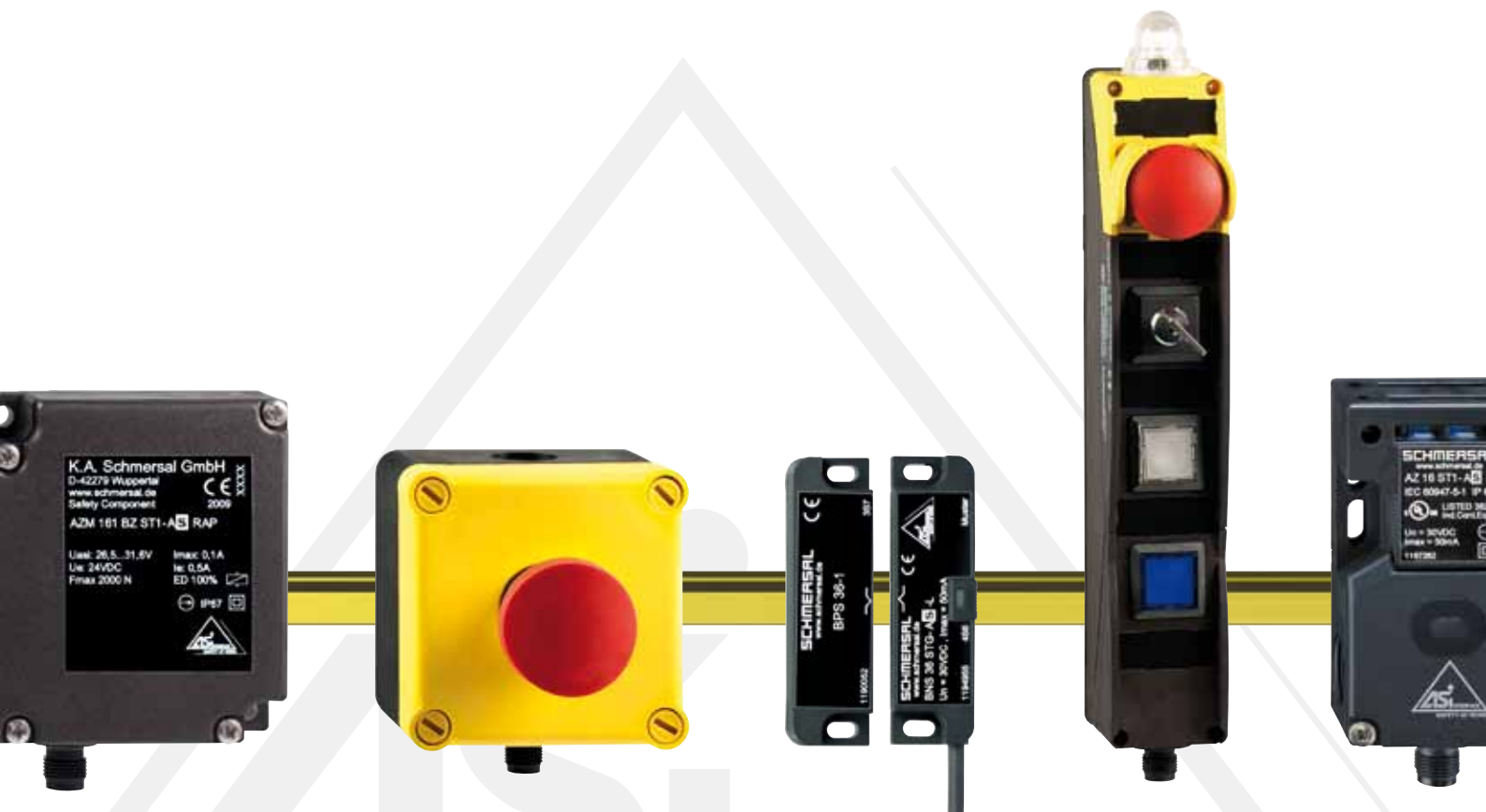


Safety Bus System

AS-Interface Safety at Work | Version 09



AS-INTERFACE
SAFETY AT WORK



SCHMERSAL

Safe solutions for your industry

You will also find detailed information regarding our product variety on our website:

www.schmersal.net



Online documentation in 13 languages

The online catalogue for our customers is permanently updated. The Main catalogue can be consulted on the Internet in as much as 13 languages.

The technical data of our entire product range are available 24/7, always upto-date. The declarations of conformity, the test certificates and the mounting instructions can be consulted or even downloaded as well.

Service for designers

The online catalogue also includes the technical drawings of our products – a special service to designers. In this way, they can be downloaded and directly fed in CAD-systems.

The Schmersal homepage furthermore contains up-to-date information on general subjects, technical articles on machine safety as well as news regarding events and trainings. To be bookmarked!

The direct way

If you need further information or you want personal advice, you can call us as well: **Tel. +49-(0) 2 02-64 74-0.**

The addresses of our representations in Germany and abroad can be found on the front pages of this catalogue.

We are at your disposal – anyplace, anywhere, anytime!



Warning!

The Schmersal programme is not intended for private consumers, i.e. that they are not consumer products within the meaning of the European Directives (in Germany within the meaning of § 5 GPSG) or other national laws.

Subject to technical modifications and errors.

The data specified in this catalogue are carefully checked typical standard values.

Descriptions of technical correlations, details on external control units, installation and operating instructions or similar have been provided to the best of our knowledge. This however does not mean that any warranted characteristics or other

properties under liability law may be assumed, which extend beyond the "General Terms and Conditions of Delivery of Products and Services of the Electrical Industry".

We trust you will understand that the user must check our information and recommendations before using our equipment.

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Easy, safe and reliable

AS-Interface Safety at Work[®]

AS-Interface Safety at Work (SaW) is the first safety bus system based upon the open standard of AS-International. Safety components such as Emergency Stop command devices, safety switches, solenoid interlocks or safety light curtains are simply connected to the yellow AS-Interface cable. For the evaluation of the safety signals a „Safety Monitor“ is merely added to the AS-Interface system.

AS-Interface Standard in accordance with EN 50295

With the integration of AS-Interface SaW the AS-Interface network will continue to operate unchanged. The well known components, like the standard AS-Interface master, the standard power supply as well as the AS-Interface yellow cable will still form the basis of all AS-Interface installations. Therefore an existing machine can easily be equipped with additional AS-i SaW components.

The heart of safety

The safety monitor analyses all transmitted information from each safety device on the AS-Interface network and, in case of a safety device being activated or in case of a fault in one of the safety devices, the safety monitor immediately shuts down to create a safe condition. The safety monitor is equipped with one or two redundant pairs of enabling paths for applications up to performance level e according to EN ISO 13849-1. Each safety function of the monitor can be set with a simple drag & drop software. Afterwards the configuration is downloaded into the safety monitor and protected with a password.

Safe transmission mechanism

The communication protocol for safety relevant applications is based on the unchanged AS-Interface Standard transmission. With each AS-Interface master call each safety device answers in return with a preset data telegram. This information is analysed and in case of a deviation from the pre-set values the enabling paths are opened. The maximum response time for a safe shutdown is 40 ms.

Cost reduction with AS-Interface Safety at Work

Reduce cost and installation time – A never ending story. During installation and machine commissioning as well as during maintenance, AS-Interface SaW supports the user with integrated system diagnosis. It provides detailed information about the cause and place of the failure, and enables the user to quickly find and analyse a malfunction and therefore minimise machine downtime. With AS-Interface Safety at Work you can directly reduce your cost.

More flexibility with AS-Interface Safety at Work

For the realisation of individual safety solutions, SCHMERSAL offers the maximum amount of flexibility with its diverse range of safety devices. Depending on the application the user can choose the optimal solution out of an extensive product basket. As AS-Interface SaW is an open system, the user has also the possibility to include additional Safety components from other suppliers. AS-Interface Safety at Work fulfils the safety requirements to the highest standards.

Less installation time with AS-Interface Safety at Work

Easier and quicker with AS-Interface SaW: Choose a Safety device – Connect it to the yellow AS-Interface cable – Configure the safety function in the safety monitor. – That's it.

No further settings are required at each of the safety devices, the bulky parallel wire cables between the safety devices in the field and the switching cabinet are reduced and wiring time is decreased. The power supply for all safety sensors is supplied over the single yellow AS-Interface cable.



Safety monitors



Safety switches



Solenoid interlocks



Non-contact solenoid interlock



Position switches with safety function

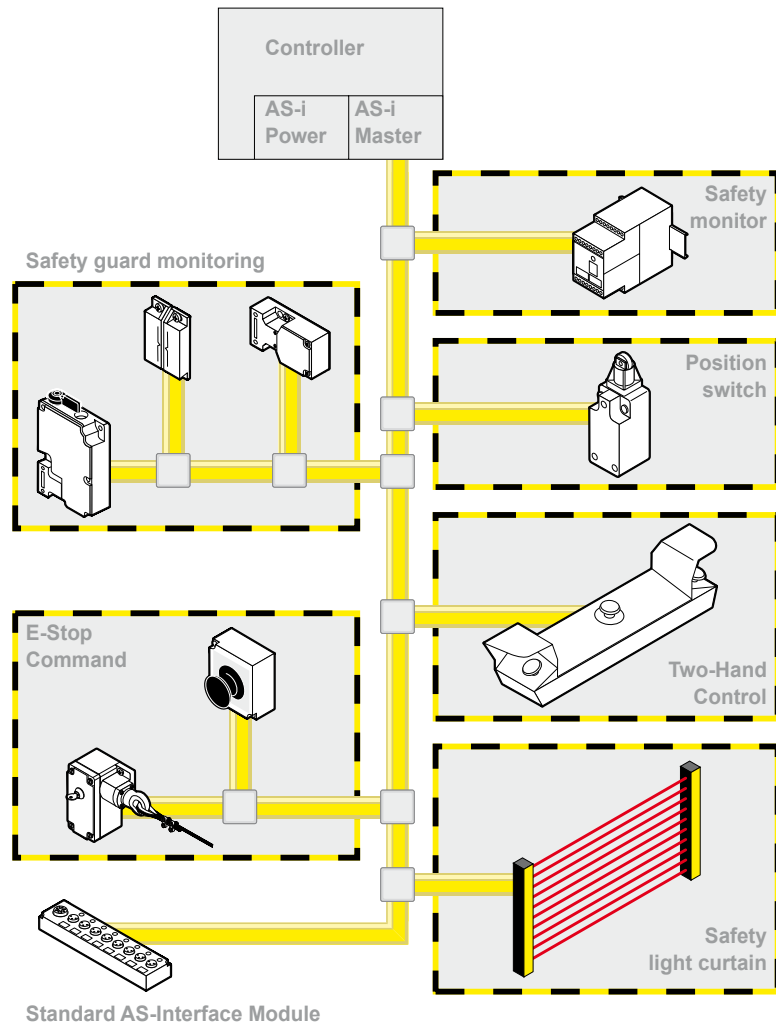


Pull-wire emergency stop switches

AS-Interface SaW - System Features

- Up to 31 standard and safety slaves on the AS-Interface system
- No Safety PLC necessary
- Safety-relevant signals can be allocated into groups and multiple Safety monitors may be connected
- Response time is max. 40 ms
- Safety-relevant signals can be integrated into plant diagnostics
- Certified up to
 - PL e/category 4 in accordance with EN ISO 13849-1
 - SIL 3 in accordance with IEC 61508
- Certified by the TÜV (German Technical Inspectorate)

AS-Interface Safety at Work overview



Safety foot switch



Safety sensors



Magnetic solenoid interlock



Control panels



E-Stop Command

ASM



- **Safety monitor for 1 AS-i circuit**
- Monitoring of up to 31 safe AS-i slaves, e.g.: safety switches, solenoid interlocks, emergency stop devices, two-hand controls, light curtains and light grids, etc.
- Control of up to 2 redundant enabling paths
- Configurable monitoring modules for the different safety switchgear
- Filter functions for bouncing safety guards
- Other functions:
 - AND operations, OR operations, start modules, on-site reset, start-up test, stop categories 0 and 1
- Edge-sensitive start push button
- Feedback circuit to monitor external contactors
- LED status display
- Signal outputs (transistor, short-circuit proof)
- AS-i system connection

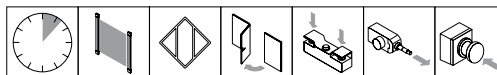
- These device types are **not suitable** for the:
 - control of safe AS-i outputs
 - connection of 2 AS-i circuits

- Suitable for applications:
 - up to PL e / category 4 to EN ISO 13849-1
 - up to SIL 3 to IEC/EN 61508
 - PFH value: $9.1 \times 10^{-9}/h$

