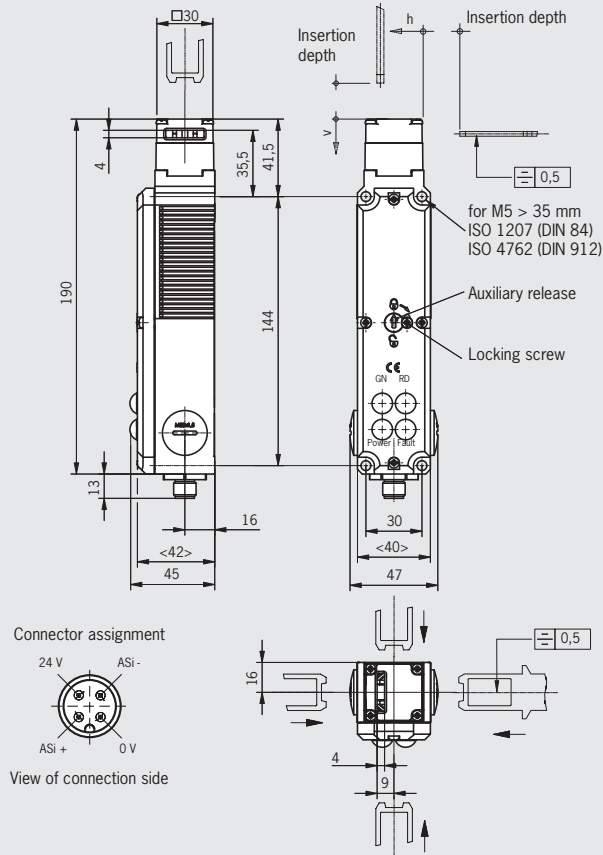
- ▶ **D0** Guard locking solenoid
- ▶ **D1** Red LED
- ▶ **D2** Green LED

LED function display

- ▶ The *Power* LED indicates the operating voltage on the bus.
- ▶ The *Fault* LED indicates if a fault has been detected on the AS-Interface bus.
- ▶ The green and the red LEDs can be controlled as required by the control system via the bus using bits D1 and D2.

Plug connector M12
4-pin

Dimension drawing



Ordering table

Series	Connection	Guard locking	Switching element	Order no./ item
STP	SEM 4 Plug connector M12	3 Mechanical	SK: 1 NC ⊕ ÜK: 1 NC ⊕	097790 STP3A-4141A024SEM4AS1
		4 Electrical	SK: 1 NC ⊕ ÜK: 1 NC ⊕	097789 STP4A-4141A024SEM4AS1

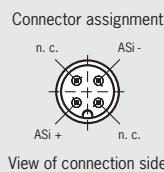
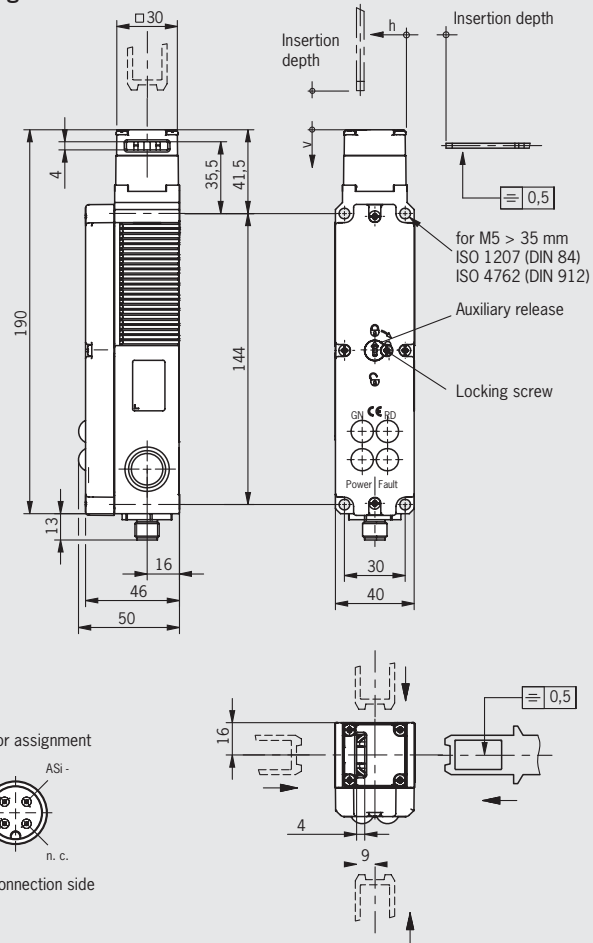
Safety switch STP with guard locking and guard lock monitoring



- ▶ Power supply for the guard locking solenoid from AS-i bus
- ▶ Actuating head made of metal
- ▶ Auxiliary release on the front
- ▶ According to AS-Interface specification 3.1

Plug connector M12
4-pin

Dimension drawing



Please order actuator and connection material separately. For detailed information and suitable accessories, enter the order number for the product in the search box at www.euchner.com.

Auxiliary release

Is used for releasing the guard locking with the aid of a tool. To protect against tampering, the auxiliary release is sealed with sealing lacquer.

Guard locking types

STP3 Closed-circuit current principle, guard locking by spring force. Release by control of AS-i output 0.

STP4 Open-circuit current principle, guard locking by control of AS-i output 0. Release by spring force.

Control of the guard locking solenoid

The guard locking solenoid is controlled by the control system via AS-Interface bus bit D0. It is only supplied from the AS-i bus; an additional supply of auxiliary power is not necessary. The current consumption with solenoid switched on is 400 mA.

AS-Interface inputs

- ▶ **D0, D1** Door monitoring contact SK
 - ▶ **D2, D3** Solenoid monitoring contact ÜK
- Evaluation is performed via a safety monitor.

AS-Interface outputs

- ▶ **D0** Guard locking solenoid
- ▶ **D1** Red LED
- ▶ **D2** Green LED

LED function display

- ▶ The *Power* LED indicates the operating voltage on the bus.
- ▶ The *Fault* LED indicates if a fault has been detected on the AS-Interface bus.
- ▶ The green and the red LEDs can be controlled as required by the control system via the bus using bits D1 and D2.

Ordering table

Series	Connection	Guard locking	Switching element	Order no./ item
STP	SEM 4 Plug connector M12	3 Mechanical	SK: 1 NC ⊕ ÜK: 1 NC ⊕	106648 STP3A-4141A024SEM4AS3
		4 Electrical	SK: 1 NC ⊕ ÜK: 1 NC ⊕	106649 STP4A-4141A024SEM4AS3

Safety Switches with Separate Actuator, Plastic Housing **EUCHNER**

Safety switch STP-TW with guard locking and guard lock monitoring



- ▶ Actuating heads made of metal
- ▶ Auxiliary release on the front
- ▶ Mechanical key release optional



Function

In the safe state, both actuators must be inserted into the switch head.

Auxiliary release

Is used for releasing the guard locking with the aid of a tool. To protect against tampering, the auxiliary release is sealed with sealing lacquer.

Guard locking types

STP-TW3 Closed-circuit current principle, guard locking by spring force. Release by control of AS-i output 0.

Control of the guard locking solenoid

The guard locking solenoid is controlled by the control system via AS-Interface bus bit D0. In addition the 24V connection can be switched safely.

AS-Interface inputs

- ▶ **D0, D1** Door monitoring contact SK
 - ▶ **D2, D3** Solenoid monitoring contact ÜK
- Evaluation is performed via a safety monitor.

AS-Interface outputs

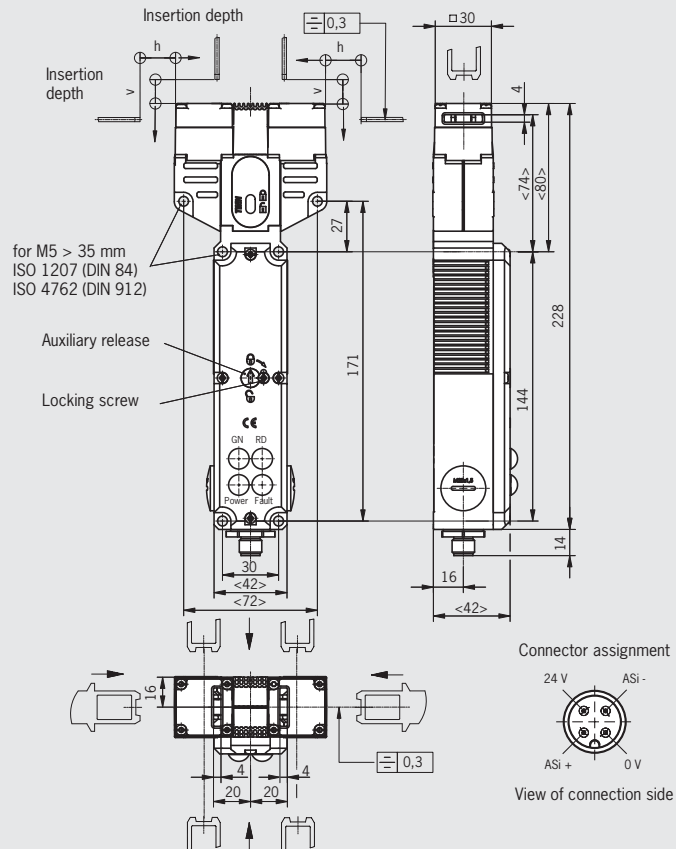
- ▶ **D0** Guard locking solenoid
- ▶ **D1** Red LED
- ▶ **D2** Green LED

LED function display

- ▶ The **Power LED** indicates the operating voltage on the bus.
- ▶ The **Fault LED** indicates if a fault has been detected on the AS-Interface bus.
- ▶ The green and the red LEDs can be controlled as required by the control system via the bus using bits D1 and D2.

Plug connector M12
4-pin

Dimension drawing



Please order actuator and connection material separately.
For detailed information and suitable accessories, enter the order number for the product in the search box at www.euchner.com.

Ordering table

Series	Connection	Guard locking	Switching element	Order no./ item
STP-TW	SEM 4 Plug connector M12	3 Mechanical	SK: 1 NC ⊖ ÜK: 1 NC ⊖	102354 STP-TW-3A-4141AC024SEM4AS1
		4 Electrical	SK: 1 NC ⊖ ÜK: 1 NC ⊖	109813 STP-TW-4A-4141AC024SEM4AS1

Enabling switches ZSA and ZSB



- ▶ Housing G1
- ▶ 3-stage function
- ▶ Positively driven contacts
- ▶ Dual-channel version
- ▶ Optionally with two buttons (+ and -)



3-stage function

Enabling function is active only in the second stage (middle position, actuating point). Enabling is canceled when the button is released or pushed all the way down (panic function).

+ and - buttons

These buttons can be configured individually. For example, for moving axes in positive or negative direction.

AS-Interface inputs

- ▶ **DO, D1** NO contact E1
- ▶ **D2, D3** NO contact E2

Evaluation is performed via a safety monitor.

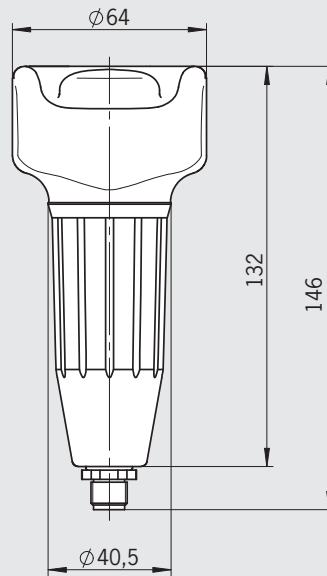
AS-Interface parameters

The buttons (+ and -) are transferred when the AS-i parameters are read out.

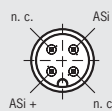
- ▶ **P0** Parameter bit, Plus button
- ▶ **P1** Parameter bit, Minus button

ZSA, 3-stage function Plug connector M12, 4-pin

Dimension drawings



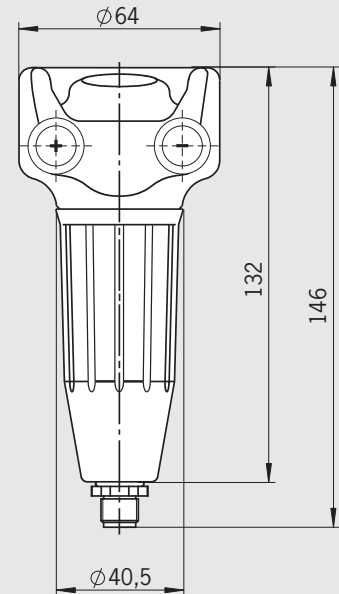
Connector assignment



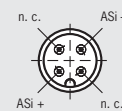
View of connection side

Please order actuator and connection material separately. For detailed information and suitable accessories, enter the order number for the product in the search box at www.euchner.com.