Technical data

Standards:	EN 50295, EN ISO 13849-1, IEC 61508, EN 60947-5-1, IEC/EN 60204-1, EN 61496-1
Enclosure:	Polyamide PA 66, black
Mounting:	Snaps onto standard DIN rail to EN 50022
Screw terminals:	max. 2.5 mm ² (incl. conductor ferrules)
Protection class:	Terminals IP20; enclosure IP20
U _b :	24 VDC ± 15 %
Residual ripple:	< 15%
I _b :	ASM E1-R2: 0.15 A; ASM E2-R2/R2: 0.2 A
Switch-on peak current:	600 mA
AS-Interface operating voltage:	18.5 ... 31.6 V
AS-Interface operating current:	< 45 mA
AS-Interface specification:	Profile - Monitor 7.F
Configuration interface:	RS 232 : 9600 baud, no parity, 1 start bit, 1 stop bit, 8 data bits
Inputs:	1.Y1, 1.Y2
Input signal:	„Y1, Y2“: I _e < 10 mA, 24 VDC (opto coupler, high-active)
Outputs:	ASM E1/R2: 1.13/14, 1.23/24, 1 enabling path (redundant); ASM E2-R2/R2: 1.13/14, 1.23/24, 2.13/14, 2.23/24, 2 enabling paths (redundant)
Utilisation category:	AC-15, DC-13
I _e /U _e :	3 A / 230 VAC; 1 A / 24 VDC
Switching voltage:	max. 230 VAC
I _{the} :	ASM E1-R2: 3 A per output circuit ASM E2-R2/R2: 2 A per output circuit
Max. fuse rating:	max. 4 A (slow blow), external
Additional outputs:	transistor outputs, 200 mA total, short-circuit proof-type, positive-switching
Switch-on time:	< 10 s
Response time:	< 40 ms
Indications:	AS-Interface: voltage LED green, communication LED red; Enabling paths: LED green/yellow/red
EMC:	to EN 61000-6-4, EN 61000-6-2
EMC rating:	to EMC Directive
Overvoltage category:	III to DIN VDE 0110
Resistance to vibration:	0 ... 55 Hz, amplitude 0.35 mm
Resistance to shock:	10 g / 16 ms
Ambient temperature:	-20 °C ... +60 °C
Storage and transport temperature:	-30 °C ... +70 °C
Weight:	ASM E1-R2: approx. 350 g; ASM E2-R2/R2: approx. 450 g
Dimensions:	45 x 105 x 120 mm
Classification:	
Standards:	EN ISO 13849-1; IEC 61508
PL:	up to e
Category:	up to 4
PFH value:	$9.1 \times 10^{-9} /h$
SIL:	up to 3
Mission time:	20 years

Approvals



Ordering details

ASM ①

No.	Option	Description
①	E1-R2	1 enabling path (redundant)
	E2-R2/R2	2 enabling paths (redundant)

Note

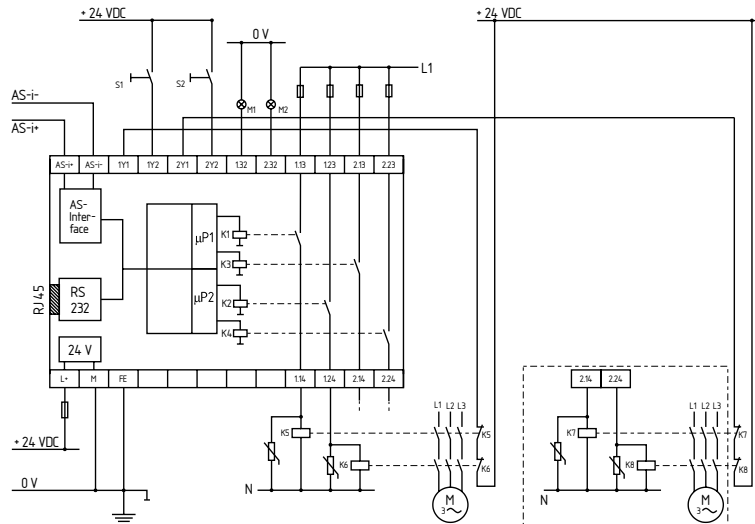
The safety monitors ASM E1-R2 and ASM E2-R2/R2 evaluate all transmitted information from each safety device on the AS-Interface network. For the safe guarding of different applications various AS-Interface Safety at Work compatible safety devices are needed, i.e. safety switches, solenoid interlocks, safety sensors, E-stop buttons as well as safe input modules.

AS-Interface Safety at Work

Note

- The installation of different safety areas is possible with numerous safety monitors working alongside each other. The maximum number of safety devices including the safety monitors may not exceed 31 participants.
 - The allocation of the safety devices to one or more safety monitors is achieved with the help of the configuration software "asimon".
 - The wiring diagram shows the safety monitor ASM E2-R2/R2 with start-pushbuttons and feedback loops.
 - No safety devices are displayed, because they are installed in the field i.e. on the safety guards itself. The data connection between the safety monitor and the decentralised safety slaves is established via the ASInterface network.
 - For the operation of AS-Interface Safety at Work system, a standard controller, an AS-Interface Master and AS-Interface power supply, must be used in the application.
 - With the RJ 45 connector the safety monitor is configured and started up.
- **Start push button**
A start push button (NO) can optionally be connected to the ASM. With the guard door(s) closed, the enabling paths are then not closed until the start push button has been operated. If neither start button nor feedback circuit are required, then no connections are required to the terminals (1Y1/2, 2Y1/2).
 - **Output expander module**
For additional contacts by means of more enabling paths and potential-free indication contacts an output expander module is connected to the safety monitor, i.e. to the internal ASM enabling path. For the control of the additional outputs the ASM feedback loop is utilised.

Wiring diagram



Note

Further information and details of the safety monitor ASM are available on the asimon-CD-ROM.

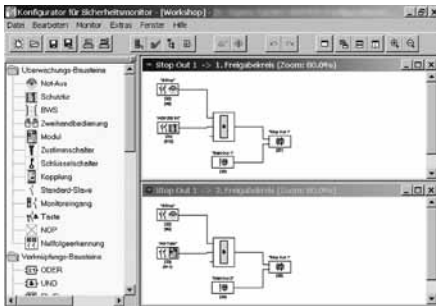
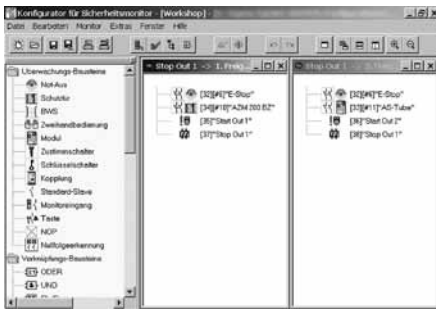
Note

The AS-i system limitations according to EN 50295 have to be considered during the planning, development and design phase of the AS-i network, especially the max. number of AS-i slaves and the total „yellow“ cable length (< 100 m without repeater).

For the control of safety outputs and for coupling multiple AS-i networks, other safety monitoring modules like ASM G2 must be used.

Inductive loads (e.g. contactors, relays, etc.) are to be suppressed by means of a suitable circuit.

asimon version 3.x



The asimon software is a tool for the configuration and commissioning of the AS-Interface safety monitor.

The configuration of the safety monitor and its safety devices, i.e. E-Stop buttons, solenoid interlocks, safety switches, 2-Hand controls, light curtains etc. is performed by an easy-to-use graphical interface. Thus providing safeguarding of hazardous areas present by power-driven machinery.

The asimon offers the user a library of icons representing different safety devices and other functional devices. For the implementation of a new safety application the required safety devices are selected from the icon library, configured and assigned to the respective enabling path.

Following the successful configuration and download, the safety monitor and the safety devices can be tested and monitored with asimon.

Besides the classic representation in table form, a representation as logical diagram (FUP) can be chosen as well.

The following functions are available with the asimon software:

- Configuration of different safety devices
- Configuration of different filter functions for bouncing safety guards
- Configuration of start-modules
- Configuration logical combinations (AND, OR, RS Flip-Flops)
- Configuration of the feedback loops
- Configuration of the operating methods
- Configuration of the system-modules
- Print out of Configuration protocol

Asimon can be used offline as well as online during development and project planning. The configuration files can be saved and loaded as desired.

The software is compatible with the Microsoft® operating system Windows 95/98/ME/NT/2000/XP/Vista/7®.

System components



Download cable ASM-DC1



Configuration cable ASM-KC1

Approvals



Ordering details

ASM-startup-package: **SET ASM-SWP**
Configuration and diagnostic software package with online documentation on CD-ROM, a configuration- and downloadcable

asimon software package: **ASM-CD**
Configuration and diagnostic software package with online documentation on CD-ROM

Note

Hardware requirements:

- A Pentium®. Intel® processor of faster (or compatible models, e.g. AMD® or Cyrix®)
- At least 32 Mb free random-access memory (RAM)
- At least 32 Mb free disk space
- A CD-ROM player
- A free RS 232 (serial) interface with 9-pole SubD connector
(Using a USB-RS 232 interface convertor or a serial interface card could cause communication problems with the safety monitoring module)

Software requirements:

- Operating system: Microsoft® Windows 95/98/ME/NT/2000/XP/Vista/7®

Ordering details

Download cable: **ASM-DC1**
Interface cable with two RJ 45 connectors, Length: 0.10 m

Configuration cable: **ASM-KC1**
Interface cable with one RJ 45 and SUBD 9 connector, Length: 1.2 m

ASM G2



- **Safety monitor for 2 AS-i circuits**
- Monitoring of up to 62 safe AS-i slaves, e.g.: safety switches, solenoid interlocks, emergency stop devices, two-hand controls, light curtains and light grids, etc.
- 256 function blocks (devices) possible
- Control of up to 16 redundant enabling paths, 2 internally in the device and up to 14 external safe AS-i outputs
- Mains coupling of 2 AS-i circuits
- LCD diagnostic display with 4 buttons
- Configurable monitoring modules for different safety switchgear
- Filter functions for bouncing safety guards
- Integrated muting module
- Other functions:
 - AND-operations, OR-operations, start modules, on-site reset, start-up test, stop categories 0 & 1
- START inputs: start functions through external button
- EDM inputs: connection of feedback circuits to monitor external contactors
- LED status indication
- AS-i system connection
- **Suitable for applications:**
 - up to PL e / category 4 to EN ISO 13849-1
 - up to SIL 3 to IEC/EN 61508
 - PFH value: $5.4 \times 10^{-9}/h$

Approvals



Ordering details

Safety monitor for 2 AS-i circuits and for up to 16 enabling paths

ASM G2-R2/R2

* Note: UL/CSA: Class 2 power-supply only

For the configuration with the asimon software, a PC or laptop is required.

Technical data

Standards: EN 50295, EN ISO 13849-1, IEC 61508
 Response time: < 40 ms
 Switch-on time: < 10 s
 AS-i specification: Profile: S-7.5.5
 Enclosure: Stainless steel
 Dimensions (L/W/H): 120 x 85 x 96 mm
 Weight: approx. 800 g
 Mounting: onto standard DIN rails
 Screw terminals: max. 2 x 1.5 mm²

Electrical data:

AS-i operating voltage: 26.5 ... 31.6 VDC
 AS-i operating current: approx. 250 mA or external supply
 Operating voltage: 24 VDC ± 15 %
 Power consumption 24 VDC: approx. 200 mA
 Power consumption from AS-i: approx. 50 mA
 Insulation voltage: 500 V
 Inputs: 4 inputs, supplied from AS-i, as EDM or start inputs
 Outputs: each time 2 output switching elements, for enabling paths 1 and 2
 Contact load capacity: 3 A DC-13 at 30 V
 3 A AC-15 at 30 V

Diagnostic indications:

- LCD AS-i status and error indications
 - LED green Power
 - LED green/red U AS-i / Fault
 - LED yellow Ready
 - LED green Channel 1
 - LED green Channel 2

Ambient conditions:

Operating temperature: 0 °C ... +55 °C
 Storage and transport temperature: -25 °C ... +85 °C
 Protection class: IP20 to IEC/EN 60529
 Resistance to vibration: to EN 61131-2
 Resistance to shock: to EN 61131-2

Classification:

Standards: EN ISO 13849-1; IEC 61508
 PL: up to e
 Category: up to 4
 PFH value: $5.4 \times 10^{-9}/h$
 SIL: up to 3
 Mission time: 20 years

Note

Hardware requirements:

- A Pentium® Intel® processor or faster (e.g. compatible models, e.g. AMD® or Cyrix®)
- A CD-ROM player
- At least 32 MB RAM and 32 MB HDD
- A free RS 232 (serial) interface with 9-pole SubD-connector
 (Using a USB-RS 232 interface convertor or a serial interface card could cause communication problems with the safety monitor)

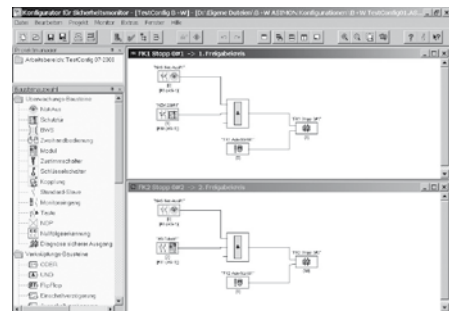
Operating system:

- Microsoft® Windows 2000/XP/Vista/7®

System components



Configuration cable ASM G2-CC



Configuration software asimon G2 V 3.x

Software asimon G2 for the configuration, commissioning and diagnostics of the AS-Interface ASM G2 safety monitor

Ordering details

Configuration cable with PS2 connector and SUBD 9 connector, Length: 1.8 meter

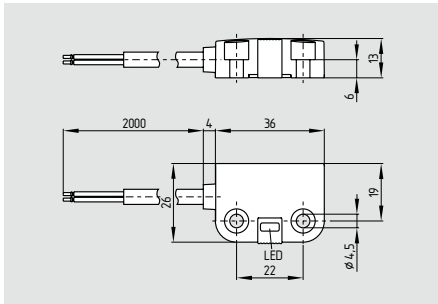
ASM G2-CC

asimon G2 software package

ASM G2-CD

Configuration and diagnostic software version 3.x with documentation on CD-ROM

BNS 260 AS



- **Safety sensor**
- Integrated AS-I interface
- AS-Interface LED
- Available with M12 plug-in connector and pre-wired cable
- Thermoplastic enclosure
- Coded actuator
- Long life, no mechanical wear
- Insensitive to transverse misalignment
- Concealed mounting possible
- Insensitive to soiling
- Protection class IP67

Technical data

Standards: EN 50295, IEC 60947-5-3, EN ISO 13849-1, IEC 61508

Materials:

- Material of the housings: glass-fibre reinforced thermoplastic
- Material of the cable sheath: LSYY

Weight: 104 g

Coding available (Y/N): Yes

Recommended actuator: BPS 260

Response time: < 100 ms

Mechanical data

Design of electrical connection: Cable with connector M12, 4-pole; or cable, 2-pole

Cable length: 2 m

Cable section: 2 x 0.23 mm²

AWG-Number: 23

Mechanical installation conditions: quasi-flush

Ensured switch distance ON S_{ao}: 5 mm

Ensured switch distance OFF S_{ar}: 15 mm

Repeat accuracy R: R ≤ 0.1 x S_{ao}

Type of actuation: magnet

Direction of motion: head-on with regard to the active surface

Resistance to shock: 30 g / 11 ms

Resistance to vibration: 10 ... 55 Hz, amplitude 1 mm

Ambient conditions

Ambient temperature: -25 °C ... +60 °C

Storage and transport temperature: -25 °C ... +70 °C

Protection class: IP67 to IEC/EN 60529

Electrical data - AS interface

AS-i Supply voltage: 26.5 ... 31.6 VDC, protection against polarity reversal

AS-i Operating current: ≤ 50 mA

AS-i Device insulation: internally short-circuit proof

AS-i Specification

- Version: V 2.1

- Profile: S-0.B.F.E

AS-i Inputs

- Channel 1: Data bits DI 0/DI 1= dynamic code transmission

- Channel 2: Data bits DI 2/DI 3= dynamic code transmission

AS-i Outputs

- DO 0 ... DO 3: not used

Technical data

AS-i Parameter bits

- P0 ... P3: not used

AS-i input module address: 0

- Default on address 0, programmable via the AS-Interface Master or Hand-held programming device

AS-i LED switching conditions display

green/red LED (AS-i duo LED):

Supply voltage / communication error / slave address = 0

Dimensions

Dimensions: 36 mm x 26 mm x 13 mm

Classification

Standards: EN ISO 13849-1; IEC 61508

PL: up to e

Category: up to 4

PFH value: 6.21 x 10⁻⁹/h

- Notice: up to max. 500,000 switching cycles/year

SIL: up to 3

Mission time: 20 years

Approvals



Ordering details

BNS 260^①-AS-^②

No.	Option	Description
①	STG	Cable 2 m Cable with connector M12 (straight)
	STW	Cable with connector M12 (angled)
②	L	Door hinge on left-hand side
	R	Door hinge on right-hand side

Note

Pin configuration

M12 connector

4-pole



PIN 1: AS-i + (brown)

PIN 2: spare

PIN 3: AS-i - (blue)

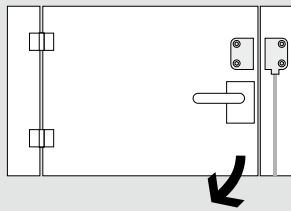
PIN 4: spare

Note

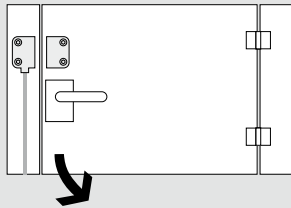
The addressing must take place via the cable end or the M12 connector.

The actuators for the magnetic safety sensors must be ordered separately.

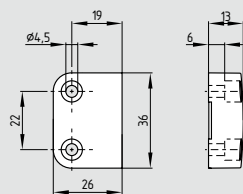
System components



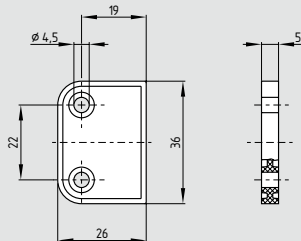
Door hinge on left-hand side



Door hinge on right-hand side

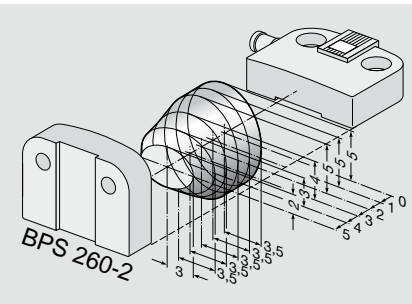
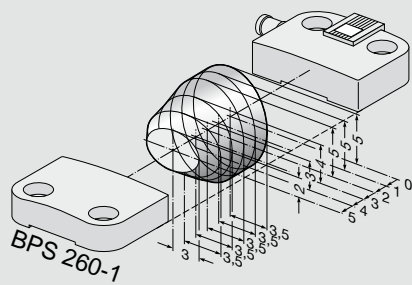


Actuating magnets BPS 260-1/2



Spacer BNS 260

Enabling zones



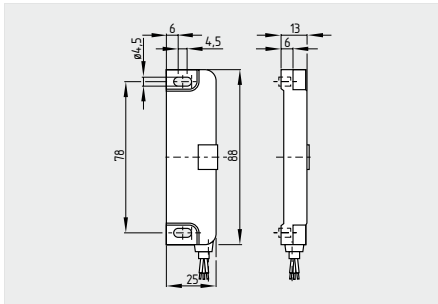
Ordering details

Door hinge on left-hand side suffix -L
 Door hinge on right-hand side suffix -R

Actuating magnet
 Actuator and sensor mounted
 on same fixing plane **BPS 260-1**
 Actuator for 90° fixing **BPS 260-2**

Spacer BNS 260 **1184643**

BNS 36 AS



- **Safety sensor**
- Integrated AS-I interface
- AS-Interface LED and status display
- Available with M12 plug-in connector and pre-wired cable
- Thermoplastic enclosure
- Coded actuator
- Long life, no mechanical wear
- Insensitive to transverse misalignment
- Concealed mounting possible
- Insensitive to soiling
- Protection class IP67

Technical data

Standards: EN 50295, IEC 60947-5-3, EN ISO 13849-1, IEC 61508

Materials:
 - Material of the housings: glass-fibre reinforced thermoplastic
 - Material of the cable sheath: LSYY
 Coding available (Y/N): Yes
 Recommended actuator: BPS 36-1, BPS 36-2
 Response time: < 100 ms

Mechanical data
 Design of electrical connection: Cable with connector
 M12, 4-pole;
 Cable, 2-pole

Cable length: 2 m
 Cable section: 2 x 0.23 mm²
 Mechanical installation conditions: quasi-flush
 Ensured switch distance ON S₃₀: 7 mm
 Ensured switch distance OFF S_{3r}: 17 mm
 Repeat accuracy R: R ≤ 0.1 x S₃₀
 Type of actuation: magnet
 Direction of motion: head-on with regard to the active surface
 Resistance to shock: 30 g / 11 ms
 Resistance to vibration: 10 ... 55 Hz, amplitude 1 mm

Ambient conditions
 Ambient temperature: -25 °C ... +60 °C
 Storage and transport temperature: -25 °C ... +70 °C
 Protection class: IP67 to IEC/EN 60529

Electrical data - AS interface
 AS-i Supply voltage: 26.5 ... 31.6 VDC, protection against polarity reversal
 AS-i Operating current: ≤ 50 mA
 AS-i Device insulation: internally short-circuit proof

AS-i Specification
 - Version: V 2.1
 - Profile: S-0.B.F.E
 AS-i Inputs
 - Channel 1: Data bits DI 0/DI 1= dynamic code transmission
 - Channel 2: Data bits DI 2/DI 3= dynamic code transmission
 AS-i Outputs: DO 0 ... DO 3 not used
 AS-i Parameter bits: P0 ... P3 not used

Technical data

AS-i input module address: 0
 - Default on address 0, programmable via the AS-Interface Master or Hand-held programming device

AS-i LED switching conditions display
 (1) green/red LED (AS-i duo LED):
 Supply voltage / Communication error / Slave address = 0 Enabling status
 (2) yellow LED:

Dimensions
 Dimensions: 88 mm x 25 mm x 13 mm

Classification
 Standards: EN ISO 13849-1, IEC 61508
 PL: up to e
 Category: up to 4
 PFH value: 1.24 x 10⁻⁸/h
 - Notice: up to max. 500,000 switching cycles/year
 SIL: up to 3
 Mission time: 20 years

Approvals



Ordering details

BNS 36^①-AS-^②

No.	Option	Description
①	STG	Cable 2 m Cable with connector M12 (straight)
	STW	Cable with connector M12 (angled)
②	L	Door hinge on left-hand side
	R	Door hinge on right-hand side

The actuators for the magnetic safety sensors must be ordered separately.

Note

Pin configuration

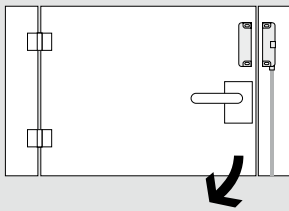
M12 connector
4-pole

 PIN 1: AS-i + (brown)
 PIN 2: spare
 PIN 3: AS-i - (blue)
 PIN 4: spare

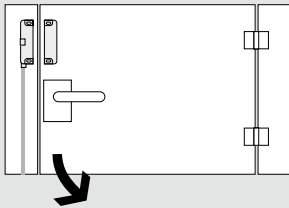
Note

The addressing must take place via the cable end or the M12 connector.

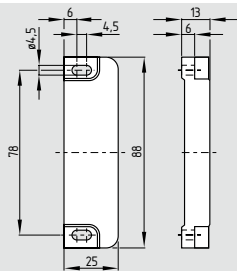
System components



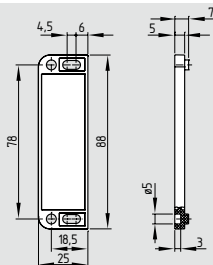
Door hinge on left-hand side



Door hinge on right-hand side

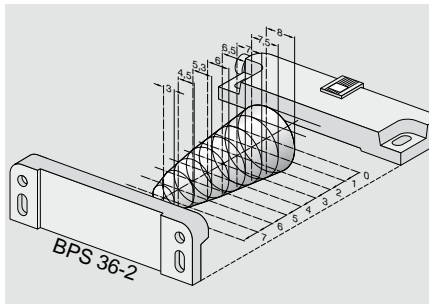
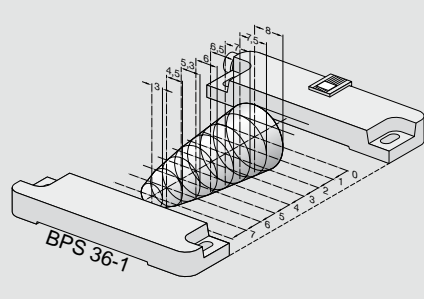


Actuating magnets BPS 36-1/2



Spacer BNS 36

Enabling zones



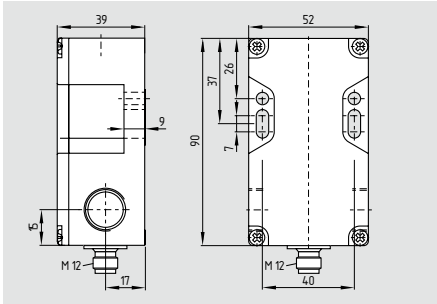
Ordering details

Door hinge on left-hand side **suffix -L**
 Door hinge on right-hand side **suffix -R**

Actuating magnet
 Actuator and sensor mounted
 on same fixing plane **BPS 36-1**
 Actuator for 90° fixing **BPS 36-2**