ZSB, 3-stage function Plug connector M12, 4-pin



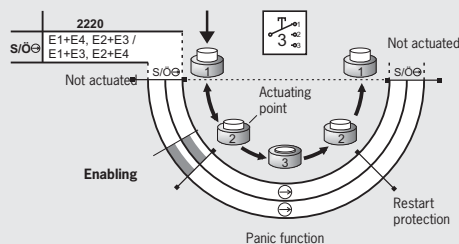
Connector assignment



View of connection side

Please order actuator and connection material separately. For detailed information and suitable accessories, enter the order number for the product in the search box at www.euchner.com.

Function sequence



Contact
 open
 closed
 closed, enabling

Ordering table

Series	Connection	Switching element	Switching element	Order no./ item
G1 3-stage	SEM 4 Plug connector M12	2 NO 3-stage		091580 ZSA2B2CAS1
			2 buttons (+ and -)	096703 ZSB2B7CAS1

Magnetically coded safety switch CMS...AS1



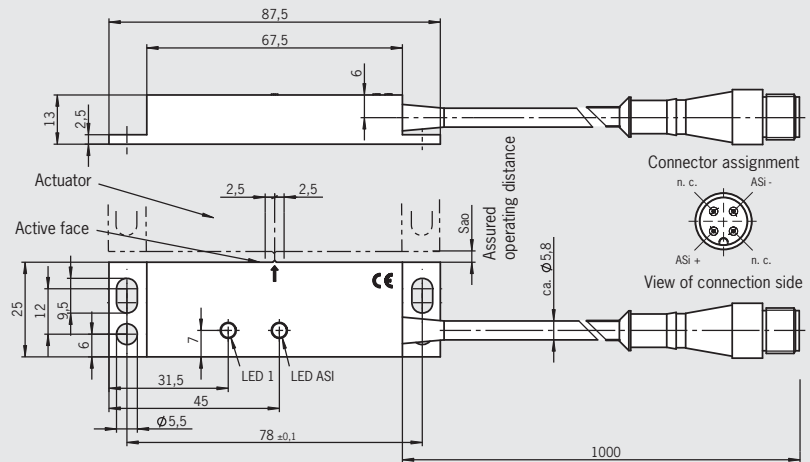
- ▶ Safety switch with integrated read head and integrated evaluation unit.
- ▶ LED diagnostic displays optional

Safety switch CMS-R-AZA-01PL-AS1/actuator CMS-M-AC

Plug connector M12, switch-on distance 9 mm



Dimension drawing



Actuator

An appropriate actuator to suit the safety switch selected is required. The dimensions of the actuators are the same as those of the safety switches, although the former have no connection cable.

AS-Interface inputs

- ▶ **D0 - D3** Switch actuated/open
- Evaluation is performed via a safety monitor.

AS-Interface outputs

- ▶ **D1** LED 1 on read head (only CMS-R-AZA...)

LED function display (only CMS-R-AZA...)

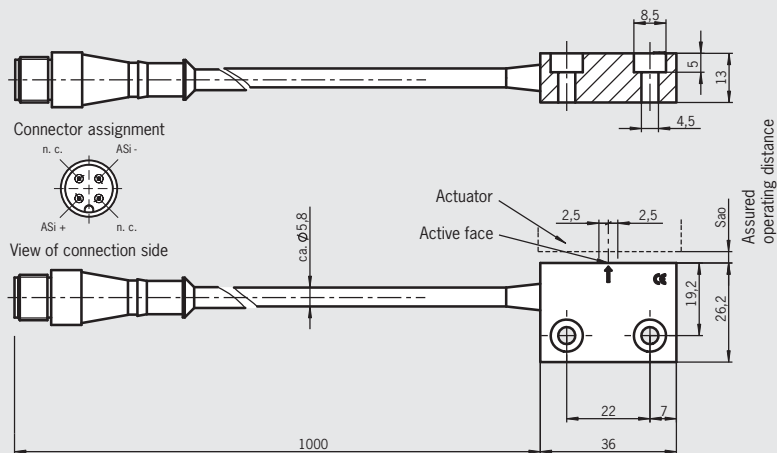
- ▶ The ASI LED (dual LED red/green) displays the colors red, green and yellow. The status of the switch and the bus is indicated via this LED.
- ▶ LED 1 can be connected via the AS-Interface bus, e.g. to indicate the door state.

Principle of operation

Reed contacts are installed in the CMS safety switch. The contact blades on the reed contacts are closed under the influence of the magnetic field from the actuator. The safety switch reacts only to a corresponding mating component, i.e. a certain actuator is assigned to each safety switch.

Safety switch CMS-R-BZB-01P-AS1/actuator CMS-M-BH

Plug connector M12, switch-on distance 7 mm



The dimensions of the actuators are the same as those of the safety switches, although the former have no connection cable.

Ordering table

Series	Connection	LED	Assured switch-on distance S_{ao} [mm]	Order no./ item	
				Safety switch	Related actuator
CMS	Connection cable PUR, length 1 m, with plug connector M12	•	9	105090 CMS-R-AZA-01PL-AS1	084592 CMS-M-AC
		–	7	105094 CMS-R-BZB-01P-AS1	092025 CMS-M-BH

Key adapter CKS...AS

- ▶ Key adapter with integrated CES read head
- ▶ Integrated diagnostics LEDs
- ▶ Up to category 4 / PL e according to EN ISO 13849-1

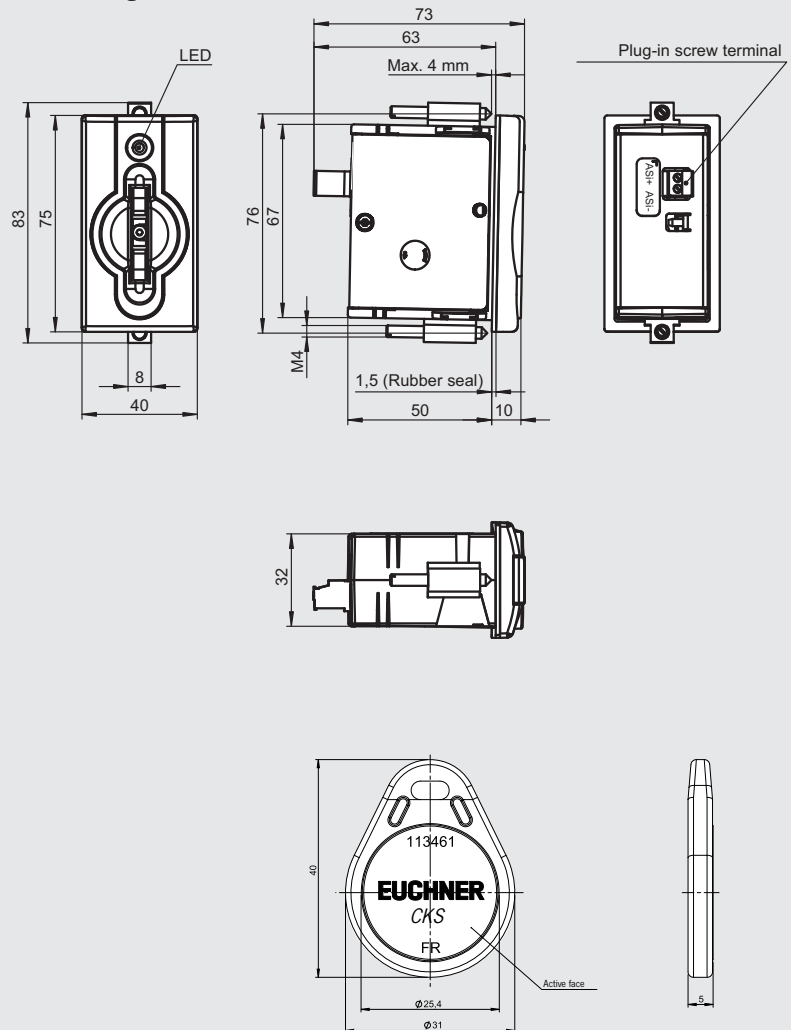


Key adapter CKS...AS

Plug-in screw terminal, 2-pin



Dimension drawing



Unicode evaluation

Each actuator is unique. The safety switch detects only the actuator that has been taught in. Additional actuators can be taught in. Only the last actuator taught in is detected.

AS-Interface inputs

- ▶ Key inserted: **D0, D1, D2, D3** Code sequence
- ▶ Key removed: **D0, D1, D2, D3** Zero sequence

Evaluation is performed via a safety monitor.

LED indicator

- ▶ Green: Key inserted
- ▶ Yellow: Readiness for operation
- ▶ Red: Fault

Ordering table

Series	Connection	Description	Order no./ item
CKS	Plug-in screw terminal, 2-pin	Key adapter CKS with AS-Interface	123592 CKS-K-AS2A-U-C20-PC-123592
		Key CKS, red	113461 CKS-A-BK1-RD-113461

Safety switch CES-AS-C04



- ▶ Very compact design with 3 active faces
- ▶ Integrated diagnostics LEDs
- ▶ Up to category 4 / PL e according to EN ISO 13849-1



Unicode evaluation

Each actuator is unique. The safety switch detects only the actuator that has been taught in. Additional actuators can be taught in. Only the last actuator taught in is detected.

Multicode evaluation

The safety switch recognizes all EUCHNER actuators as valid actuators.

AS-Interface inputs

- ▶ **D0 - D3** Door monitoring contact

Evaluation is performed via a safety monitor.

LED indicator

- ▶ STATE green
- ▶ DIA red

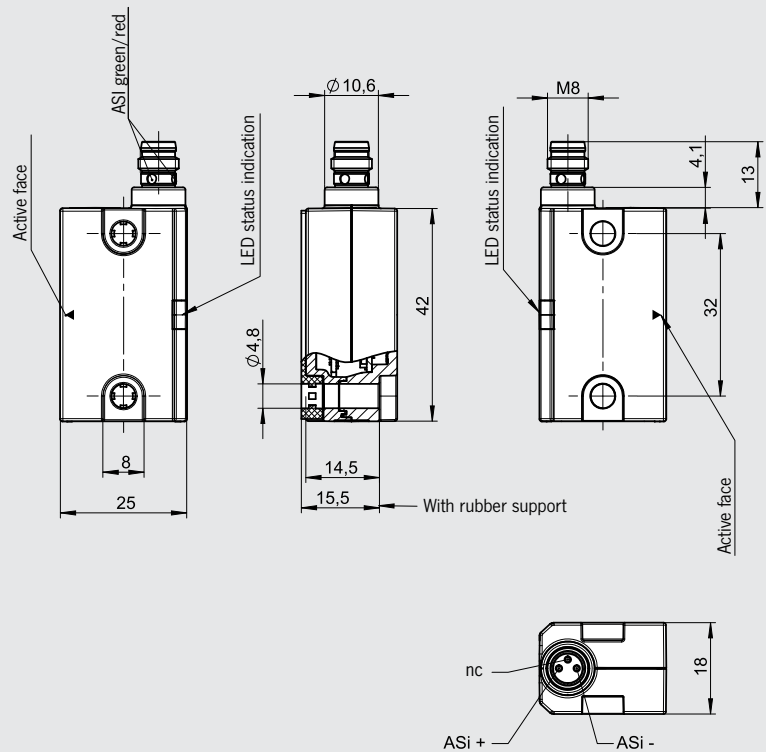
LED ASi in plug

- ▶ Green: Indicates operating voltage on the bus.
- ▶ Red: Indicates if a fault has been detected on the AS-Interface bus.

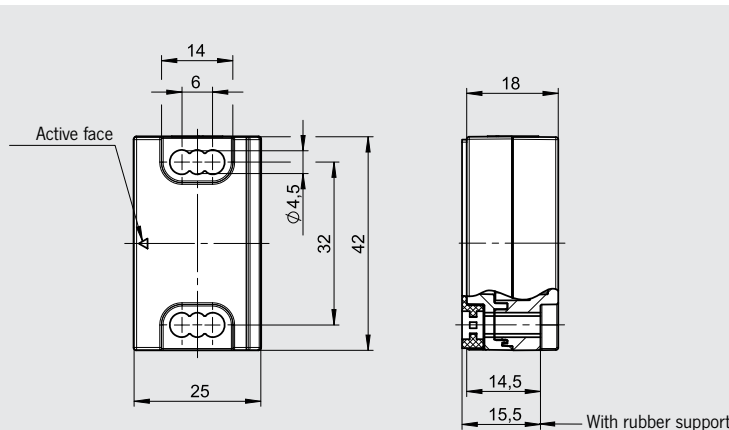
Safety switch CES-AS-C04

Plug connector M8, 3-pin

Dimension drawing



Actuator CES-A-BBN-C04



Ordering table

Series	Connection	Description	Coding	Order no./ item
CES	Plug connector M8, 3-pin	Safety switch with AS-Interface	Unicode	120547 CES+AS2A-U-C04-SC-120547
			Multicode	120546 CES+AS2A-M-C04-SC-120546
		Actuator		115271 CES-A-BBN-C04-115271

Safety switch CET with guard locking and guard lock monitoring



- ▶ Safety switch with guard locking and integrated evaluation electronics
- ▶ Locking force up to 6,500 N
- ▶ Up to category 4 / PL e according to EN ISO 13849-1



Unicode evaluation

Each actuator is unique. The safety switch detects only the actuator that has been taught in. Additional actuators can be taught in. Only the last actuator taught in is detected.