Spacer BNS 36 **1188624**

BNS 16 AS



- **Safety sensor**
- Integrated AS-I interface
- AS-Interface LED and status display
- AS-Interface M12 connector
- Thermoplastic enclosure
- Coded actuator
- Long life, no mechanical wear
- Insensitive to transverse misalignment
- Concealed mounting possible
- Insensitive to soiling
- Protection class IP67

Technical data

Standards: EN 50295, IEC 60947-5-3, EN ISO 13849-1, IEC 61508
 Material of the housings: plastic, glass-fibre reinforced thermoplastic
 Coding available (Y/N): Yes
 Recommended actuator: BPS 16
 Response time: < 100 ms

Mechanical data

Design of electrical connection: Connector M12, 4-pole
 Mechanical installation conditions: quasi-flush
 Active area: front side, cover-side
 Ensured switch distance ON S_{ao} : 8 mm
 Ensured switch distance OFF S_{ar} : 18 mm
 Repeat accuracy R: $R \leq 0.1 \times S_{ao}$
 Type of actuation: magnet
 Direction of motion: head-on with regard to the active surface
 Resistance to shock: 30 g / 11 ms
 Resistance to vibration: 10 ... 55 Hz, amplitude 1 mm

Ambient conditions

Ambient temperature: -25 °C ... +60 °C
 Storage and transport temperature: -25 °C ... +70 °C
 Protection class: IP67 to IEC/EN 60529

Electrical data - AS interface

AS-i Supply voltage: 26.5 ... 31.6 VDC, protection against polarity reversal
 AS-i Operating current: ≤ 50 mA
 AS-i Device insulation: internally short-circuit proof

AS-i Specification

- Version: V 2.1
 - Profile: S-0.B.F.E

AS-i Inputs

- Channel 1: Data bits DI 0/DI 1= dynamic code transmission
 - Channel 2: Data bits DI 2/DI 3= dynamic code transmission

AS-i Outputs

- DO 0 ... DO 3: not used

AS-i Parameter bits

- P0 ... P3: not used

AS-i input module address: 0

- Default on address 0, programmable via the AS-Interface Master or Hand-held programming device

Technical data

AS-i LED switching conditions display

(1) green LED: Supply voltage
 (2) red LED: Communication error / Slave address = 0
 (3) yellow LED: Enabling status

Dimensions

Dimensions: 40 mm x 90 mm x 38.5 mm

Classification

Standards: EN ISO 13849-1, IEC 61508
 PL: up to e
 Category: up to 4
 PFH value: 7.42×10^{-9} /h
 - Notice: up to max. 500,000 switching cycles/year
 SIL: up to 3
 Mission time: 20 years

Approvals



Ordering details

BNS 16①-AS②

No.	Option	Description
①	ST1	Connector bottom
	ST2	Connector right
	ST3	Connector left
②	V	Actuating planes: front side
	D	cover-side

Note

Pin configuration

M12 connector

4-pole



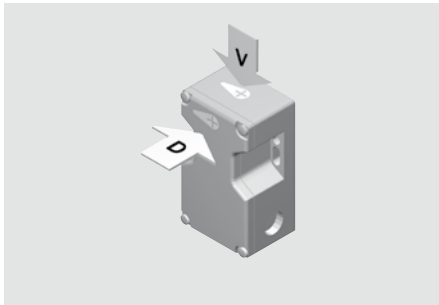
PIN 1: AS-i +
 PIN 2: spare
 PIN 3: AS-i -
 PIN 4: spare

Note

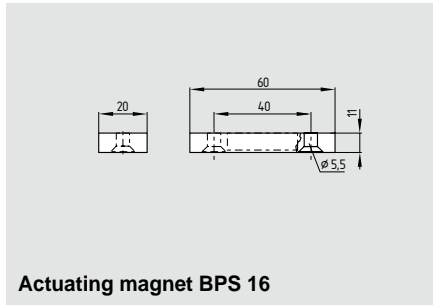
The addressing must take place via the M12 connector.

The actuators for the magnetic safety sensors must be ordered separately.

Actuating planes



System components



Note

2 different actuating planes:

Front side

Cover-side

Ordering suffix V

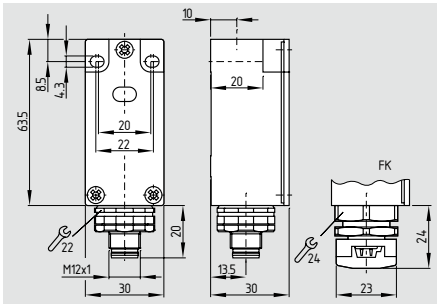
Ordering suffix D

Ordering details

Actuating magnet

BPS 16

Z/T 235 AS



- Position switches with safety functions
- Mounting details to DIN EN 50047
- Metal enclosure
- Integrated AS-I interface
- AS-Interface LED and status display
- AS-Interface M12 connector (turnable) or flat cable connection (turnable)
- Suitable for AS-i Power24
- Wide range of alternative actuators
- Actuator heads can be repositioned by 4 x 90°
- Angle of roller lever adjustable in 10° steps
- Good resistance to oil and petroleum spirit
- Protection class IP67

Technical data

Standards: EN 50295, EN 60947-5-1, EN ISO 13849-1, IEC 61508
 Design: fixings to DIN EN 50047
 Material of the housings: zinc die-cast, enamel finish
 Switching principle: slow or snap action, NC contacts with positive break ⊖
 Response time: < 100 ms

Mechanical data

Execution of the electrical connection: Connector M12, 5-pole, or flat cable connection

Switching frequency: max. 5000/h
 Mechanical life: > 1,000,000 operations
 Max. actuating speed: 1 m/s

Ambient conditions

Ambient temperature: -25 °C ... +60 °C
 Storage and transport temperature: -25 °C ... +85 °C
 Relative humidity: 30 %... 95 %
 - non-condensing
 - non-icing

Protection class: IP67 to IEC/EN 60529
 Resistance to vibration: 10 ... 150 Hz, amplitude 0.35 mm / 5g
 Resistance to shock: 30 g / 11 ms

Electrical data - AS interface

AS-i Supply voltage: 18.0 ... 31.6 VDC, protection against polarity reversal
 AS-i Operating current: ≤ 50 mA
 AS-i Device insulation: internally short-circuit proof

AS-i Specification

- Version: V 3.0
 - Profile: S-0.B.F.F

AS-i Inputs

- Channel 1: Data bits DI 0/DI 1= dynamic code transmission
 - Channel 2: Data bits DI 2/DI 3= dynamic code transmission

AS-i Outputs

- DO 0 ... DO 3: not used

AS-i Parameter bits

- P0: Channel 2 switched
 - P1 ... P3: not used

Technical data

AS-i input module address: 0
 - Default on address 0, programmable via the AS-Interface Master or Hand-held programming device

AS-i LED switching conditions display

(1) yellow LED: Channel 1 / AS-i SaW bit 0.1
 (2) green/red LED (AS-i duo LED):

Supply voltage /
 Communication error /
 Slave address = 0

(3) yellow LED: Channel 2 / AS-i SaW bit 2.3

Classification

If a fault exclusion for hazardous damage of the 1-channel mechanics is authorized and an adequate protection against tampering is ensured, suitable for use up to:

Standards: EN ISO 13849-1, IEC 61508
 PL: up to d
 Category: up to 3
 PFH value: 1.01 x 10⁻⁷/h
 - Notice: up to max. 100,000 switching cycles/year
 SIL: up to 2
 Mission time: 20 years

Basically suitable up to

Standards: EN ISO 13849-1, IEC 61508
 PL: up to c
 Category: up to 1
 PFH value: 1.14 x 10⁻⁶/h
 - Notice: up to max. 100,000 switching cycles/year
 SIL: up to 1
 Mission time: 20 years

Approvals



Ordering details

①② 235 ③-AS

No.	Option	Description
①	Z	Snap action ⊖
	T	Slow action ⊖
②	For the appropriate actuator: see as of page 20	
③	ST	Connector M12, metal
	FK	Flat cable connection

Note

Pin configuration

M12 connector

5-pole

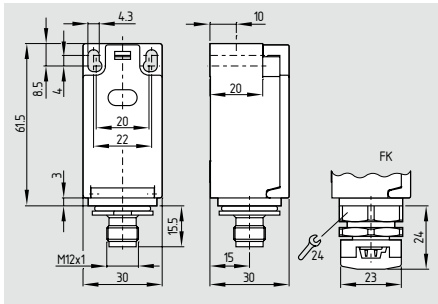


PIN 1: AS-i +
 PIN 2: spare
 PIN 3: AS-i -
 PIN 4: spare
 PIN 5: FE (Functional earth connection)

Note

Addressing through the M12 connector or the flat cable connection

Z/T 236 AS



- Position switches with safety functions
- Mounting details to DIN EN 50047
- Thermoplastic enclosure
- Integrated AS-I interface
- AS-Interface LED and status display
- AS-Interface M12 connector, or flat cable connection (turnable)
- Suitable for AS-i Power24
- Wide range of alternative actuators
- Actuator heads can be repositioned by 4 x 90°
- Angle of roller lever adjustable in 10° steps
- Good resistance to oil and petroleum spirit
- Protection class IP67

Approvals



Ordering details

①② 236 ③-AS

No.	Option	Description
①	Z	Snap action ⊖
	T	Slow action ⊖
②		For the appropriate actuator: see as of page 20
③	ST	Connector M12, plastic
	FK	Flat cable connection

Technical data

Standards: EN 50295, EN 60947-5-1, EN ISO 13849-1, IEC 61508
 Design: fixings to DIN EN 50047
 Material of the housings: plastic, glass-fibre reinforced thermoplastic, self-extinguishing
 Switching principle: slow or snap action, NC contacts with positive break ⊖
 Response time: < 100 ms

Mechanical data

Execution of the electrical connection: Connector M12, 4-pole, or flat cable connection
 Switching frequency: max. 5000/h
 Mechanical life: > 1,000,000 operations
 Max. actuating speed: 1 m/s

Ambient conditions

Ambient temperature: -25 °C ... +60 °C
 Storage and transport temperature: -25 °C ... +85 °C
 Relative humidity: 30 %... 95 %
 - non-condensing
 - non-icing
 Protection class: IP67 to IEC/EN 60529
 Protection rating: II, III
 Resistance to vibration: 10 ... 150 Hz, amplitude 0.35 mm / 5g
 Resistance to shock: 30 g / 11 ms

Electrical data - AS interface

AS-i Supply voltage: 18.0 ... 31.6 VDC, protection against polarity reversal
 AS-i Operating current: ≤ 50 mA
 AS-i Device insulation: internally short-circuit proof

AS-i Specification

- Version: V 3.0
 - Profile: S-0.B.F.F
 AS-i Inputs
 - Channel 1: Data bits DI 0/DI 1= dynamic code transmission
 - Channel 2: Data bits DI 2/DI 3= dynamic code transmission
 AS-i Outputs
 - DO 0 ... DO 3: not used
 AS-i Parameter bits
 - P0: Channel 2 switched
 - P1 ... P3: not used

Note

Pin configuration

M12 connector

4-pole

 PIN 1: AS-i +
 PIN 2: spare
 PIN 3: AS-i -
 PIN 4: spare

Technical data

AS-i input module address: 0
 - Default on address 0, programmable via the AS-Interface Master or Hand-held programming device

AS-i LED switching conditions display

(1) yellow LED: Channel 1 / AS-i SaW bit 0.1
 (2) green/red LED (AS-i duo LED):
 Supply voltage /
 Communication error /
 Slave address = 0 /
 periphery error
 (3) yellow LED: Channel 2 / AS-i SaW bit 2.3

Classification

If a fault exclusion for hazardous damage of the 1-channel mechanics is authorized and an adequate protection against tampering is ensured, suitable for use up to:
 Standards: EN ISO 13849-1, IEC 61508
 PL: up to d
 Category: up to 3
 PFH value: 1.01 x 10⁻⁷/h
 - Notice: up to max. 100,000 switching cycles/year
 SIL: up to 2
 Mission time: 20 years

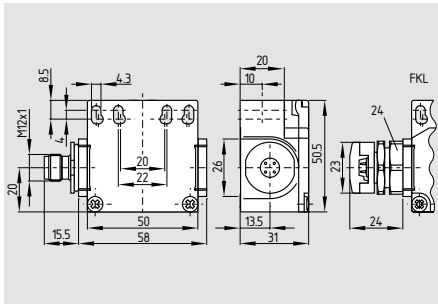
Basically suitable up to

Standards: EN ISO 13849-1, IEC 61508
 PL: up to c
 Category: up to 1
 PFH value: 1.14 x 10⁻⁶/h
 - Notice: up to max. 100,000 switching cycles/year
 SIL: up to 1
 Mission time: 20 years

Note

Addressing through the M12 connector or the flat cable connection

Z/T 256 AS



- Position switches with safety functions
- Mounting details to DIN EN 50047
- Thermoplastic enclosure
- Integrated AS-I interface
- AS-Interface LED and status display
- AS-Interface M12 connector, or flat cable connection (turnable)
- Suitable for AS-i Power24
- Wide range of alternative actuators
- Actuator heads can be repositioned by 4 x 90°
- Angle of roller lever adjustable in 10° steps
- Good resistance to oil and petroleum spirit
- Protection class IP67

Technical data

Standards: EN 50295, EN 60947-5-1, EN ISO 13849-1, IEC 61508
 Design: fixings to DIN EN 50047
 Material of the housings: plastic, glass-fibre reinforced thermoplastic, self-extinguishing
 Switching principle: slow or snap action, NC contacts with positive break ⊖
 Response time: < 100 ms

Mechanical data

Execution of the electrical connection: Connector M12, 4-pole, or flat cable connection
 Switching frequency: max. 5000/h
 Mechanical life: > 1,000,000 operations
 Max. actuating speed: 1 m/s

Ambient conditions

Ambient temperature: -25 °C ... +60 °C
 Storage and transport temperature: -25 °C ... +85 °C
 Relative humidity: 30 %... 95 %
 - non-condensing
 - non-icing
 Protection class: IP67 to IEC/EN 60529
 Protection rating: II, Ⓜ
 Resistance to vibration: 10 ... 150 Hz, amplitude 0.35 mm / 5g
 Resistance to shock: 30 g / 11 ms

Electrical data - AS interface

AS-i Supply voltage: 18.0 ... 31.6 VDC, protection against polarity reversal
 AS-i Operating current: ≤ 50 mA
 AS-i Device insulation: internally short-circuit proof
 AS-i Specification
 - Version: V 3.0
 - Profile: S-0.B.F.F
 AS-i Inputs
 - Channel 1: Data bits DI 0/DI 1= dynamic code transmission
 - Channel 2: Data bits DI 2/DI 3= dynamic code transmission
 AS-i Outputs
 - DO 0 ... DO 3: not used

Technical data

AS-i Parameter bits
 - P0: Channel 2 switched
 - P1 ... P3: not used
 AS-i input module address: 0
 - Default on address 0, programmable via the AS-Interface Master or Hand-held programming device

AS-i LED switching conditions display

(1) yellow LED: Channel 1 / AS-i SaW bit 0.1
 (2) green/red LED (AS-i duo LED):
 Supply voltage / Communication error / Slave address = 0 / periphery error
 (3) yellow LED: Channel 2 / AS-i SaW bit 2.3

Classification

If a fault exclusion for hazardous damage of the 1-channel mechanics is authorized and an adequate protection against tampering is ensured, suitable for use up to:
 Standards: EN ISO 13849-1, IEC 61508
 PL: up to d
 Category: up to 3
 PFH value: 1.01 x 10⁻⁷/h
 - Notice: up to max. 100,000 switching cycles/year
 SIL: up to 2
 Mission time: 20 years

Basically suitable up to

Standards: EN ISO 13849-1, IEC 61508
 PL: up to c
 Category: up to 1
 PFH value: 1.14 x 10⁻⁶/h
 - Notice: up to max. 100,000 switching cycles/year
 SIL: up to 1
 Mission time: 20 years

Approvals



Ordering details

①② 256 ③-AS

No.	Option	Description
①	Z	Snap action ⊖
	T	Slow action ⊖
②	For the appropriate actuator: see as of page 20	
③	STR	Connector M12, right
	STL	Connector M12, left
	FKR	Flat cable connection, right
	FKL	Flat cable connection, left

Note

Pin configuration

M12 connector

4-pole

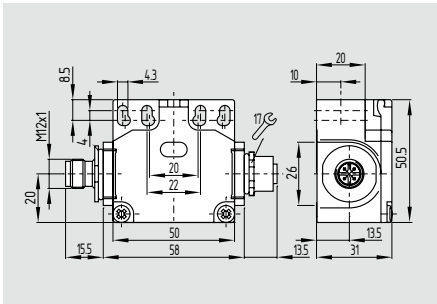


PIN 1: AS-i +
 PIN 2: spare
 PIN 3: AS-i -
 PIN 4: spare

Note

Addressing through the M12 connector or the flat cable connection

Z/T 256 AS 2S



- **Position switch for safety functions with integrated AS-i Safety electronics and M12 connector for the connection of a second position switch**
- Channel 1, internal contact of the Z/T 256 AS 2S
- Channel 2, on M12 connector for contact of the second position switch
- Mounting details to DIN EN 50047
- Thermoplastic enclosure
- Integrated AS-I interface
- AS-Interface LED and status display
- AS-Interface M12 connector, or flat cable connection (turnable)
- Suitable for AS-i Power24
- Wide range of alternative actuators
- Actuator heads can be repositioned by 4 x 90°
- Angle of roller lever adjustable in 10° steps
- Good resistance to oil and petroleum spirit
- Protection class IP67

Approvals



Ordering details

①② 256 ③-AS 2S

No.	Option	Description
①	Z	Snap action ⊖
	T	Slow action ⊖
②		For the appropriate actuator: see as of page 20
③	STL	Connector plug M 12, left
	FKL	Flat cable connection, left

Technical data

Standards: EN 50295, EN 60947-5-1, EN ISO 13849-1, IEC 61508
 Design: fixings to DIN EN 50047
 Material of the housings: plastic, glass-fibre reinforced thermoplastic, self-extinguishing
 Switching principle: slow or snap action, NC contacts with positive break ⊖
 Response time: < 100 ms

Mechanical data

Execution of the electrical connection, AS-i: Connector M12, 4-pole, or flat cable connection
 Execution of the electrical connection, 2nd switch: Connector M12, 4-pole
 Switching frequency: max. 5000/h
 Mechanical life: > 1,000,000 operations
 Max. actuating speed: 1 m/s

Ambient conditions

Ambient temperature: -25 °C ... +60 °C
 Storage and transport temperature: -25 °C ... +85 °C
 Relative humidity: 30 %... 95 %
 - non-condensing
 - non-icing
 Protection class: IP67 to IEC/EN 60529
 Protection rating: II,
 Resistance to vibration: 10 ... 150 Hz, amplitude 0.35 mm / 5g
 Resistance to shock: 30 g / 11 ms

Electrical data - AS interface

AS-i Supply voltage: 18.0 ... 31.6 VDC, protection against polarity reversal
 AS-i Operating current: ≤ 50 mA
 AS-i Device insulation: internally short-circuit proof

AS-i Specification

- Version: V 3.0
 - Profile: S-0.B.F.F
 AS-i Inputs
 - Channel 1: Data bits DI 0/DI 1= dynamic code transmission (Z/T 256 AS)
 - Channel 2: Data bits DI 2/DI 3= dynamic code transmission (2nd switch)
 AS-i Outputs
 - DO 0 ... DO 3: not used

Note

Pin configuration AS-i M12 connector

4-pole

Contact configuration M12 connector 2nd switch

4-pole

Technical data

AS-i Parameter bits
 - P0: Channel 2 switched, Switching condition 2nd switch
 - P1 ... P3: not used
 AS-i input module address: 0
 - Default on address 0, programmable via the AS-Interface Master or Hand-held programming device

AS-i LED switching conditions display

(1) yellow LED: Channel 1 / AS-i SaW bit 0.1 Switching condition Z/T 256 AS 2S
 (2) green/red LED (AS-i duo LED): Supply voltage / Communication error / Slave address = 0 / periphery error
 (3) yellow LED: Channel 2 / AS-i SaW bit 2.3 Switching condition 2nd switch

Classification

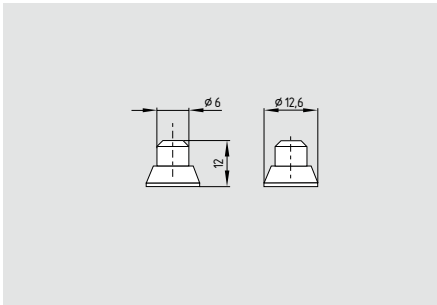
Application: Two position switches, dependent, on one safety guard:
 Standards: EN ISO 13849-1, IEC 61508
 PL: up to e
 Category: up to 4
 PFH value: 2.0 x 10⁻⁶/h
 - Notice: up to max. 100,000 switching cycles/year
 SIL: up to 2
 Mission time: 20 years

Application: Each time one position switch, independent, on two safety guards:
 Standards: EN ISO 13849-1, IEC 61508
 PL: up to c
 Category: up to 1
 PFH value: 1.14 x 10⁻⁶/h
 - Notice: up to max. 100,000 switching cycles/year
 SIL: up to 1
 Mission time: 20 years

Note

Addressing through the M12 connector or the flat cable connection

Plunger S

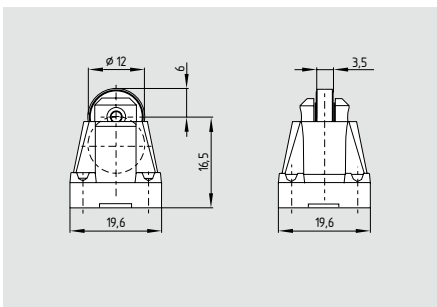


- Actuator type B to EN 50047
- Actuating force: Min. 9 N
- Positive break force: 19 N
- Actuating speed with actuating angle 0° to switch axis max. 1 m/s

Contact variants

Contacts/ Switch travel	Snap action	Slow action
2 NC	ZS 2...-AS 	TS 2...-AS

Roller plunger R

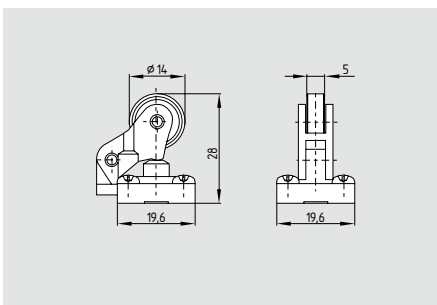


- Actuator type C to EN 50047
- Actuating force: Min. 9 N
- Positive break force: 19 N
- Actuating speed with actuating angle 30° to switch axis max. 1 m/s

Contact variants

Contacts/ Switch travel	Snap action	Slow action
2 NC	ZR 2...-AS 	TR 2...-AS

Offset roller lever 1R

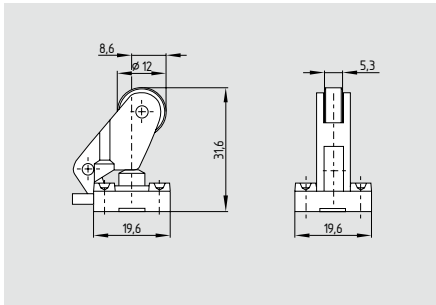


- Actuating force: Min. 9 N
- Positive break force: 19 N
- Actuating speed with actuating angle 30° to switch axis max. 1 m/s

Contact variants

Contacts/ Switch travel	Snap action	Slow action
2 NC	Z1R 2...-AS 	T1R 2...-AS

Angle roller lever K

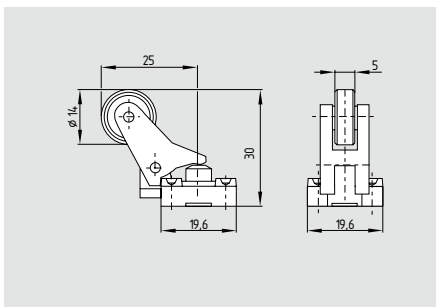


- Actuator type E to EN 50047
- Actuating force: Min. 9 N
- Positive break force: 19 N
- Actuating speed with actuating angle 30° to switch axis max. 1 m/s

Contact variants

Contacts/ Switch travel	Snap action	Slow action
2 NC	ZK 2...-AS 	TK 2...-AS

Angle roller lever 3K

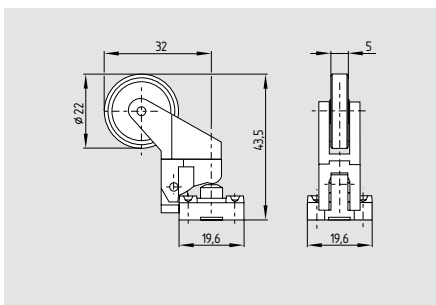


- Actuating force: Min. 9 N
- Positive break force: 19 N
- Actuating speed with actuating angle 30° to switch axis max. 1 m/s
- Actuation from bottom parallel to the switch, therefore only suitable for small housings (Z/T 235 and Z/T 236)

Contact variants

Contacts/ Switch travel	Snap action	Slow action
2 NC	Z3K 2...-AS 	T3K 2...-AS

Angle roller lever 4K

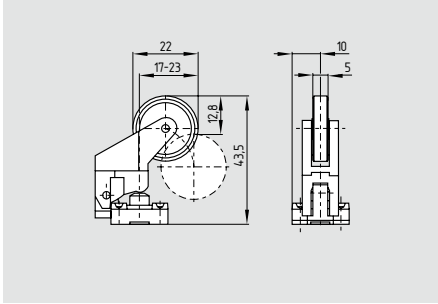


- Actuating force: Min. 6 N
- Positive break force: 16 N
- Actuating speed with actuating angle 30° to switch axis max. 1 m/s
- Actuation from bottom parallel to the switch, therefore only suitable for small housings (Z/T 235 and Z/T 236)