Multicode evaluation

The safety switch recognizes all EUCHNER actuators as valid actuators.

Guard locking types

CET3 Closed-circuit current principle, guard locking by spring force. Release by control of AS-i output 0.

CET4 Open-circuit current principle, guard locking by control of AS-i output 0. Release by spring force.

Control of the guard locking solenoid

The guard locking solenoid is controlled by the control system via AS-Interface bus bit D0.

AS-Interface inputs

- ▶ **D0, D1** Door monitoring
- ▶ **D2, D3** Guard lock monitoring

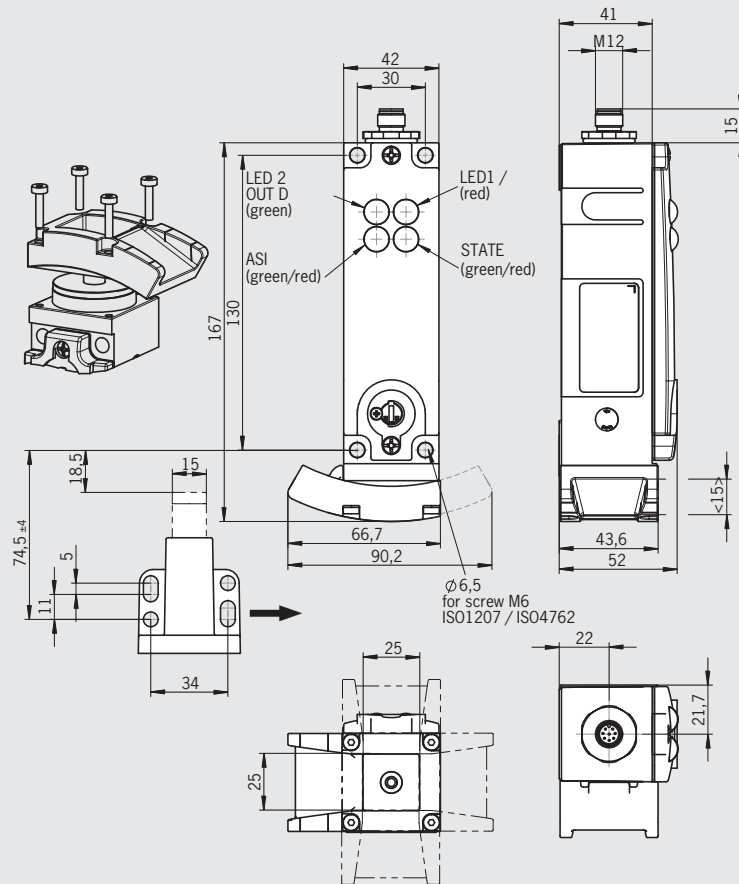
Evaluation is performed via a safety monitor.

AS-Interface outputs

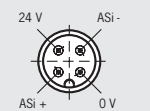
- ▶ **D0** Guard locking
- ▶ **D1** Red LED
- ▶ **D2** Green LED

Plug connector M12
4-pin

Dimension drawing



Connector assignment



View of connection side

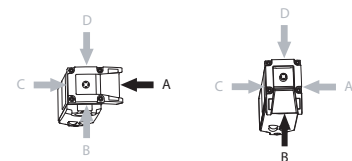
Please order actuator and connection material separately. For detailed information and suitable accessories, enter the order number for the product in the search box at www.euchner.com.

LED function display

- ▶ The ASI LED indicates the operating voltage on the bus.
- ▶ The State LED indicates if a fault has been detected on the AS-Interface bus.
- ▶ The green and the red LEDs can be controlled as required by the control system via the bus using bits D1 and D2.

Approach direction

- ▶ Horizontal
- ▶ Adjustable in 90° steps.



Ordering table

Series	Connection	Guard locking	Coding	Approach direction (state on delivery)	Order no./ item
CET	SEM 4 Plug connector M12	3 Mechanical	Multicode	A	116514 CET3-AS-CRA-CB-50X-1-116514
			Unicode		111214 CET3-AS-CRA-AB-50X-SJ-ASI-111214
		4 Electrical	Multicode	A	116515 CET4-AS-CRA-CB-50X-1-116515
			Unicode		113631 CET4-AS-CRA-AB-50X-SJ-ASI-113631
			Unicode	B	120008 CET4-AS-CRB-AB-50X-1-120008

Safety switch CET with guard locking and guard lock monitoring



- ▶ Safety switch with guard locking and integrated evaluation electronics
- ▶ Locking force up to 6,500 N
- ▶ Up to category 4 / PL e according to EN ISO 13849-1
- ▶ Lockout mechanism for up to three locks
- ▶ Escape release



Unicode evaluation

Each actuator is unique. The safety switch detects only the actuator that has been taught in. Additional actuators can be taught in. Only the last actuator taught in is detected.

Lockout mechanism

The lockout mechanism can be used to prevent maintenance personnel from being unintentionally locked in the danger area, for example. The lockout mechanism is not a safety function. This device with lockout mechanism possesses no auxiliary release.

Escape release (75 mm long)

This is used for manual release of guard locking from within the danger area without tools.

Guard locking type

CET4 Open-circuit current principle, guard locking by control of AS-i output 0. Release by spring force.

Control of the guard locking solenoid

The guard locking solenoid is controlled by the control system via AS-Interface bus bit D0.

AS-Interface inputs

- ▶ **D0, D1** Door monitoring
- ▶ **D2, D3** Guard lock monitoring

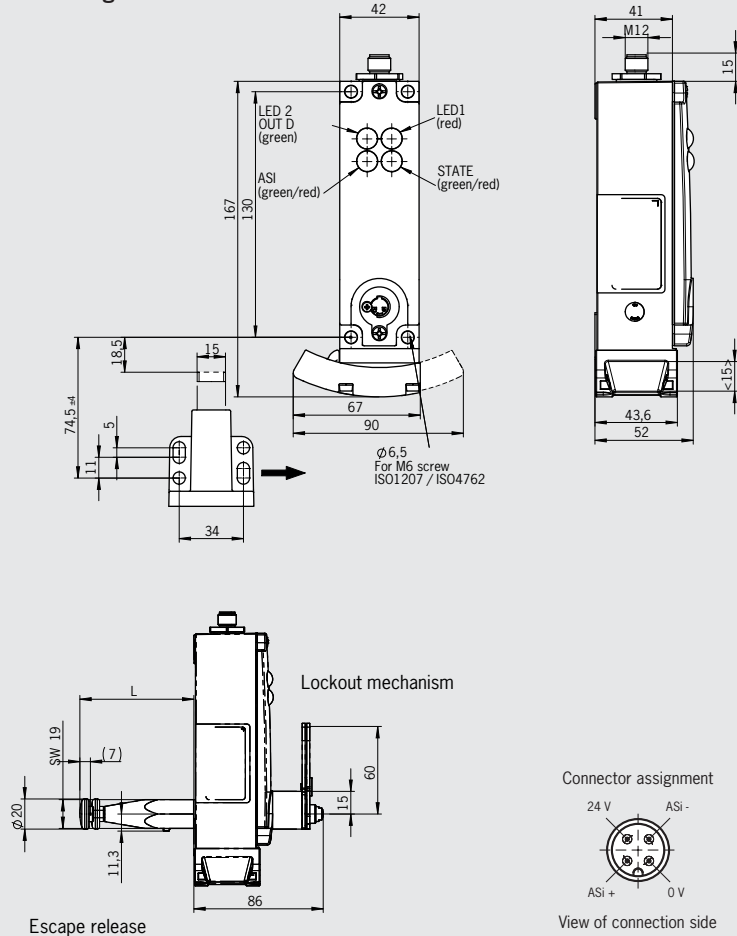
Evaluation is performed via a safety monitor.

AS-Interface outputs

- ▶ **D0** Guard locking
- ▶ **D1** Red LED
- ▶ **D2** Green LED

Plug connector M12 4-pin

Dimension drawing



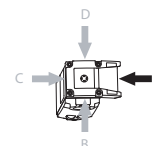
Please order actuator and connection material separately. For detailed information and suitable accessories, enter the order number for the product in the search box at www.euchner.com.

LED function display

- ▶ The ASI LED indicates the operating voltage on the bus.
- ▶ The State LED indicates if a fault has been detected on the AS-Interface bus.
- ▶ The green and the red LEDs can be controlled as required by the control system via the bus using bits D1 and D2.

Approach direction

- ▶ Horizontal
- ▶ Adjustable in 90° steps.



Ordering table

Series	Connection	Guard locking	Coding	Approach direction (state on delivery)	Order no./ item
CET	SEM 4 Plug connector M12	4 Electrical	Unicode	A	116420 CET4-AS-CRA-AB-50F-1-C2333-116420

Safety switch CTP with guard locking and guard lock monitoring



- ▶ Safety switch with guard locking and integrated evaluation electronics
- ▶ Locking force up to 2,600 N
- ▶ Up to category 4 / PL e according to EN ISO 13849-1



Unicode evaluation

Each actuator is unique. The safety switch detects only the actuator that has been taught in. Additional actuators can be taught in. Only the last actuator taught in is detected.

Escape release

This is used for manual release of guard locking from within the danger area without tools.

Guard locking types

CTP-L1 Closed-circuit current principle, Guard locking actuated by spring force applied and power-ON released.

CTP-L2 Open-circuit current principle, Guard locking actuated by power-ON applied and spring released.

Control of the guard locking solenoid

The guard locking solenoid can be controlled via AS-Interface bus bit D0 or via the auxiliary power.

AS-Interface inputs

- ▶ **D0, D1** Door monitoring
- ▶ **D2, D3** Guard lock monitoring

Evaluation is performed via a safety monitor.

AS-Interface outputs

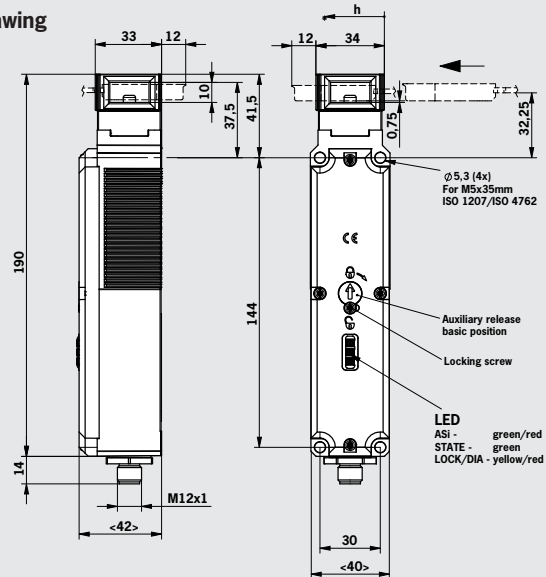
- ▶ **D0** Guard locking

LED function display

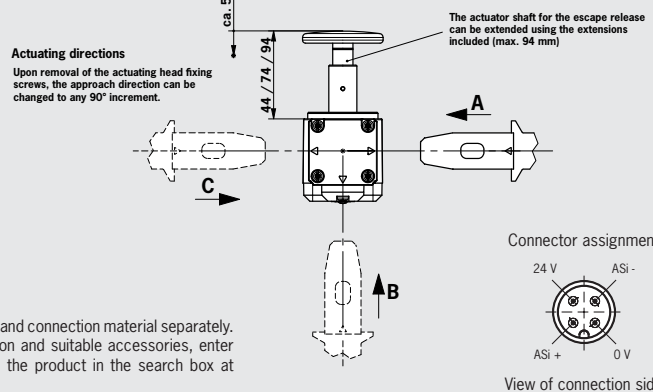
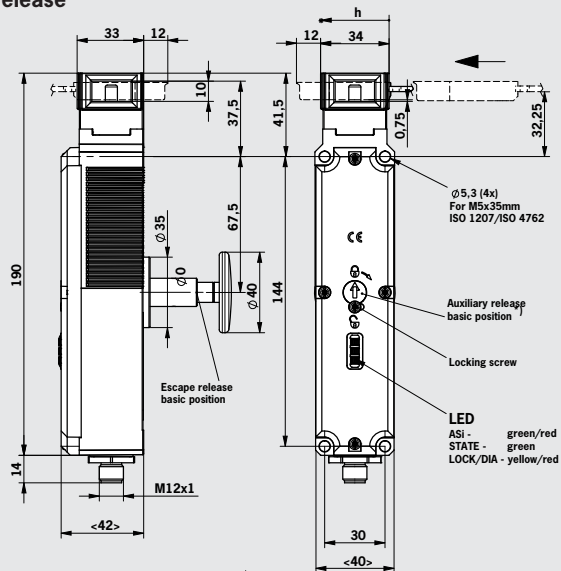
- ▶ The ASI LED indicates the state of the ASI bus.
- ▶ The STATE LED indicates the state of the switch.
- ▶ The LOCK/DIA LED indicates if the door is locked and whether a fault has been detected in the switch.