Contact variants

Contacts/ Switch travel	Snap action	Slow action
2 NC	Z4K 2...-AS 	T4K 2...-AS

Angle roller lever K4

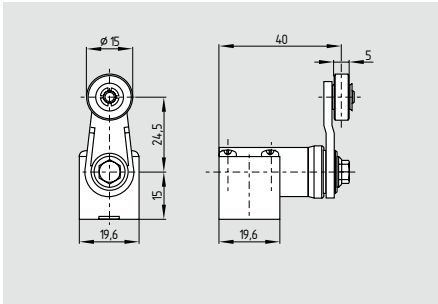


- Actuating force: Min. 6 N
- Positive break force: 16 N
- Actuating speed with actuating angle 30° to switch axis max. 1 m/s

Contact variants

Contacts/ Switch travel	Snap action	Slow action
2 NC	ZK4 2...-AS 	TK4 2...-AS

Roller lever V1H

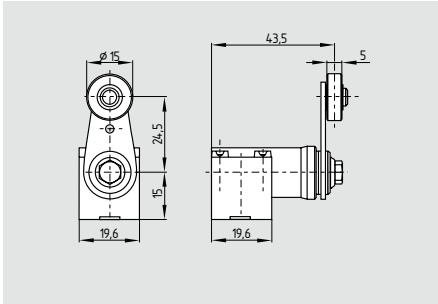


- Plastic lever
- Actuator type A to EN 50047
- Lever angle adjustable in 10° steps
- Actuating torque: Min. 15 Ncm
- Positive break torque: 18.5 Ncm
- Actuating speed with actuating angle 30° to switch axis max. 1 m/s
- Actuator head gasket, ordering suffix -Z

Contact variants

Contacts/ Switch travel	Snap action	Slow action
2 NC	ZV1H 2...-AS 	TV1H 2...-AS

Roller lever V12H

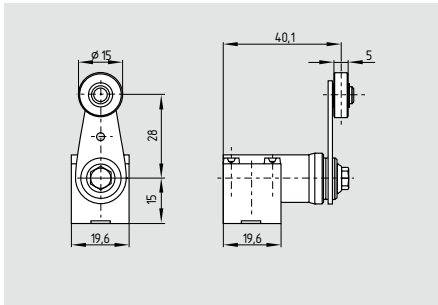


- Metal lever with plastic roller
- Actuator type A to EN 50047
- Lever angle adjustable in 10° steps
- Actuating torque: Min. 15 Ncm
- Positive break torque: 18.5 Ncm
- Actuating speed with actuating angle 30° to switch axis max. 1 m/s
- Actuator head gasket, ordering suffix -Z
- With metal roller, ordering suffix -RMS

Contact variants

Contacts/ Switch travel	Snap action	Slow action
2 NC	ZV12H 2...-AS 	TV12H 2...-AS

Roller lever V14H

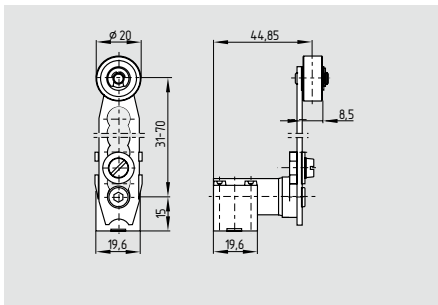


- Metal lever with plastic roller
- Actuator type A to EN 50047
- Lever angle adjustable in 10° steps
- Actuating torque: Min. 15 Ncm
- Positive break torque: 18.5 Ncm
- Actuating speed with actuating angle 30° to switch axis max. 1 m/s
- Actuator head gasket, ordering suffix -Z
- With metal roller, ordering suffix -RMS

Contact variants

Contacts/ Switch travel	Snap action	Slow action
2 NC	ZV14H 2...-AS 	TV14H 2...-AS

Roller lever V7H-2138

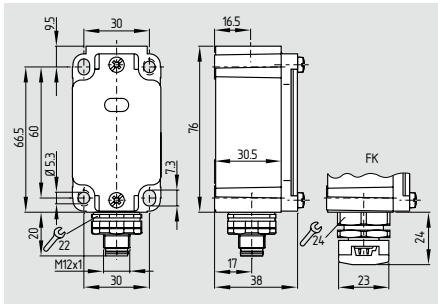


- Lever angle adjustable in 10° steps
- Actuating torque: Min. 15 Ncm
- Positive break torque: 18.5 Ncm
- Actuating speed with actuating angle 30° to switch axis max. 1 m/s
- Actuator head gasket, ordering suffix -Z

Contact variants

Contacts/ Switch travel	Snap action	Slow action
2 NC	ZV7H 2...-AS-2138 	TV7H 2...-AS-2138

T 335 AS



- Position switches with safety functions
- Mounting details to DIN EN 50041
- Metal enclosure
- Integrated AS-I interface
- AS-Interface LED and status display
- AS-Interface M12 connector (turnable) or flat cable connection (turnable)
- Suitable for AS-i Power24
- Wide range of alternative actuators
- Actuator heads can be repositioned by 4 x 90°
- Angle of roller lever adjustable in 10° steps
- Good resistance to oil and petroleum spirit
- Protection class IP67

Approvals



Ordering details

T 335 2-AS

No.	Option	Description
①	T	Slow action ⊖
①		For the appropriate actuator: see as of page 26
②	ST	Connector M12, metal
	FK	Flat cable connection

Technical data

Standards: EN 50295, EN 60947-5-1, EN ISO 13849-1, IEC 61508
 Design: fixings to DIN EN 50041
 Material of the housings: zinc die-cast, enamel finish
 Switching principle: slow action, NC contacts with positive break ⊖

Response time: < 100 ms

Mechanical data

Execution of the electrical connection: Connector M12, 5-pole, or flat cable connection

Switching frequency: max. 5000/h
 Mechanical life: > 1,000,000 operations
 Max. actuating speed: 1 m/s

Ambient conditions

Ambient temperature: -25 °C ... +60 °C
 Storage and transport temperature: -25 °C ... +85 °C
 Relative humidity: 30 %... 95 %
 - non-condensing
 - non-icing

Protection class: IP67 to IEC/EN 60529
 Resistance to vibration: 10 ... 150 Hz, amplitude 0.35 mm / 5g
 Resistance to shock: 30 g / 11 ms

Electrical data - AS interface

AS-i Supply voltage: 18.0 ... 31.6 VDC, protection against polarity reversal
 AS-i Operating current: ≤ 50 mA
 AS-i Device insulation: internally short-circuit proof

AS-i Specification

- Version: V 3.0
 - Profile: S-0.B.F.F

AS-i Inputs

- Channel 1: Data bits DI 0/DI 1= dynamic code transmission
 - Channel 2: Data bits DI 2/DI 3= dynamic code transmission

AS-i Outputs

- DO 0 ... DO 3: not used

AS-i Parameter bits

- P0: Channel 2 switched
 - P1 ... P3: not used

Technical data

AS-i input module address: 0
 - Default on address 0, programmable via the AS-Interface Master or Hand-held programming device

AS-i LED switching conditions display

(1) yellow LED: Channel 1 / AS-i SaW bit 0.1
 (2) green/red LED (AS-i duo LED):

Supply voltage / Communication error / Slave address = 0

(3) yellow LED: Channel 2 / AS-i SaW bit 2.3

Classification

If a fault exclusion for hazardous damage of the 1-channel mechanics is authorized and an adequate protection against tampering is ensured, suitable for use up to:

Standards: EN ISO 13849-1, IEC 61508
 PL: up to d
 Category: up to 3
 PFH value: 1.01 x 10⁻⁷/h
 - Notice: up to max. 100,000 switching cycles/year

SIL: up to 2

Mission time: 20 years

Basically suitable up to

Standards: EN ISO 13849-1, IEC 61508

PL: up to c
 Category: up to 1
 PFH value: 1.14 x 10⁻⁶/h
 - Notice: up to max. 100,000 switching cycles/year

SIL: up to 1

Mission time: 20 years

Note

Pin configuration

M12 connector

5-pole

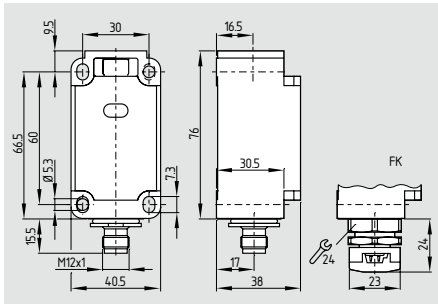


PIN 1: AS-i +
 PIN 2: spare
 PIN 3: AS-i -
 PIN 4: spare
 PIN 5: FE (Functional earth connection)

Note

Addressing through the M12 connector or the flat cable connection

T 336 AS



- Position switches with safety functions
- Mounting details to DIN EN 50041
- Thermoplastic enclosure
- Integrated AS-I interface
- AS-Interface LED and status display
- AS-Interface M12 connector, or flat cable connection (turnable)
- AS-i Power24 geeignet
- Wide range of alternative actuators
- Actuator heads can be repositioned by 4 x 90°
- Angle of roller lever adjustable in 10° steps
- Good resistance to oil and petroleum spirit
- Protection class IP67

Approvals



Ordering details

T 336 2-AS

No.	Option	Description
①	T = Slow action ⊖	For the appropriate actuator: see as of page 26
②	ST	Connector M12, metal
	FK	Flat cable connection

Technical data

Standards: EN 50295, EN 60947-5-1, EN ISO 13849-1, IEC 61508
 Design: fixings to DIN EN 50041
 Material of the housings: plastic, glass-fibre reinforced thermoplastic, self-extinguishing
 Switching principle: slow action, NC contacts with positive break ⊖

Response time: < 100 ms

Mechanical data

Execution of the electrical connection: Connector M12, 4-pole, or flat cable connection

Switching frequency: max. 5000/h

Mechanical life: > 1,000,000 operations

Max. actuating speed: 1 m/s

Ambient conditions

Ambient temperature: -25 °C ... +60 °C

Storage and transport temperature: -25 °C ... +85 °C

Relative humidity: 30 % ... 95 %

- non-condensing

- non-icing

Protection class: IP67 to IEC/EN 60529

Protection rating: II, III

Resistance to vibration: 10 ... 150 Hz, amplitude 0.35 mm / 5g

Resistance to shock: 30 g / 11 ms

Electrical data - AS interface

AS-i Supply voltage: 18.0 ... 31.6 VDC, protection against polarity reversal

AS-i Operating current: ≤ 50 mA

AS-i Device insulation: internally short-circuit proof

AS-i Specification

- Version: V 3.0

- Profile: S-0.B.F.F

AS-i Inputs

- Channel 1: Data bits DI 0/DI 1= dynamic code transmission

- Channel 2: Data bits DI 2/DI 3= dynamic code transmission

AS-i Outputs

- DO 0 ... DO 3: not used

AS-i Parameter bits

- P0: Channel 2 switched

- P1 ... P3: not used

Technical data

AS-i input module address: 0

- Default on address 0, programmable via the AS-Interface Master or Hand-held programming device

AS-i LED switching conditions display

(1) yellow LED: Channel 1 / AS-i SaW bit 0.1

(2) green/red LED (AS-i duo LED):

Supply voltage /

Communication error /

Slave address = 0 /

periphery error

(3) yellow LED: Channel 2 / AS-i SaW bit 2.3

Classification

If a fault exclusion for hazardous damage of the 1-channel mechanics is authorized and an adequate protection against tampering is ensured, suitable for use up to:

Standards: EN ISO 13849-1, IEC 61508

PL: up to d

Category: up to 3

PFH value: 1.01 x 10⁻⁷/h

- Notice: up to max. 100,000 switching cycles/year

SIL: up to 2

Mission time: 20 years

Basically suitable up to

Standards: EN ISO 13849-1, IEC 61508

PL: up to c

Category: up to 1

PFH value: 1.14 x 10⁻⁶/h

- Notice: up to max. 100,000 switching cycles/year

SIL: up to 1

Mission time: 20 years

Note

Pin configuration

M12 connector

4-pole



PIN 1: AS-i +

PIN 2: spare

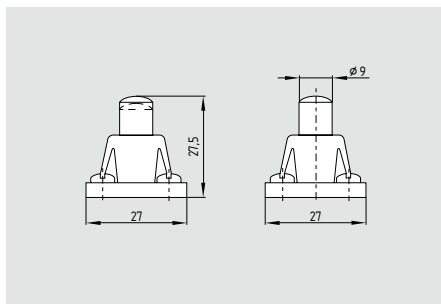
PIN 3: AS-i -

PIN 4: spare

Note

Addressing through the M12 connector or the flat cable connection

Plunger S

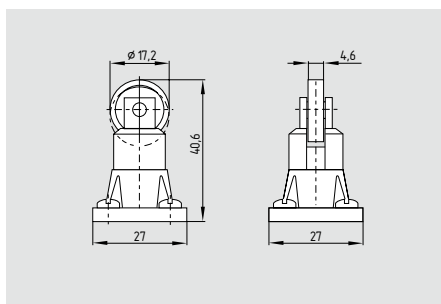


- Actuator type B to EN 50041
- Actuating force: Min. 17 N
- Actuating speed with actuating angle 0° to switch axis max. 0.5 m/s

Contact variants

Contacts/ Switch travel	Slow action
2 NC	TS 3...-AS

Roller plunger R

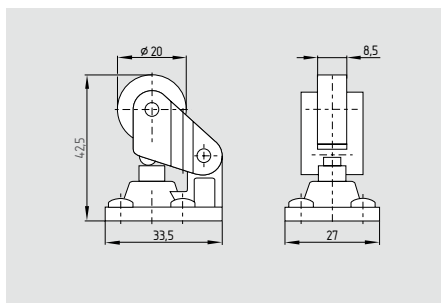


- Actuator type C to EN 50041
- Actuating force: Min. 17 N
- Actuating speed with actuating angle 30° to switch axis max. 0.5 m/s

Contact variants

Contacts/ Switch travel	Slow action
2 NC	TR 3...-AS

Angle roller lever 1K



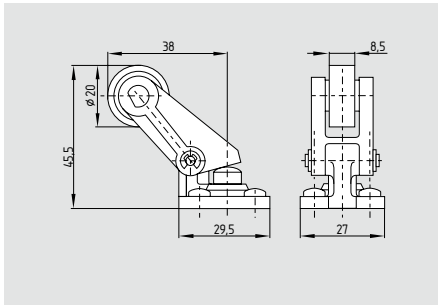
- Actuating force: Min. 17 N
- Actuating speed with actuating angle 30° to switch axis max. 0.5 m/s

Contact variants

Contacts/ Switch travel	Slow action
2 NC	T1K 3...-AS

AS-Interface Safety at Work

Angle roller lever 3K

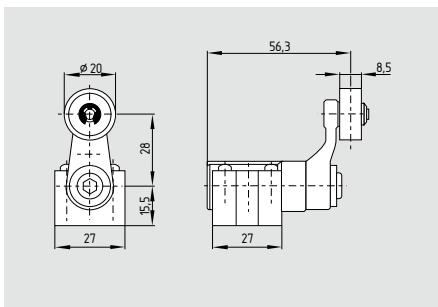


- Actuating force: Min. 17 N
- Actuating speed with actuating angle 30° to switch axis max. 0.5 m/s
- Actuation parallel to axis of switch from below

Contact variants

Contacts/ Switch travel	Slow action
2 NC	T3K 3...-AS

Roller lever VH/V1H

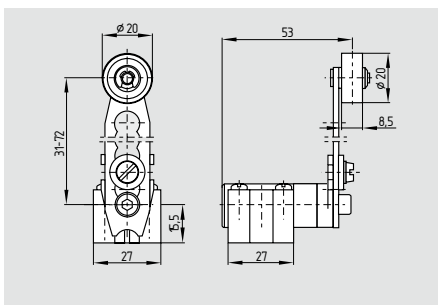


- Actuator type A to EN 50041
- Actuating torque: Min. 31 Ncm
- Actuating speed with actuating angle 30° to switch axis max. 1 m/s
- Also with plastic roller 25 mm available, ordering suffix 1H
- With metal roller, ordering suffix -RMS

Contact variants

Contacts/ Switch travel	Slow action
2 NC	T4VH 3...-AS T4V1H 3...-AS

Roller lever V7H-2138

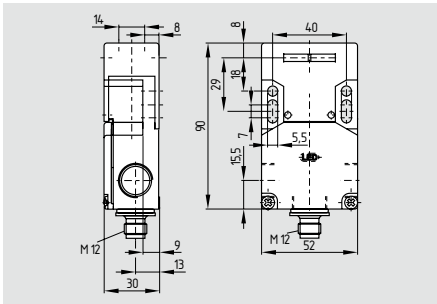


- Actuating torque: Min. 31 Ncm
- Actuating speed with actuating angle 30° to switch axis max. 1 m/s

Contact variants

Contacts/ Switch travel	Slow action
2 NC	T4V7H 3...-AS-2138

AZ 16 AS



- Safety switch with separate actuator
- Integrated AS-I interface
- AS-Interface LED and status display
- AS-Interface M12 connector
- Thermoplastic enclosure
- Coded actuator
- Long life
- Protection class IP67

Technical data

Standards: EN 60947-5-1, EN 50295, EN ISO 13849-1, IEC 61508
 Material of the housings: glass-fibre reinforced thermoplastic, self-extinguishing

Response time: < 100 ms

Mechanical data

Design of electrical connection: Connector M12, 4-pole
 Mechanical life: > 1,000,000 operations
 Latching force: without; 5 N; 30 N
 Max. actuating speed: 2 m/s

Ambient conditions

Ambient temperature: -25 °C ... +60 °C
 Storage and transport temperature: -25 °C ... +85 °C
 Protection class: IP67 to IEC/EN 60529
 Protection rating: II

Electrical data - AS interface

AS-i Supply voltage: 26.5 ... 31.6 VDC, protection against polarity reversal
 AS-i Operating current: ≤ 50 mA
 AS-i Device insulation: internally short-circuit proof

AS-i Specification

- Version: V 2.1
 - Profile: S-0.B.F.E

AS-i Inputs

- Channel 1: Data bits DI 0/DI 1= dynamic code transmission
 - Channel 2: Data bits DI 2/DI 3= dynamic code transmission

AS-i Parameter bits: P0 ... P3 not used
 - Set the parameter outputs to „1111“ (0xF)
 AS-i input module address: 0
 - Default on address 0, programmable via the AS-Interface Master or Hand-held programming device

AS-i LED switching conditions display

(1) green LED: Supply voltage
 (2) red LED: Communication error / Slave address = 0
 (3) yellow LED: Enabling status

Dimensions

Dimensions: 52 mm x 30 mm x 90 mm

Technical data

Classification

If a fault exclusion for hazardous damage of the 1-channel mechanics is authorized and an adequate protection against tampering is ensured, suitable for use up to:

PL: up to d
 Category: 3
 PFH Wert: 1.01 x 10⁻⁷/h
 - Notice: up to max. 100,000 switching cycles/year
 SIL: up to 2
 Mission time: 20 years

Basically suitable up to

Standards: EN ISO 13849-1, IEC 61508
 PL: up to c
 Category: 1
 PFH value: 1.14 x 10⁻⁶/h
 - Notice: up to max. 100,000 switching cycles/year
 SIL: up to 1
 Mission time: 20 years

Approvals



Ordering details

AZ 16 ①-AS ②

No.	Option	Description
①	ST1	Connector bottom
	ST2	Connector right
	ST3	Connector left
②		No latching
	R R-2254	Latching force 30 N Latching force 5 N

Actuators must be ordered separately.

Note

Pin configuration

M12 connector

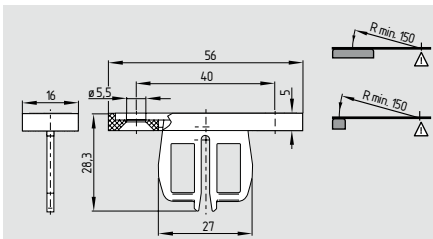
4-pole

 PIN 1: AS-i +
 PIN 2: spare
 PIN 3: AS-i -
 PIN 4: spare

Note

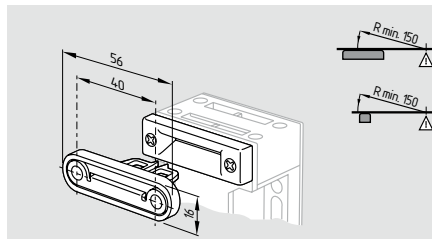
The addressing must take place via the M12 connector.

System components



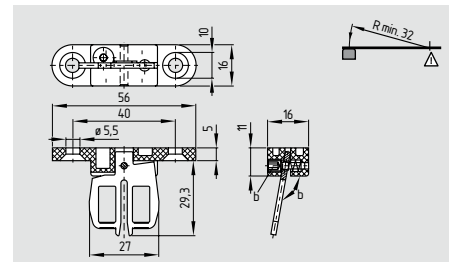
Straight actuator AZ 15/16-B1

System components

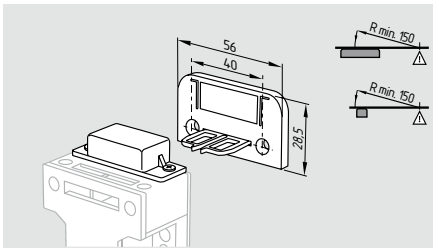


AZ 15/16-B1-2177 with centering guide

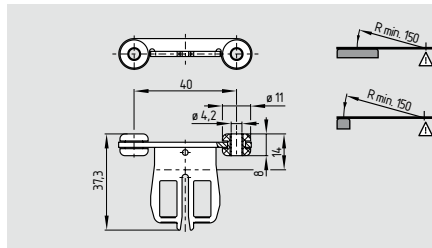
System components



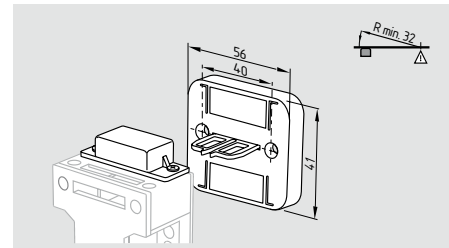
Flexible actuator AZ 15/16-B3



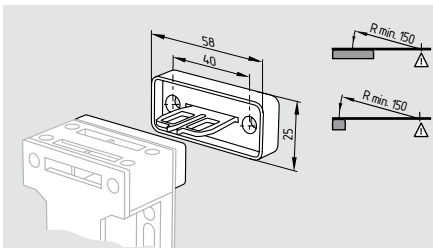
AZ 15/16-B1-1747 with magnetic latch



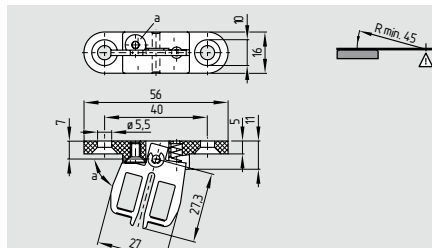
AZ 15/16-B1-2245 with rubber mounting



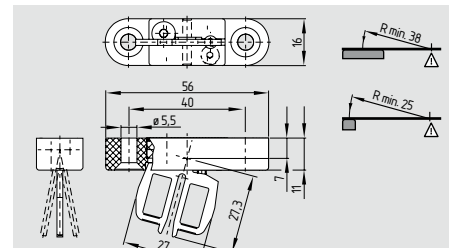
AZ 15/16-B3-1747 with magnetic latch



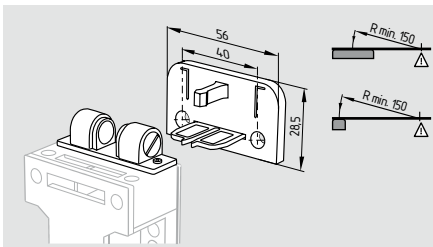
AZ 15/16-B1-2024 with slot lip-seal



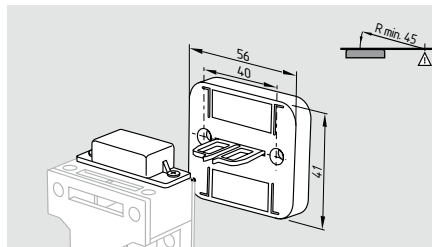
Flexible actuator AZ 15/16-B2



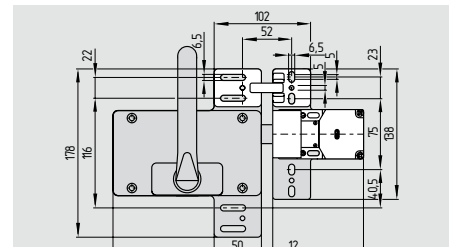
Flexible actuator AZ 15/16-B6



AZ 15/16-B1-2053 with ball latch



AZ 15/16-B2-1747 with magnetic latch



Actuator AZ 16-ST30

Ordering details

Straight actuator
with magnetic latch
with slot lip-seal
with ball latch

AZ 15/16-B1
AZ 15/16-B1-1747
AZ 15/16-B1-2024
AZ 15/16-B1-2053

Ordering details

Straight actuator
with centering guide
with rubber mounting
Flexible actuator
with magnetic latch

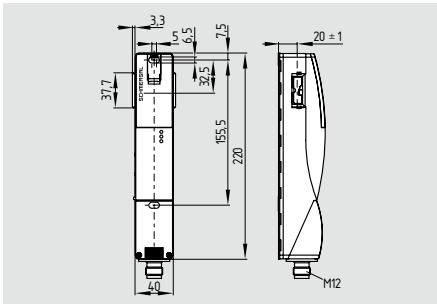
AZ 15/16-B1-2177
AZ 15/16-B1-2245
AZ 15/16-B2
AZ 15/16-B2-1747