Plug connector M12 4-pin

Dimension drawing



With escape release



Please order actuator and connection material separately. For detailed information and suitable accessories, enter the order number for the product in the search box at www.euchner.com.

Ordering table

Series	Connection	Guard locking	Coding	Version	Order no./ item
CTP	SEM 4 Plug connector M12	1 Mechanical	Unicode		124987 CTP-L1-AS1B-UHA-AZ-SJ-124987
				with escape release	126644 CTP-L1-AS1B-UHA-AE-SJ-126644
		2 Electrical	Unicode		124988 CTP-L2-AS1B-UHA-AZ-SJ-124988



Safety Basis Monitor SBM

- ▶ Four safe inputs, two safe semiconductor outputs
- ▶ AS-i monitor, master and connection for 24V power supply unit (AS-interface Power 24V) integrated
- ▶ Chip card and USB for parameter assignment



AS-i master

The SBM includes an AS-i Master, which can be switched off as an option. This permits several SBMs to be operated on an AS-Interface circuit. Configuration is performed with a PC. LEDs signal the state on the device.

OSSDs (Output Signal Switching Devices)

- ▶ Two OSSDs (Output Signal Switching Devices) with semiconductor outputs
- ▶ 14 additional safe AS-i outputs can be controlled

Safe inputs

There are four safe inputs to which safety devices without AS-i bus can be directly connected. The inputs can be optionally used as standard inputs/monitoring outputs, e.g. for feedback loop or start button.

Logic functions

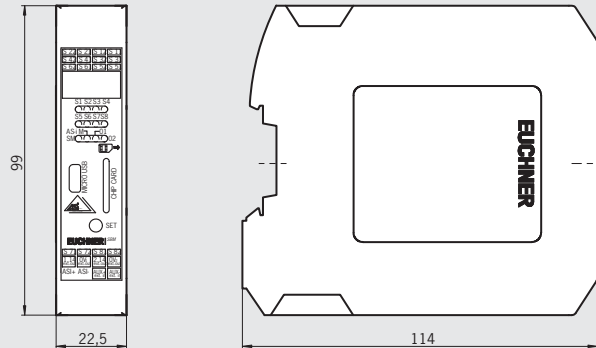
Programmable with AsiMon software. All safety components can be programmed with different functions as inputs. The inputs can be linked with AND or OR gates or via logic functions such as Flip Flop, switch-on delay, turn-off delay or pulses. Different programs can be stored on memory cards.

AS-Interface monitor

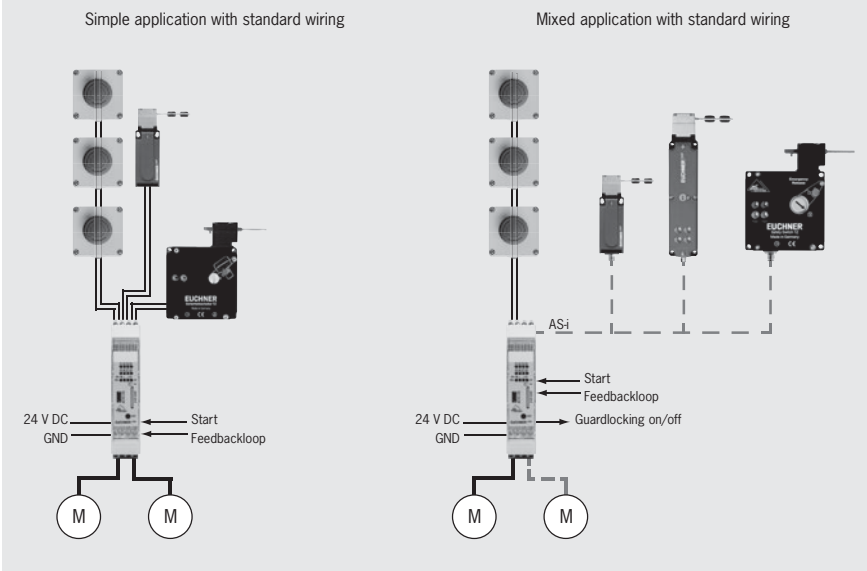
The monitor controls one AS-i circuit with up to 31 safe slaves and up to 16 OSSDs, of which two are built into the device. 14 circuits can be used externally in addition.

Safety Basis Monitor SBM

Dimension drawing



Block diagrams



Ordering table

Series	Inputs	Number of AS-i OSSDs	Order no./ item
SBM	4	2 internal, 14 external	113830 SBM-11-N08

AS-Interface Safety at Work safety monitors SFM



- ▶ Dual-channel
- ▶ Start inputs
- ▶ Monitoring outputs
- ▶ Adjustable time-delay



OSSD (Output Signal Switching Device)
SFM-...2: Two OSSDs with four normally closed contacts

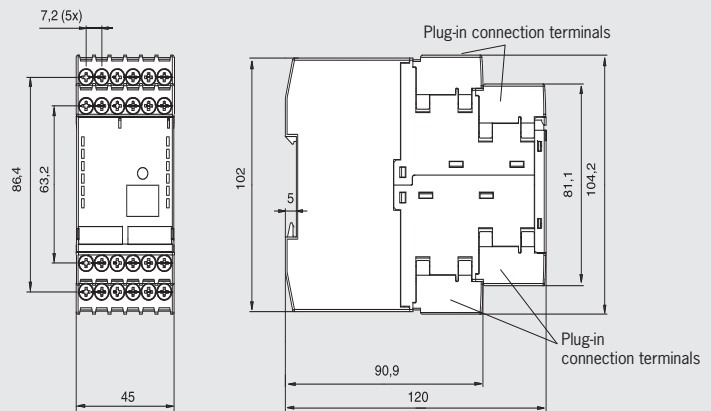
Auxiliary contacts
 One auxiliary contact per channel.

Inputs
 One start input per channel and one feedback loop per channel. Freely usable on SFM-B...

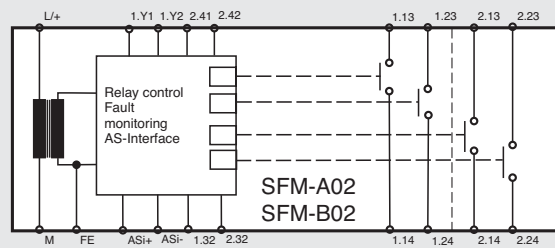
Logic functions
 Programmable with AsiMon software. All safety components can be programmed with different functions as inputs. The inputs can be linked with AND or OR gates.
 With the monitors SFM-B..., additional logic functions such as FlipFlop, switch-on delay, turn-off delay or pulses are available. The number of links and the memory depth are larger than on the SFM-A... devices.

Safety monitors SFM

Dimension drawing



Block diagram



for connector assignment, see technical data on page 51

Ordering table

Series	Version	Number of AS-i outputs	Channels	Order no./ item
SFM	A Standard	0	2	085639 SFM-A02
	B Expanded	0	2	087891 SFM-B02

AS-Interface Safety at Work safe output SOM



- ▶ 1 redundant OSSD
- ▶ Control by GMOx
- ▶ Control by machine control
- ▶ Up to 4 inputs
- ▶ Diagnostics via AS-Interface



OSSD (Output Signal Switching Device)

The OSSD is of redundant design according to category 4 EN ISO 13849-1. Safety-related control is via the bus by a suitable monitor, for example by a GMOx. Operational switching is also possible directly by the control system with appropriate parameter settings.

Inputs and outputs

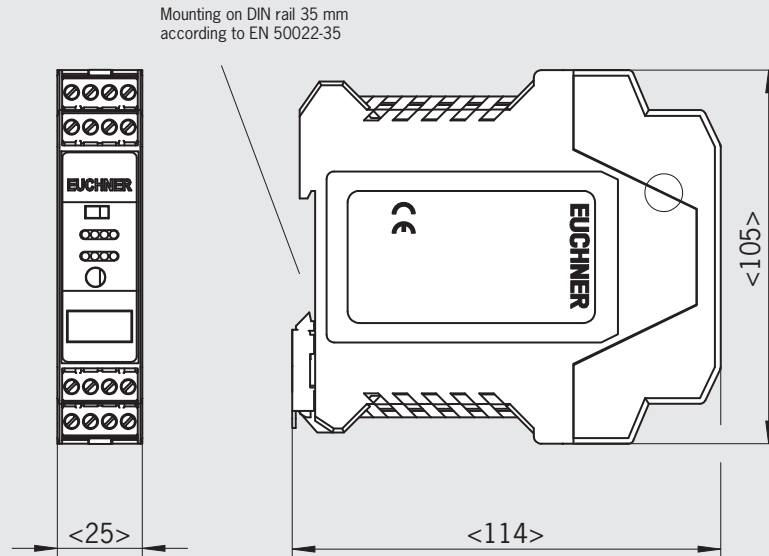
A feedback loop can be connected directly to the SOM. Depending on the parameter settings, further inputs and outputs can also be used.

LED function display

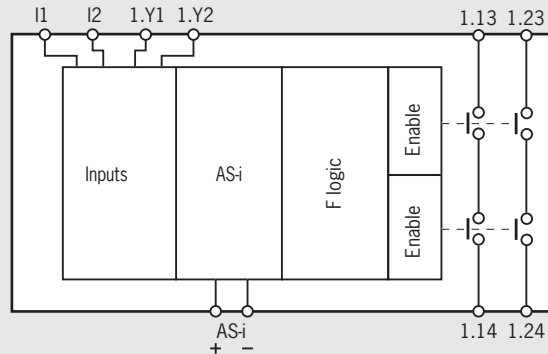
- ▶ **PWR** Green, AS-Interface power
- ▶ **ASi** Red, bus communication
- ▶ **OUT** Yellow, state of OSSD
- ▶ **ALARM** Red, can be set as required by control system
- ▶ **I1...I3** State of the related input
- ▶ **1.Y1** State of the input

Safe output SOM

Dimension drawing



Block diagram



Ordering table

Series	Inputs	Outputs	OSSDs (Output Signal Switching Devices)	Order no./ item
SOM	4	0	1	103489 SOM-4E-0A-C1

AS-Interface Safety at Work safety monitor with integrated gateway GMOx



- ▶ One or two AS-i masters
- ▶ Display and buttons for diagnostics and adjustment
- ▶ Memory card for different programs
- ▶ Adjustable time-delay
- ▶ 16 OSSDs



Gateway to Profibus

For connection to a Profibus DP as a slave and as a master for one or two AS-i buses according to specification 3.0. Detection of ground shunt, double addressing and EMC problems. Rapid commissioning with the display without PC. Direct display of faults with plain-text messages. Comprehensive AS-i diagnostics integrated. AS-i configuration software is available.

OSSDs (Output Signal Switching Devices), AS-i outputs

- ▶ Two OSSDs (Output Signal Switching Devices) with two redundant normally closed contacts each
- ▶ Two OSSDs (Output Signal Switching Devices) with semiconductor outputs
- ▶ 12 additional safe AS-i outputs can be controlled

Inputs

- ▶ 4 inputs, freely selectable

Logic functions

Programmable with AsiMon software. All safety components can be programmed with different functions as inputs. The inputs can be linked with AND or OR gates or via logic functions such as FlipFlop, switch-on delay, turn-off delay or pulses. Different programs can be stored on a memory card.

AS-Interface monitor

The monitor controls two AS-i circuits with up to 62 safe slaves and up to 16 outputs.

Display and buttons

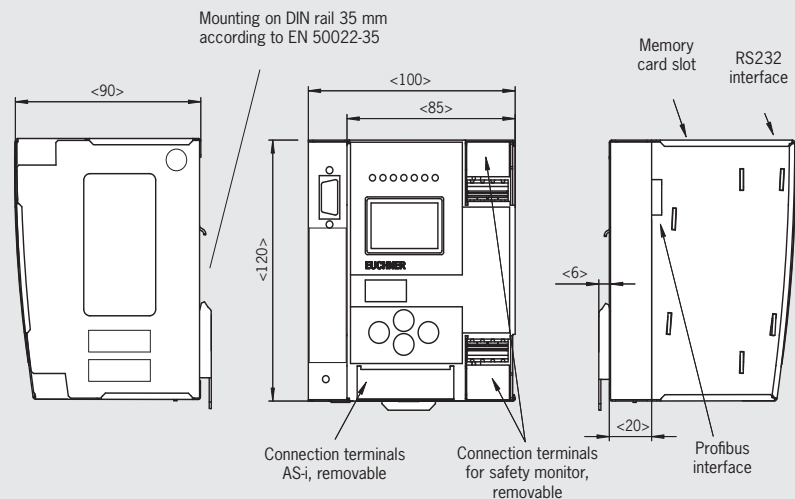
The display is used to operate the gateway functionality as well as the monitor at the same time. The diagnostics and maintenance functions are considerably expanded compared to the SFM monitors. They can also be launched on the display without a PC monitor. Incorporated security functions allow the programmed functionality to be protected and monitored.

Ordering table

Series	Bus connection	AS-i master	Number of AS-i outputs	OSSDs (Output Signal Switching Devices)	Order no./ item
GMOx	PR Profibus	1	16	4 + 12 external	103267 GMOX-PR-12DN-C16
		2	16	4 + 12 external	103302 GMOX-PR-22DN-C16

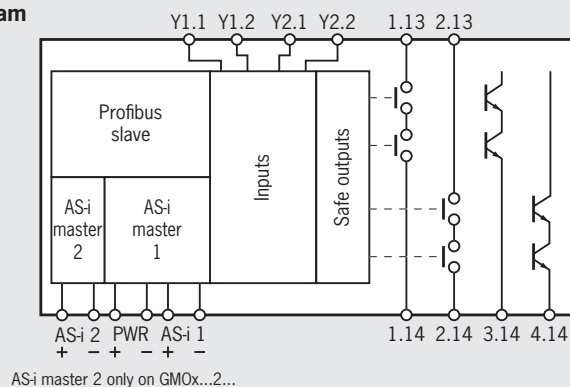
Safety monitor GMOx

Dimension drawing



Please order connection kit separately; see page 31

Block diagram



for connector assignment, see technical data on page 53

Important: One connection set must be ordered for each safety monitor (see page 31).

Accessories

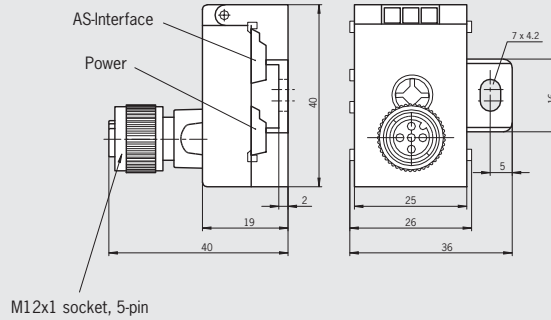
- ▶ Passive bus coupling module BCM-A-P2...



For connection of components with integrated AS-Interface and M12 plug connector to the AS-Interface ribbon cables. Both the bus and auxiliary power are converted from the ribbon cable to an M12 socket. The coupling module is suitable for safety components and for standard components. It is particularly suitable for EUCHNER safety switches with guard locking.

Passive bus coupling module BCM-A-P2...

Dimension drawing



Ordering table

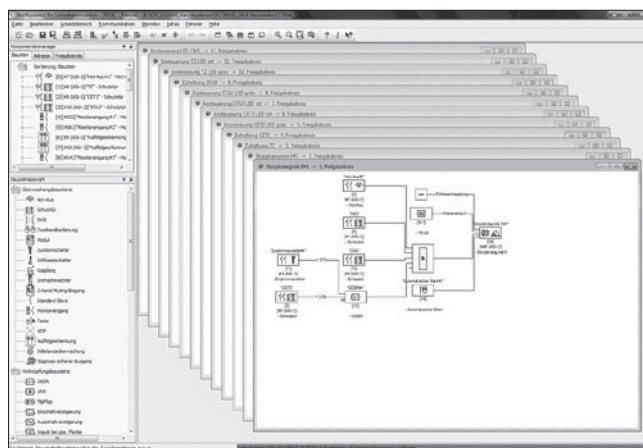
Version	Connections	Order no./ item
BCM-A-P2	AS-Interface ribbon cable, auxiliary power ribbon cable M12 socket	105756 BCM-A-P2-SEM4-1
Connection cable M12 with straight plug connectors, length 1 m, PUR		089420 Connection cable M12

Accessories and software for monitors SBM, SFM and GMOx

The software is required for programming the EUCHNER safety monitors. All safety monitors can be programmed with the same software. A Windows®-equipped PC is required. All Safety at Work manuals in various languages are included on the CD.

A cable set SFM or the cable set GMOx is required to connect the PC. The cable set SFM includes a transfer cable for direct read-out from monitor to monitor.

Additional memory cards can be ordered for the gateway monitors GMOx. Plug-in connections with screw terminals and cage-clamp terminals are available.



Ordering table

Version	Suitability	Order no./ item
AsiMon Configuration software	For all AS-Interfaces Safety at Work safety monitors	088053 AsiMon SW
Cable set SFM ¹⁾	For all monitors SFM...	087299 Cable set SFM
Connection kit Cage-clamp terminals GMOx	Gateway monitors GMOx	100256 ZMO-ZB-KK8-M
Connection kit Cage-clamp terminals ESM-F	4 pcs. For monitors SBM	097195 ESM-F-KK4
Programming cable GMOx	Gateway monitors GMOx	100437 ZMO-ZB-PGK
USB connecting cables SBM	For monitors SBM	113832 SBM-ZB-PGK
1 memory card	Gateway monitors GMOx	103580 ZMO-ZB-MB1
	For monitors SBM	100875 ZMO-ZB-MB10

1) For programming and exchange

Position switch NZ

HS



RS



Reliability values acc. to EN ISO 13849-1

Parameter	Value	Unit
B10d	2 x 10 ⁷ operating cycles	

Switch



Parameter	Value		Unit
Housing material	Anodized die-cast alloy		
Mechanical life	30 x 10 ⁶ operating cycles		
Ambient temperature	- 25 ... + 70		°C
Degree of contamination (external, according to EN 60947-1)	3 (industrial)		
Installation position	Any		
Weight	Approx. 0.35		kg
Approach speed, max. ¹⁾ , depending on actuator	HS 60	RS 20	m/min
Approach speed, min.	0.1	0.1	m/min
Actuating force, min.	30	30	N

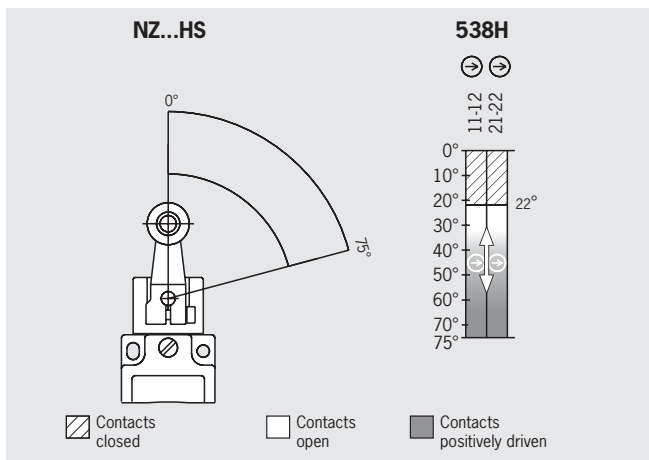
AS-Interface connection



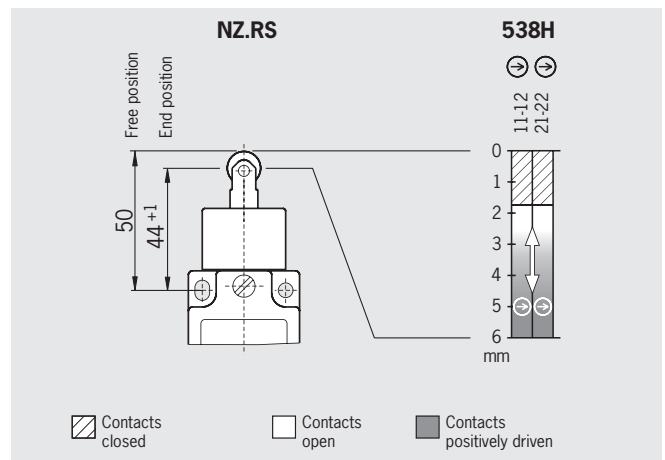
Parameter	Value		Unit
Connection	Plug connector		
Version	M12 (4-pin)		
Degree of protection acc. to IEC 60529	IP 67 ²⁾		
Switching principle	Slow-action switching contact 2 NC ⊖		
EMC protection requirements	Acc. to EN 50295 (AS-Interface standard) and IEC 62026		
AS-Interface data			
Acc. to AS-Interface specification 2.1	EA code: 7	ID code: B	
Operating voltage, AS-Interface	22.5 ... 31.6		V DC
Total current consumption, max.	45		mA
Valid AS-Interface addresses	1 - 31		
AS-Interface inputs			
Acc. to AS-Interface Safety at Work			
Positively driven contact 1	D0, D1		
Positively driven contact 2	D2, D3		
AS-Interface outputs			
D0 and D3	Not used		
D1	Red LED, 1 = LED on		
D2	Green LED, 1 = LED on		
AS-Interface Power LED	Green, AS-Interface Power on		
AS-Interface Fault LED	Red, offline phase or address 0		

- 1) The approach speed given applies in conjunction with EUCHNER trip dogs at an approach angle of 30°. At a smaller approach angle this approach speed can be exceeded.
 2) Screwed tight with the related plug connector

Travel diagram
NZ.HS



Travel diagram
NZ.RS



Safety switch NZ.VZ



Reliability values acc. to EN ISO 13849-1

Parameter	Value	Unit
B10d	4.5 x 10 ⁶ operating cycles	

Switch



Parameter	Value	Unit
Housing material	Anodized die-cast alloy	
Mechanical life	2 x 10 ⁶ operating cycles	
Ambient temperature	-25 ... +70	°C
Weight	Approx. 0.3	kg
Approach speed, max.	20	m/min
Approach speed, min.	0.1	m/min
Actuating force	35	N
Extraction force	35	N
Retention force	8	N

AS-Interface connection



Parameter	Value	Unit
Connection	Plug connector	
Version	M12 (4-pin)	
Degree of protection acc. to IEC 60529	IP 67 ²⁾	
Switching principle	Slow-action switching contact 2 NC ⊖	
EMC protection requirements	Acc. to EN 50295 (AS-Interface standard) and IEC 62026	
AS-Interface data		
Acc. to AS-Interface specification 2.1	EA code: 7	ID code: B
Total current consumption, max.	45	mA
Valid AS-Interface addresses	1 - 31	
AS-Interface inputs		
Acc. to AS-Interface Safety at Work		
Positively driven contact 1	D0, D1	
Positively driven contact 2	D2, D3	
AS-Interface outputs		
D0 and D3	Not used	
D1	Red LED, 1 = LED on	
D2	Green LED, 1 = LED on	
AS-Interface Power LED	Green, AS-Interface Power on	
AS-Interface Fault LED	Red, offline phase or address 0	

2) Screwed tight with the related plug connector

Safety switch TZ with guard locking and guard lock monitoring



Reliability values acc. to EN ISO 13849-1

Parameter	Value	Unit
B10d	3 x 10 ⁶ operating cycles	

Switch



Parameter	Value	Unit
Housing material	Anodized die-cast alloy	
Mechanical life	1 x 10 ⁶ operating cycles	
Ambient temperature	- 25 ... + 55	°C
Weight	Approx. 1.2	kg
Approach speed, max.	20	m/min
Actuating force	35	N
Extraction force	30	N
Retention force	10	N
Locking force, max.	2,000	N
Locking force F _{ZH} acc. to EN ISO 14119	1,500	N
Guard locking solenoid		
Solenoid operating voltage (auxiliary voltage on black AS-Interface cable)	24 V +10/-15% Power supply unit with electrical isolation (IEC 60742, PELV)	V DC
Solenoid operating current	350	mA
Duty cycle	100	%

AS-Interface connection



Parameter	Value	Unit
Connection	Plug connector	
Version	M12 (4-pin)	
Degree of protection acc. to IEC 60529	IP 67 ²⁾	
Switching principle SK, UK	Slow-action switching contact 1 NC contact each ☹	
EMC protection requirements	Acc. to EN 50295 (AS-Interface standard) and IEC 62026	
AS-Interface data		
Acc. to AS-Interface specification 2.1	EA code: 7 ID code: B	
Total current consumption, max.	45	mA
Valid AS-Interface addresses	1 - 31	
AS-Interface inputs		
Positively driven contact 1	D0, D1	
Positively driven contact 2	D2, D3	
AS-Interface outputs		
D0	Guard locking solenoid, 1 = solenoid energized	
D1	Red LED, 1 = LED on	
D2	Green LED, 1 = LED on	
AS-Interface Power LED	Green, AS-Interface Power on	
AS-Interface Fault LED	Red, offline phase or address 0	

2) Screwed tight with the related plug connector

Safety switch NX



Reliability values acc. to EN ISO 13849-1

Parameter	Value	Unit
B10d	4.5 x 10 ⁶ operating cycles	

Switch



Parameter	Value	Unit	
Housing material	Die-cast alloy, cathodically dipped		
Mechanical life	2 x 10 ⁶ operating cycles		
Ambient temperature	- 20 ... + 70	°C	
Weight	Approx. 0.4	kg	
Approach speed, max.	20	m/min	
Actuating force	40	N	
Extraction force	50	N	
Retention force	10	N	
Insertion depth	Standard actuator	Overtravel actuator	
Required insertion depth s_{min}	32	32	mm
Maximum insertion depth s_{max}	33	40	mm
Actuator travel (in the locked state)	6	13	mm

AS-Interface connection



Parameter	Value	Unit
Connection	Plug connector	
Version	M12 (4-pin)	
Degree of protection acc. to IEC 60529	IP 67 ²⁾	
Switching principle	Slow-action switching contact 2 NC ⊖	
EMC protection requirements	Acc. to EN 50295 (AS-Interface standard) and IEC 62026	
AS-Interface data		
Acc. to AS-Interface specification 2.1	EA code: 7	ID code: B
Total current consumption, max.	45	mA
Valid AS-Interface addresses	1 - 31	
AS-Interface inputs		
Positively driven contact 1	D0, D1	
Positively driven contact 2	D2, D3	
AS-Interface outputs		
D0 and D3	Not used	
D1	Red LED, 1 = LED on	
D2	Green LED, 1 = LED on	
AS-Interface Power LED	Green, AS-Interface Power on	
AS-Interface Fault LED	Red, offline phase or address 0	


2) Screwed tight with the related plug connector


Safety switch TX with guard locking and guard lock monitoring



Reliability values acc. to EN ISO 13849-1

Parameter	Value	Unit
B10d	6 x 10 ⁶ operating cycles	

Switch		Value		Unit
Parameter				
Housing material		Die-cast alloy, cathodically dipped		
Mechanical life		> 1 x 10 ⁶ operating cycles		
Ambient temperature		- 20 ... + 50		°C
Weight		Approx. 0.8		kg
Degree of contamination (external, acc. to EN 60947-1)		3 (industrial)		
Installation position		Any		
Approach speed, max.		20		m/min
Actuation frequency		1,200		1/h
Actuating force		35		N
Extraction force		35		N
Retention force		20		N
Locking force, max.		1,700		N
Locking force F _{zh} acc. to EN ISO 14119		1,300		N
Insertion depth		Standard actuator	Overtravel actuator	
Required insertion depth S _{min}		32	32	mm
Maximum insertion depth S _{max}		33	40	mm
Actuator travel (in the locked state)		6	13	mm
Guard locking solenoid				
Solenoid operating voltage (auxiliary voltage on black AS-Interface cable)		24 V +10/-15% Power supply unit with electrical isolation (IEC 60742, PELV)		V DC
Solenoid operating current		300		mA
Duty cycle		100		%

AS-Interface connection		Value		Unit
Parameter				
Connection		Plug connector		
Version		M12 (4-pin)		
Degree of protection acc. to IEC 60529		IP 67 ²⁾		
Switching principle		Slow-action switching contact 2 NC ⊖		
EMC protection requirements		Acc. to EN 50295 (AS-Interface standard) and IEC 62026		
AS-Interface data				
Acc. to AS-Interface specification 2.1		EA code: 7	ID code: B	
Operating voltage, AS-Interface		22.5 ... 31.6		V DC
Total current consumption, max.		45		mA
Valid AS-Interface addresses		1 - 31		
AS-Interface inputs				
Acc. to AS-Interface Safety at Work				
Door monitoring contact SK		D0, D1		
Solenoid monitoring contact UK		D2, D3		
AS-Interface outputs				
D0		Guard locking solenoid, 1 = solenoid energized		
D1		Red LED, 1 = LED on		
D2		Green LED, 1 = LED on		
AS-Interface Power LED		Green, AS-Interface Power on		
AS-Interface Fault LED		Red, offline phase or address 0		

2) Screwed tight with the related plug connector

Safety switch STA with guard locking and guard lock monitoring



Reliability values acc. to EN ISO 13849-1

Parameter	Value	Unit
B10d	11.5 x 10 ⁶ operating cycles	

Switch



Parameter	Value	Unit	
Housing material	Die-cast alloy		
Mechanical life	1 x 10 ⁶ operating cycles		
Ambient temperature	- 20 ... + 55	°C	
Weight	Approx. 0.6	kg	
Degree of contamination (external, acc. to EN 60947-1)	3 (industrial)		
Installation position	Any		
Approach speed, max.	20	m/min	
Actuation frequency	1,200	1/h	
Actuating force	35	N	
Extraction force (not locked)	30	N	
Retention force	20	N	
Locking force	Max. 3,000	N	
Locking force F _{2h} acc. to EN ISO 14119	2,300	N	
Insertion depth (minimum required travel + permissible overtravel)	Actuator S standard	Actuator L for insertion funnel	
Lateral approach direction (h)	24.5 + 5	28.5 + 5	mm
Approach direction from above (v)	24.5 + 5	28.5 + 5	mm
Guard locking solenoid			
Solenoid operating voltage (auxiliary voltage on black AS-Interface cable)	24 +10/-15% Power supply unit with electrical isolation (IEC 60742, PELV)	V DC	
Solenoid operating current	300	mA	
Duty cycle	100	%	

AS-Interface connection



Parameter	Value	Unit
Connection	Plug connector	
Version	M12 (4-pin)	
Degree of protection acc. to IEC 60529	IP 67 ²⁾	
Switching principle	Slow-action switching contact 1 NC contact each ⇄	
EMC protection requirements	Acc. to EN 50295 (AS-Interface standard) and IEC 62026	
AS-Interface data		
Acc. to AS-Interface specification 2.1	EA code: 7	ID code: B
Operating voltage, AS-Interface	22.5 ... 31.6	V DC
Total current consumption, max.	45	mA
Valid AS-Interface addresses	1 - 31	
AS-Interface inputs		
Door monitoring contact SK	D0, D1	
Solenoid monitoring contact UK	D2, D3	
AS-Interface outputs		
D0	Guard locking solenoid, 1 = solenoid energized	
D1	Red LED, 1 = LED on	
D2	Green LED, 1 = LED on	
AS-Interface Power LED	Green, AS-Interface Power on	
AS-Interface Fault LED	Red, offline phase or address 0	

2) Screwed tight with the related plug connector

Safety switch GP



Reliability values acc. to EN ISO 13849-1

Parameter	Value	Unit
B10d	3 x 10 ⁶ operating cycles	

Switch



Parameter	Value		Unit
Housing material	Reinforced thermoplastic		
Mechanical life	2 x 10 ⁶ operating cycles		
Ambient temperature	- 20 ... + 55		°C
Weight	Approx. 0.16		kg
Approach speed, max.	20		m/min
Actuating force	10		N
Extraction force	20		N
Retention force	2		N
Insertion depth (minimum required travel + permissible overtravel)	Actuator S standard	Actuator L overtravel	
Lateral approach direction (h)	28 + 2	28 + 7	mm
Approach direction from above (v)	29.5 + 1.5	29.5 + 7	mm

AS-Interface connection



Parameter	Value		Unit
Connection	Plug connector		
Version	M12 (4-pin)		
Degree of protection acc. to IEC 60529	IP 67 ²⁾		
Switching principle	Slow-action switching contact 2 NC ⇄		
EMC protection requirements	Acc. to EN 50295 (AS-Interface standard) and IEC 62026		
AS-Interface data			
Acc. to AS-Interface specification 2.1	EA code: 7	ID code: B	
Total current consumption, max.	45		mA
Valid AS-Interface addresses	1 - 31		
AS-Interface inputs			
Acc. to AS-Interface Safety at Work			
Positively driven contact 1	D0, D1		
Positively driven contact 2	D2, D3		
AS-Interface Power LED	Green, AS-Interface Power on		
AS-Interface Fault LED	Red, offline phase or address 0		

2) Screwed tight with the related plug connector

Safety switch SGP



Reliability values acc. to EN ISO 13849-1

Parameter	Value	Unit
B10d	3 x 10 ⁶ operating cycles	

Switch



Parameter	Value	Unit
Material	Housing Reinforced thermoplastic	
	Actuating head Die-cast aluminum	
	Cam in actuating head Stainless steel	
Mechanical life	2 x 10 ⁶ operating cycles	
Ambient temperature	- 20 ... + 55	°C
Weight	Approx. 0.16	kg
Approach speed, max.	20	m/min
Actuating force	25	N
Extraction force	25	N
Retention force	10	N
Insertion depth (minimum required travel + permissible overtravel)	Actuator S standard Actuator L for insertion funnel	
Lateral approach direction (h)	24.5 + 5	mm
Approach direction from above (v)	24.5 + 5	mm

AS-Interface connection



Parameter	Value	Unit
Connection	Plug connector	
Version	M12 (4-pin)	
Degree of protection acc. to IEC 60529	IP 67 ²⁾	
Switching principle	Slow-action switching contact 2 NC ⊖	
EMC protection requirements	Acc. to EN 50295 (AS-Interface standard) and IEC 62026	
AS-Interface data		
Acc. to AS-Interface specification 2.1	EA code: 7	ID code: B
Total current consumption, max.	45	mA
Valid AS-Interface addresses	1 - 31	
AS-Interface inputs		
Acc. to AS-Interface Safety at Work		
Positively driven contact 1	D0, D1	
Positively driven contact 2	D2, D3	
AS-Interface Power LED	Green, AS-Interface Power on	
AS-Interface Fault LED	Red, offline phase or address 0	

2) Screwed tight with the related plug connector

Safety switch TP with guard locking and guard lock monitoring



Reliability values acc. to EN ISO 13849-1

Parameter	Value	Unit
B10d	3 x 10 ⁶ operating cycles	

Switch



Parameter	Value	Unit	
Housing material	Reinforced thermoplastic		
Mechanical life	1 x 10 ⁶ operating cycles		
Ambient temperature	- 20 ... + 55	°C	
Weight	Approx. 0.5	kg	
Approach speed, max.	20	m/min	
Actuating force	10	N	
Extraction force (not locked)	20	N	
Retention force	10	N	
Locking force, max.	1,300	N	
Locking force F _{zh} acc. to EN ISO 14119	1,000	N	
Insertion depth (minimum required travel + permissible overtravel)	Actuator S standard	Actuator L for insertion funnel	
Lateral approach direction (h)	28 + 2	28 + 7	mm
Approach direction from above (v)	29.5 + 1.5	-	mm
Guard locking solenoid			
Solenoid operating voltage (auxiliary voltage on black AS-Interface cable)	24 V +10/-15% Power supply unit with electrical isolation (IEC 60742, PELV)	V DC	
Solenoid operating current	300	mA	
Duty cycle	100	%	

AS-Interface connection



Parameter	Value	Unit
Connection	Plug connector	
Version	M12 (4-pin)	
Degree of protection acc. to IEC 60529	IP 67 ²⁾	
Switching principle	Slow-action switching contact 1 NC contact each ⊖	
EMC protection requirements	Acc. to EN 50295 (AS-Interface standard) and IEC 62026	
AS-Interface data		
Acc. to AS-Interface specification 2.1	EA code: 7	ID code: B
Total current consumption, max.	45	mA
Valid AS-Interface addresses	1 - 31	
AS-Interface inputs		
Acc. to AS-Interface Safety at Work		
Version AS1	D0, D1	▶ Door monitoring contact SK
	D2, D3	▶ Solenoid monitoring contact ÜK
Version AS2	D0, D1	▶ Positively driven contact SK 1
	D2, D3	▶ Positively driven contact SK 2
AS-Interface outputs		
D0	Guard locking solenoid, 1 = solenoid energized	
D1	Red LED, 1 = LED on	
D2	Green LED, 1 = LED on	
AS-Interface Power LED	Green, AS-Interface Power on	
AS-Interface Fault LED	Red, offline phase or address 0	

2) Screwed tight with the related plug connector

Safety switch STP with guard locking and guard lock monitoring



Reliability values acc. to EN ISO 13849-1

Parameter	Value	Unit
B10d	5 x 10 ⁶ operating cycles	

Switch



Parameter	Value	Unit
Material	Housing Actuating head Cam in actuating head	Reinforced thermoplastic Die-cast aluminum Stainless steel
Mechanical life	1 x 10 ⁶ operating cycles	
Ambient temperature	- 20 ... + 55	°C
Weight	Approx. 0.5	kg
Degree of contamination (external, acc. to EN 60947-1)	3 (industrial)	
Installation position	Any	
Approach speed, max.	20	m/min
Actuating force	35	N
Extraction force (not locked)	30	N
Retention force	20	N
Actuation frequency	1,200	1/h
Locking force F _{max}		
Straight actuator with bush F _s	2,500	N
Bent actuator with bush F _s	1,500	N
Locking force F _{2h} acc. to EN ISO 14119	2,000	N
Insertion depth (minimum required travel + permissible overtravel)	Actuator S standard	Actuator L for insertion funnel
Lateral approach direction (h)	24.5 + 5	28.5 + 5
Approach direction from above (v)	24.5 + 5	28.5 + 5
Guard locking solenoid		
Solenoid operating voltage (auxiliary voltage on black AS-Interface cable)	24 +10/-15% Power supply unit with electrical isolation (IEC 60742, PELV)	V DC
Solenoid operating current	300	mA
Duty cycle	100	%

AS-Interface connection



Parameter	Value	Unit
Connection	Plug connector	
Version	M12 (4-pin)	
Degree of protection acc. to IEC 60529	IP 67 ²⁾	
Switching principle	Slow-action switching contact 1 NC contact each ⇄	
EMC protection requirements	Acc. to EN 50295 (AS-Interface standard) and IEC 62026	
AS-Interface data		
Acc. to AS-Interface specification 2.1	EA code: 7	ID code: B
Total current consumption, max.		
Solenoid supply via auxiliary power	45	mA
Solenoid supply via AS-i	400	
Valid AS-Interface addresses	1 - 31	
AS-Interface inputs		
Acc. to AS-Interface Safety at Work		
Door monitoring contact SK	D0, D1	
Solenoid monitoring contact UK	D2, D3	
AS-Interface outputs		
D0	Guard locking solenoid, 1 = solenoid energized	
D1	Red LED, 1 = LED on	
D2	Green LED, 1 = LED on	
AS-Interface Power LED	Green, AS-Interface Power on	
AS-Interface Fault LED	Red, offline phase or address 0	

2) Screwed tight with the related plug connector

Safety switch STP-TW with guard locking and guard lock monitoring



Reliability values acc. to EN ISO 13849-1

Parameter	Value	Unit
B10d	4.5 x 10 ⁶ operating cycles	

Switch



Parameter	Value	Unit
Material	Housing Actuating head Cam in actuating head	Reinforced thermoplastic Die-cast aluminum Stainless steel
Mechanical life	1 x 10 ⁶ operating cycles	
Ambient temperature	- 20 ... + 55	°C
Weight	Approx. 0.6	kg
Approach speed, max.	20	m/min
Actuating force	35	N
Extraction force (not locked)	30	N
Retention force	20	N
Locking force, max.	2,500	N
Locking force F _{ZH} acc. to EN ISO 14119	2,000	N
Insertion depth (minimum required travel + permissible overtravel)	Actuator S standard	
Lateral approach direction (h)	24.5 + 5	mm
Approach direction from above (v)	24.5 + 5	mm
Guard locking solenoid		
Solenoid operating voltage (auxiliary voltage on black AS-Interface cable)	24 V +10/-15% Power supply unit with electrical isolation (IEC 60742, PELV)	V DC
Solenoid operating current	300	mA
Duty cycle	100	%

AS-Interface connection



Parameter	Value	Unit
Connection	Plug connector	
Version	M12 (4-pin)	
Degree of protection acc. to IEC 60529	IP 67 ²⁾	
Switching principle	Slow-action switching contact 1 NC contact each ⊖	
EMC protection requirements	Acc. to EN 50295 (AS-Interface standard) and IEC 62026	
AS-Interface data		
Acc. to AS-Interface specification 2.1	EA code: 7 ID code: B	
Total current consumption, max.	45	mA
Valid AS-Interface addresses	1 - 31	
AS-Interface inputs		
Acc. to AS-Interface Safety at Work		
Door monitoring contact SK	D0, D1	
Solenoid monitoring contact UK	D2, D3	
AS-Interface outputs		
D0	Guard locking solenoid, 1 = solenoid energized	
D1	Red LED, 1 = LED on	
D2	Green LED, 1 = LED on	
AS-Interface Power LED	Green, AS-Interface Power on	
AS-Interface Fault LED	Red, offline phase or address 0	

2) Screwed tight with the related plug connector

Enabling switches ZSA and ZSB



Reliability values acc. to EN ISO 13849-1

Parameter	Value	Unit
B10d	1 x 10 ⁵ operating cycles	

Hand-held version G1

Parameter	Value	Unit
Housing material	Polyamide, black	
Protective cap material	CR (neoprene), black	
Ambient temperature	- 5 ... + 50	°C
Weight	Approx. 0.4 (no cable)	kg

AS-Interface connection



Parameter	Value	Unit
Connection	Plug connector	
Version	M12 (4-pin)	
Degree of protection acc. to IEC 60529	IP 67 ²⁾ / IP 65 with buttons ²⁾	
Switching principle	Three-stage, dual-channel, 2 NO	
EMC protection requirements	Acc. to EN 50295 (AS-Interface standard) and IEC 62026	
AS-Interface data		
Acc. to AS-Interface specification 2.1	EA code: 0	ID code: B
Total current consumption, max.	45	mA
Valid AS-Interface addresses	1 - 31	
AS-Interface inputs		
Acc. to AS-Interface Safety at Work		
NO contact E1	D0, D1	
NO contact E2	D2, D3	
Plus button (only ZSB)	Parameter bit P0	
Minus button (only ZSB)	Parameter bit P1	

2) Screwed tight with the related plug connector

Non-contact safety switches CMS




Reliability values acc. to EN ISO 13849-1

Parameter	Value	Unit
Category	3	
Performance Level (PL)	e	
PFH _d	4.29 x 10 ⁻⁸	
Mission time	20	years

Evaluation unit

Parameter	Value	Unit
Read head		
Housing material	Fiberglass reinforced PPS	
Ambient temperature	-20 ... +60	°C
Degree of prot. acc. to EN 60529	IP 67	
Installation position	Any, alignment with actuator should be kept in mind (markings)	
Connection	Connection cable with M12 plug connector	
Cable length	1	m
Cable material	PVC	
Method of operation	Magnetic, reed contact	
Mech. life	100 x 10 ⁶ operating cycles	
Vibration resistance	10 ... 55 Hz, amplitude 1 mm	
Shock resistance	30 g/ 11 ms	
Actuator		
Housing material	Fiberglass reinforced PPS	
Ambient temperature	-20 ... +60	°C
Degree of prot. acc. to EN 60529	IP 67	
Installation position	Any, alignment with read head should be kept in mind (markings)	
Method of operation	Magnetic	
Vibration resistance	10 ... 55 Hz, amplitude 1 mm	
Shock resistance	30 g/ 11 ms	
Distances with read head		
	CMS...AZA...	CMS...BZB...
Switch-on distance S _{ao}	9	7
Assured switch-off distance S _{ar}	70	40
Center offset m between actuator and read head	± 2.5 at a distance of s = 3	
Times		
Max. time-delay from state change	5	ms

AS-Interface connection

Parameter			Value	Unit
AS-Interface data				
Acc. to AS-Interface specification 3.2	CMS-R-AZA...	EA code: 7	ID code: B	
	CMS-R-BZB...	EA code: 0	ID code: B	
Operating voltage, AS-Interface	26.5 ... 31.5			V DC
Total current consumption, max.	30			mA
Valid AS-Interface addresses	1 - 31			
AS-Interface inputs				
Acc. to AS-Interface Safety at Work				
Switch actuated	D0 ... D3, code sequence			
Switch open	D0 ... D3, zero sequence			
AS-Interface outputs (only CMS-R-AZA)				
Output D1	LED, 1 = LED on			

Key adapter CKS...AS



Reliability values acc. to EN ISO 13849-1

Parameter	Value	Unit
Category	4	
Performance Level (PL)	e	
PFHd	4.5 x 10 ⁻⁹	
Mission time	20	years

Key adapter

Parameter	Value	Unit
Housing material	PA6-GF30 black	
Fixing screw tightening torque	0.25 ... 0.35	Nm
Dimensions	75 x 40 x 73	mm
Weight	0.13	kg
Ambient temperature	-10 ... +65	°C
Degree of protection acc. to IEC 60529	IP 67 in mounted condition (only access side)	
Safety class	III	
Degree of contamination	2	
Installation position	On the front panel	
Mounting cut-out according to DIN 43700	33 x 68	mm
Connection	Screw terminal, 2-pin	
Resilience to vibration	In acc. with EN IEC 60947-5-2	
Ready delay	0.5	s
Risk time	Max. 260	ms
Switch-on time	Max. 300	ms

AS-Interface connection



Parameter	Value	Unit
LED indicator	Green: Key inserted Yellow: Operational Red: Fault	
AS-Interface data	EA code: 7	ID code: B
AS-i operating voltage	19 ... 31.6	V DC
Total current consumption, max.	50	mA
Valid AS-Interface addresses	1 - 31	
AS-Interface inputs	Acc. to AS-Interface Safety at Work	
Influenced by key	D0 - D3	

Key

Parameter	Value	Unit
Housing material	PVC plastic	
Dimensions	42 x 25 x 18	mm
Weight	4	g
Ambient temperature	-20 ... +70	°C
Degree of protection acc. to IEC 60529	IP 67	
Power supply	Inductive via key adapter	

Safety switch CES-AS-C04



Reliability values acc. to EN ISO 13849-1

Parameter	Value	Unit
Category	4	
Performance Level (PL)	e	
PFH _d	4.5 x 10 ⁹	
Mission time	20	years

Switch



Parameter	Value	Unit
Housing material	PBT plastic	
Rubber-support material	NBR	
Fixing screw tightening torque	Max. 0.8	Nm
Dimensions	42 x 25 x 18	mm
Weight	4	g
Ambient temperature at U _a = DC 30 V	-10 ... +65	°C
Storage temperature	-20 ... +70	°C
Degree of protection	IP 67	
Safety class	III	
Degree of contamination	3	
Installation position	Any	
Installation method	Non-flush	mm
Connection	M8 plug connector, 3-pin	
For the approval according to UL the following applies	Operation with UL-class 2 power supply only	
Resilience to vibration	In acc. with EN IEC 60947-5-2	
Switching frequency	1	Hz
Ready delay	0.5	s
Risk time according to EN 60947-5-3	Max. 260	ms
Switch-on time of safety outputs	Max. 300	ms

AS-Interface connection

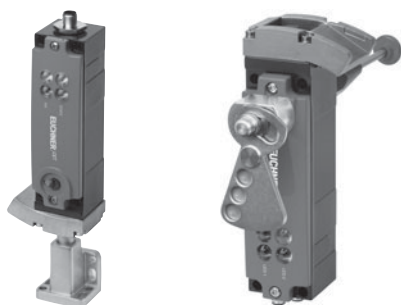


Parameter	Value	Unit
AS-Interface data	EA code: 0 ID code: B	
AS-i operating voltage	19 ... 31.6	V DC
Total current consumption	Max. 50	mA
Valid AS-Interface addresses	1 - 31	
AS-Interface inputs	Acc. to AS-Interface Safety at Work	
Door monitoring contact	D0 - D3	

Actuator

Parameter	Value	Unit
Housing material	PBT plastic	
Dimensions	42 x 25 x 18	mm
Weight	3	g
Ambient temperature	-40 ... +65	°C
Degree of protection acc. to IEC 60529	IP 67/ IP 69K	
Installation position	Active face opposite read head	
Power supply	Inductive via read head	

Safety switch CET-AS1 with guard locking and integrated evaluation electronics



Reliability values acc. to EN ISO 13849-1		Value		Unit
Parameter	Head downward or horizontal	Head upward		
Category	4	3		
Performance Level (PL)	e	e		
PFFh _d	3.1×10^{-9}	4.29×10^{-8}		
Mission time	20	20		years

Switch/evaluation electronics		Value		Unit
Parameter				
Material	Ramp	Stainless steel		
	Switch housing	Die-cast aluminum		
Installation position		Any (recommendation: switch head downward)		
Mechanical life		1×10^6		
Ambient temperature		- 20 ... + 55		°C
Weight		Approx. 1		kg
Actuator approach speed, max.		20		m/min
Locking force, max.		6,500		N
Locking force F_{zh} acc. to EN ISO 14119		5,000		N
Degrees of freedom X, Y, Z		X, Y ± 5 ; Z ± 4		mm
Guard locking solenoid				
Solenoid operating voltage (auxiliary voltage on black AS-Interface cable)		24 V +10/-15% Power supply unit with electrical isolation (IEC 60742, PELV)		V DC
Current consumption		50		mA
Solenoid current consumption I_{CM}		400		

AS-Interface connection		Value		Unit
Parameter				
Connection		Plug connector		
Version		M12 (4-pin)		
Degree of protection acc. to IEC 60529		IP 67 ²⁾		
Switching principle		Slow-action switching contact 1 NC contact each \ominus		
EMC protection requirements		Acc. to EN 50295 (AS-Interface standard) and IEC 62026		
AS-Interface data				
Acc. to AS-Interface specification 2.1		EA code: 7	ID code: B	
Total current consumption		Max. 30		mA
Valid AS-Interface addresses		1 - 31		
AS-Interface inputs				
Acc. to AS-Interface Safety at Work				
Door monitoring contact SK		D0, D1		
Solenoid monitoring contact UK		D2, D3		
AS-Interface outputs				
D0		Guard locking solenoid, 1 = solenoid energized		
D1		Red LED, 1 = LED on		
D2		Green LED, 1 = LED on		

2) Screwed tight with the related plug connector

Safety switch CTP-L.-AS1 with guard locking and integrated evaluation electronics



Reliability values acc. to EN ISO 13849-1

Parameter	Value	Unit
Category	4	
Performance Level (PL)	e	
PFH _d	4.3 x 10 ⁻⁹	
Mission time	20	years

Switch/evaluation electronics



Parameter	Value	Unit
Material	Die-cast zinc	
Switch head	Reinforced thermoplastic	
Switch housing		
Installation position	Any	
Degree of protection acc. to IEC 60529	IP 67 / IP 69 ²⁾	
Safety class according to EN IEC 61558	III	
Mechanical life	1 x 10 ⁶	
Ambient temperature at UB = 24 V	- 20 ... + 55	°C
Actuator approach speed, max.	20	m/min
Actuating/extraction/retention force at 20 °C	10/20/20	N
Overtravel	5	mm
Locking force F _{max} ¹⁾	2,600	N
Locking force F _{zh} acc. to EN ISO 14119	F _{zh} = F _{max} / 1.3 = 2,000	N
Weight	Approx. 0.42	kg
Connection	Plug connector M12, 4-pin	
For the approval according to UL the following applies	Operation only with UL class 2 power supply, or equivalent measures	
Ready delay	Max. 1	s
Switching frequency	Max. 0.5	Hz
Risk time	Max. 260	ms
Switch-on time	Max. 400	ms
Solenoid		
Solenoid operating voltage (auxiliary voltage on black AS-Interface cable)	24 V +10/-15% Power supply unit with electrical isolation (IEC 60742, PELV)	V DC
Current consumption with auxiliary voltage	400	mA
Duty cycle	100	%

AS-Interface connection



Parameter	Value	Unit
Switching principle	Slow-action switching contact 1 NC contact each ⊕	
EMC protection requirements	Acc. to EN 50295 (AS-Interface standard) and IEC 62026	
AS-Interface data		
Acc. to AS-Interface specification 2.1	EA code: 7 ID code: B	
AS-i operating voltage	26.5 ... 31.6	V DC
Total current consumption	Max. 50	mA
Valid AS-Interface addresses	1 - 31	
AS-Interface inputs	Acc. to AS-Interface Safety at Work	
Influenced by door position	DO, D1	
Influenced by guard locking	D2, D3	
AS-Interface outputs		
Guard locking solenoid	DO, 1 = Solenoid energized	

1) Applies only in combination with straight actuators.

2) Screwed tight with the related plug connector

Safety Basis Monitor SBM



Reliability values acc. to EN ISO 13849-1

Parameter	Value	Unit
Category	4	
Performance Level (PL)	e	
PFH _d	5.08 x 10 ⁻⁹	
Mission time	20	years

SBM



Parameter	Value			Unit
	min.	typ.	max.	
Housing	Connecting strip housing			
Ambient temperature	0	-	+55	°C
Storage temperature	-25	-	+85	
Dimensions (H x W x D)	99 x 22.5 x 114			mm
Degree of protection acc. to IEC 60529	IP 20			
Connection	COMBICON plug			
AS-i voltage	18	-	31.6	V
Safety monitor	Safety Basis Monitor			
OSSD (Output Signal Switching Device)	2-channel			
Response time	< 40			ms
Inputs	4 safe inputs of Cat. 4 or 8 standard inputs and outputs			
Switching current at 24 V	static	4		mA
	dynamic (T = 100 µs)	30		
Connection conditions between the input terminals				
- Resistance	-	-	150	Ω
- Cable length	-	-	200	m
Outputs: 2 output switching elements	Semiconductor outputs (output circuits 1 and 2)			
Contact capacity DC13 at 24 V	-	-	700	mA
AS-i current consumption	-	-	200	
AUX voltage (PELV)	20	-	30	V
AUX current consumption	-	-	4	A
AS-i/AUX insulation voltage	-	500	-	V
Input supply voltage	From 24V auxiliary power			
Output supply voltage	From 24V auxiliary power			
Output current for monitoring outputs (per output)	-	-	10	mA
Output current for OSSD supply	-	1.4	-	A
Test pulse when output is switched on				
- Interval between 2 test pulses	250	-	-	ms
Pulse length up to	-	1	-	ms
Display elements and switches				
4 x yellow LED (S1, S2, S3, S4)	State of inputs S1, S2, S3, S4			
4 x yellow LED (S5, S6, S7, S8)	State of inputs S5, S6, S7, S8			
Green/yellow/red LED (SM)	State of safety monitor			
Green/yellow/red LED (AS-i M)	State of AS-i master			
Green/yellow/red LED (O1)	Output 1 has switched			
Green/yellow/red LED (O2)	Output 2 has switched			
Button	1 x service			
Applicable standards	EN 954-1 Cat. 4, IEC 61508 SIL 3, EN IEC 62061 SIL 3 EN 13849-1 2006/PL e			

Safety monitors SFM



Reliability values acc. to EN ISO 13849-1

Parameter	Value	Unit
Category	4	
Performance Level (PL)	e	
PFH _d	9.1 x 10 ⁹	
Mission time	20	years

SFM-A01, SFM-A02, SFM-B02, SFM-C12



Parameter	Value	Unit
Housing material	PA6.6 plastic	
Dimensions	45 x 105 x 120	mm
Weight	Approx. 0.35	kg
Operating temperature	- 20 ... + 60	°C
Storage temperature	- 30 ... + 70	°C
Mounting	35 mm DIN rail acc. to DIN EN 50022-35	
Operating voltage U _b	24+15%/-15% Power supply unit with electrical isolation (IEC 60742, PELV)	V DC
Residual ripple	< 15%	
Rated operating current	SFM...1: 150 SFM...2: 200	mA
Response time	< 40	ms
Switch-on delay	< 10	s
Connection		
Connection	Plug-in screw terminals	
Connection terminals	0.14 ... 2.5	mm ²
Degree of protection acc. to EN 60529	IP 20	
EMC protection requirements	Acc. to EN 50295 (AS-Interface standard)	
Inputs		
Start	Optocoupler input, active high PNP transistor output, 200 mA, short-circuit and reverse polarity protection	
Feedback loop	Optocoupler input, active high Input current approx. 10 mA at 24 V DC	
Outputs		
Monitoring outputs	4 door monitoring outputs PNP transistor output, 200 mA, short-circuit and reverse polarity protection	
OSSDs (Output Signal Switching Devices)	2 relay outputs	
Max. contact load	1 A DC-13 at 24 V DC / 3 A AC-15 at 230 V AC	
Continuous thermal current	3 A per output circuit	
External fuse, max.	4 A medium slow-blow	
Overvoltage category	3 for rated operating voltage, 300 V AC according to VDE 0110 Part 1	
AS-Interface data		
Acc. to AS-Interface specification 3.2	EA code: 7 ID code: B	
Operating voltage, AS-Interface	18.5 ... 31.6	V
Total current consumption, max.	45	mA

Terminal assignment

SFM-A02 SFM-B02

1.13	1.23	1.Y1	2.13	2.Y1
⊗	⊗	⊗	⊗	⊗
⊗	⊗	⊗	⊗	⊗
+	-	1.Y2		2.Y2
AS+				
L+	M	1.32		2.32
⊗	⊗	⊗	⊗	⊗
1.14	1.24	FE	2.14	2.24
⊗	⊗	⊗	⊗	⊗

- AS-Interface + ▶ Connection to AS-Interface bus
- AS-Interface - ▶ Connection to AS-Interface bus
- L + ▶ 24 V DC
- M ▶ GND / reference ground
- FE ▶ Function earth
- 1.Y1 ▶ EDM / feedback loop 1
- 1.Y2 ▶ Start input 1
- 1.13 ▶ Safety output 1.13
- 1.14 ▶ Safety output 1.14
- 1.23 ▶ Safety output 1.23
- 1.24 ▶ Safety output 1.24
- 1.32 ▶ Monitoring output 1
- 2.Y1 ▶ EDM / feedback loop 2
- 2.Y2 ▶ Start input 2
- 2.13 ▶ Safety output 2.13
- 2.14 ▶ Safety output 2.14
- 2.23 ▶ Safety output 2.23
- 2.24 ▶ Safety output 2.24
- 2.32 ▶ Monitoring output 2

AS-Interface Safety at Work safe output SOM



Reliability values acc. to EN ISO 13849-1

Parameter	Value	Unit
Category	4	
Performance Level (PL)	e	
PFHd	3.2×10^{-8}	
Mission time	20	years

SOM



Parameter	Value	Unit
Housing material	PA6.6 plastic	
Dimensions	22.5 x 105 x 114	mm
Weight	Approx. 0.2	kg
Operating temperature	0 ... + 55	°C
Storage temperature	- 25 ... + 85	°C
Mounting	35 mm DIN rail acc. to DIN EN 50022-35	
Supply current for sensors	100	mA
Insulation voltage	≥ 6	kV
Connection		
Connection	Plug-in screw terminals	
Connection terminals	0.14 ... 2.5	mm ²
Degree of protection acc. to EN 60529	IP 20	
EMC protection requirements	Acc. to EN 50295 (AS-Interface standard)	
Inputs	2 conventional + 2 EDM	
Outputs	Relay (2 redundant)	
AS-Interface data		
Acc. to AS-Interface specification 3.2	EA code: 7	ID code: F
Operating voltage, AS-Interface	18.5 ... 31.6	V
Total current consumption, max.	45	mA

Safety monitors GMOx



Reliability values acc. to EN ISO 13849-1

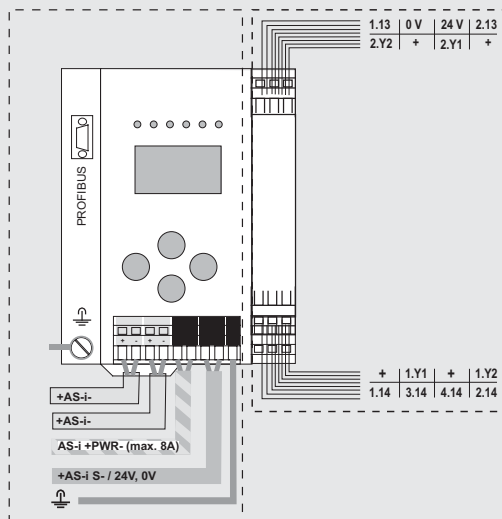
Parameter	Value	Unit
Category	4	
Performance Level (PL)	e	
PFH _d	5.36 x 10 ⁹	
Mission time	20	years

GMOx



Parameter	Value	Unit
Housing material	Stainless steel	
Dimensions	120 x 96 x 100	mm
Weight	0.8	kg
Ambient temperature	0 ... + 55	°C
Permissible shock and vibration load	Acc. to EN 61131-2	
Operating voltage (AS-i voltage)	30	V DC
Operating current (from AS-i circuit)	300	mA
Insulation voltage	≥ 500	V
Standards	EN 61000-6-2, EN 61000-6-4, EN 62 061 (SIL 3), EN ISO 13849-1 (PL e)	
Connection		
Connection	Plug-in connection terminals	
Degree of prot. acc. to EN 60529	IP 20	
Display elements and switches		
LC display	AS-i slave, error messages	
LEDs	8 (4 inputs, 4 outputs, AUX) 7 (power, PROFIBUS, config error, U AS-i, AS-i active, pgr enable, prj mode)	
Button	4	
Profibus interface		
Transfer rates	Acc. to EN 50170-3 9.6 ... 12,000	
DP functions	Mapping of the AS-i slaves as I/O process data in the Profibus; complete diagnostics and configuration via PROFIBUS DP master	
Safety monitor interface		
Switch-on delay	< 10	s
Response delay	< 40	ms
Inputs	2 x EDM, 2 x start	
OSSDs (Output Signal Switching Devices)	2 relay contacts, 2 semiconductor	
Card slot	Memory card to store the configuration data	
Serial interface	RS232	

Terminal assignment



Bus coupling module BCM



BCM-A-P2-SEM4-1

Parameter	Value	Unit
Housing material	Reinforced thermoplastic	
Degree of protection according to IEC 529 (mating connector inserted)	IP 67 on single insertion of the cable	
Ambient temperature	-20...+ 70	°C
Installation position	Any	
Weight	Approx. 30	g
Voltage, max.	36	V DC
Current, max.	4	A
AS-Interface to power insulation voltage	200	V
Mounting	Screw mounting (1 x M6)	
Connection		
AS-Interface and auxiliary power	Ribbon cable AS-i	
Line 1	AS-Interface bus ribbon cable (AS-Interface +, AS-Interface -)	
Line 2	Power ribbon cable (+24 V, 0 V)	
Safety switch	M12 socket	

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