Ordering details

Flexible actuator
with magnetic latch
Flexible actuator
Actuator with or without
emergency handle

AZ 15/16-B3
AZ 15/16-B3-1747
AZ 15/16-B6
AZ 16-ST30

AZ 200 AS



- **Safety switches with separate actuator**
 - With integrated guard detection sensor
 - Integrated AS-Interface
 - AS-Interface LED and status display
 - AS-Interface M12 connector
 - Sensor technology permits an offset between actuator and switch of ± 5 mm
 - Intelligent diagnosis
 - Protection class IP67
- **Suitable for applications:**
 - up to PL e / category 4 to EN ISO 13849-1
 - up to SIL 3 to IEC/EN 61508

Technical data

Standards: IEC 60947-5-3, IEC 61508, EN ISO 13849-1, EN 60947-5-1, EN 50295
 Active principle: Non-contact
 Material of the housings: plastic, glass-fibre reinforced thermoplastic

Response time: ≤ 60 ms

Mechanical data

Design of electrical connection: Connector M12, 4-pole

Mechanical life: $\geq 1,000,000$ operations

Rated operating distance S_n : 6.5 mm

Ensured switch distance ON S_{a0} : 4 mm

Ensured switch distance OFF S_{ar} : 30 mm

Hysteresis: max. 1.5

Repeat accuracy R: < 0.5 mm

Resistance to shock: 30 g / 11 ms

Resistance to vibration: 10 ... 55 Hz, amplitude 1 mm

Max. actuating speed: ≤ 0.2 m/s

Latching force: 30 N

Tightening torque for cover screws: 0.7 Nm ... 1 Nm

Ambient conditions

Ambient temperature: -25 °C ... $+70$ °C

Storage and transport temperature: -25 °C ... $+85$ °C

Relative humidity: 30 % ... 95 %

- non-condensing

Protection class: IP67 to IEC/EN 60529

Protection rating: II \square

Electrical data - AS interface

AS-i Supply voltage: 26.5 ... 31.6 VDC, protection against polarity reversal

AS-i Operating current: ≤ 50 mA

AS-i Device insulation: internally short-circuit proof

AS-i Specification

- Version: V 2.1

- Profile: S-0.B.F.E

AS-i Inputs

- Channel 1: Data bits DI 0/DI 1= dynamic code transmission

- Channel 2: Data bits DI 2/DI 3= dynamic code transmission

AS-i Outputs

- DO 0 ... DO 3: not used

Technical data

AS-i Parameter bits

- P0: Door and actuator detected

- P1: Safety release

- P2: Static 0

- P3: Error

AS-i input module address: 0

- Default on address 0, programmable

via the AS-Interface Master or

Hand-held programming device

AS-i LED switching conditions display

(1) green/red LED (AS-i duo LED):

Supply voltage /

Communication error /

Slave address = 0

(2) red LED: Device error

(3) yellow LED: Device status

Dimensions

Dimensions: 40 mm x 220 mm x 50 mm

Classification

Standards: EN ISO 13849-1, IEC 61508,

IEC 60947-5-3

PL: up to e

Category: up to 4

PFH value: 4.0×10^{-9} /h

SIL: 3

Mission time: 20 years

Classification: PDF-M

Approvals



Ordering details

AZ 200 ST-T-AS

Actuators must be ordered separately. (refer to page: 32)

Note

Pin configuration

M12 connector

4-pole



PIN 1: AS-i +

PIN 2: spare (max. 30 VDC)

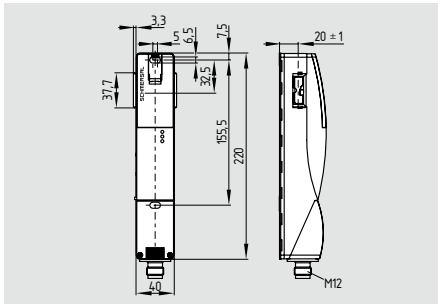
PIN 3: AS-i -

PIN 4: spare (max. 30 VDC)

Note

The addressing must take place via the M12 connector.

AZM 200 AS



- **Solenoid interlock** in 3 versions:
 - AZM 200 ST-T-AS:**
Release, when door is locked
 - AZM 200 B ST-T-AS:**
Release, when door is closed
 - AZM 200 BZ ST-T-AS:**
Release of AS-i split code 1, when door is closed
Release of AS-i split code 2, when door is locked
 - With integrated guard detection sensor
 - Integrated AS-Interface
 - AS-Interface LED and status display
 - AS-Interface magnet control
 - External magnet voltage supply
 - Sensor technology permits an offset between actuator and interlock of ± 5 mm
 - High holding force 2000 N
 - Intelligent diagnosis
 - Manual release
- **Suitable for applications:**
- up to PL e / category 4 to EN ISO 13849-1
 - up to SIL 3 to IEC/EN 61508

Approvals



Ordering details

AZM 200 ① ST-T-AS ②P

No.	Option	Description
①		Interlock monitored
	B	Actuator monitored
	BZ	Combined monitoring of the actuator/interlock
②		Power to unlock
	A	Power to lock

P = Magnet supply through auxiliary voltage

Actuators must be ordered separately.
(refer to page: 32)

Technical data

Standards: EN 50295, EN 60947-5-1, IEC 61508, EN ISO 13849-1, IEC 60947-5-3
 Active principle: electromechanical
 Duty cycle: magnet 100 %
 Material of the housings: plastic, glass-fibre reinforced thermoplastic, self-extinguishing
 Response time: < 60 ms

Mechanical data

Design of electrical connection: Connector M12, 4-pole
 Mechanical life: > 1,000,000 operations
 Resistance to shock: 30 g / 11 ms
 Resistance to vibration: 10 ... 150 Hz, amplitude 0.35 mm
 Max. actuating speed: 2 m/s
 Latching force: 30 N
 Holding force F_{max} : 2000 N
 Tightening torque for cover screws: 0.7 Nm ... 1 Nm

Ambient conditions

Ambient temperature: -25 °C ... $+60$ °C
 Storage and transport temperature: -25 °C ... $+85$ °C
 Relative humidity: 30 % ... 95 %
 - non-condensing
 Protection class: IP67 to IEC/EN 60529
 Protection rating: II \square

Electrical data - AS interface

AS-i Supply voltage: 26.5 ... 31.6 VDC, protection against polarity reversal
 AS-i Operating current: 100 mA
 AS-i Device insulation: internally short-circuit proof

AS-i Specification

- Version: V 2.1
 - Profile: S-7.B.F.E
 AS-i Inputs
 - Channel 1: Data bits DI 0/DI 1= dynamic code transmission
 - Channel 2: Data bits DI 2/DI 3= dynamic code transmission

AS-i Outputs

- DO 0: Solenoid control
 - DO 1 ... DO 3: not used

Technical data

AS-i Parameter bits

- P0: Door and actuator detected
 - P1: Door locked
 - P2: Solenoid voltage within tolerance range
 - P3: Error
 AS-i input module address: 0
 - Default on address 0, programmable via the AS-Interface Master or Hand-held programming device

Electrical data - Auxiliary voltage (Aux)

Supply voltage U_B : 24 VDC
 (-15 % / +10 %)
 (stabilised PELV)
 Operating current: 500 mA
 Device insulation: 4 A (if used in accordance with UL 508)

AS-i LED switching conditions display

(1) green/red LED (AS-i duo LED):
 Supply voltage /
 Communication error /
 Slave address = 0
 (2) red LED: Device error
 (3) yellow LED: Device status

Dimensions

Dimensions: 40 mm x 244 mm x 50 mm

Classification

Standards: EN ISO 13849-1, IEC 61508, IEC 60947-5-3
 PL: up to e
 Category: 4
 PFH value: 4×10^{-9} /h
 SIL: up to 3
 Mission time: 20 years
 Classification: PDF-M

Note

Pin configuration

M12 connector

4-pole

 PIN 1: AS-i +
 PIN 2: Aux - (P)
 PIN 3: AS-i -
 PIN 4: Aux + (P)

Interlocks with power to lock principle may only be used in special cases after a thorough evaluation of the accident risk, since the guarding device can immediately be opened on failure of the electrical power supply or when the main switch is opened.

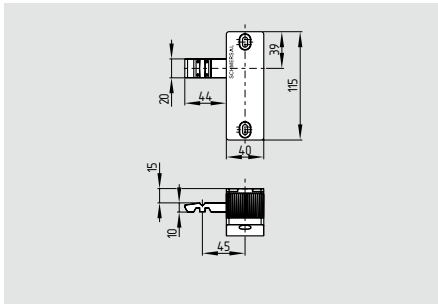
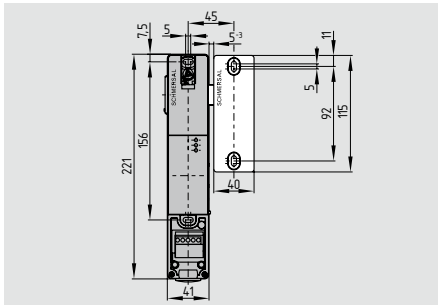
Note

The addressing must take place via the M12 connector.

AZ/AZM 200-B1-...

Technical data

System components



Material:

B1-housing:

Grivory
zinc die-cast

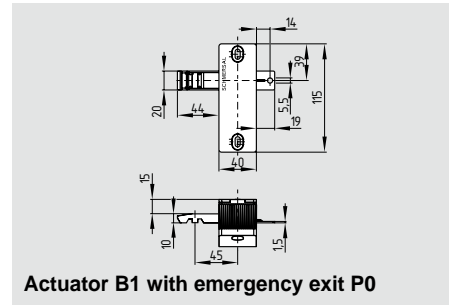
Actuator:

Mechanical life:

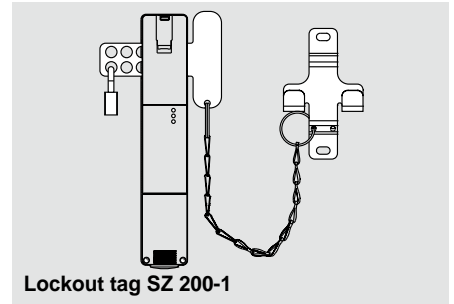
≥ 1 million operations

F_{max} AZM 200:

2000 N



Actuator B1 with emergency exit P0



Lockout tag SZ 200-1

• Actuator for sliding guards

- Actuator with return spring
- Tolerates overtravel of up to max. 5 mm
- With door detection sensor T
- Available with or without emergency exit (P0)

Approvals

Approvals only in combination with switches AZ/AZM 200



Ordering details

AZ/AZM 200-B1-①T②

No.	Option	Description
①	L	Actuating direction left
	R	Actuating direction right
②		Without emergency exit
	P0	With emergency exit

Note

The safety switches/solenoid interlocks and the actuator unit must be ordered separately!

Ordering details

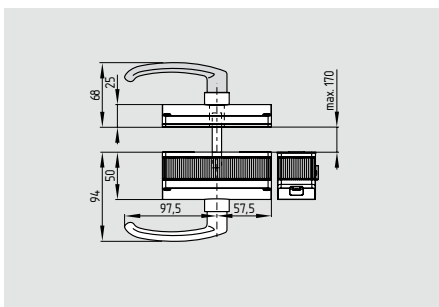
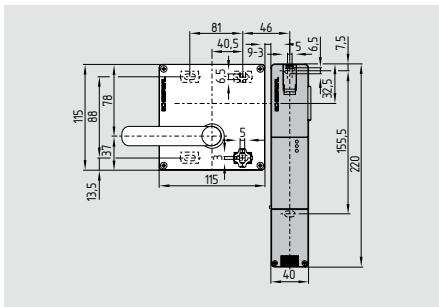
Actuator B1 with emergency exit

AZ/AZM 200-B1-...-P0

Lockout tag

SZ 200-1

AZ/AZM 200-B30-...



- **Actuator for hinged guards**
- One-hand emergency exit, even in de-energised condition
- With door detection sensor T
- Easy and intuitive operation
- NO risk of injury from protruding actuator
- No supplementary door handles required
- Does not protrude into the door opening
- Various handles available
- Can be fitted with or without emergency exit

Approvals



Approvals only in combination with switches AZ/AZM 200

Ordering details

AZ/AZM 200-B30-①TA-②-③④

No.	Option	Description
①	L	Door hinge on left-hand side
	R	Door hinge on right-hand side
②		Without lockout tag
③	SZ	With lockout tag
	G1	With door handle
	G2	With rotary button
④	P1	With emergency exit
	P20	With emergency exit metal
	P25	With emergency exit with inset handle

Technical data

Material:

Actuator unit B30:
glass-fibre reinforced thermoplastic, self-extinguishing, fixing holes with metal washer

Emergency exit P1:
glass-fibre reinforced thermoplastic, self-extinguishing, fixing holes with metal washer

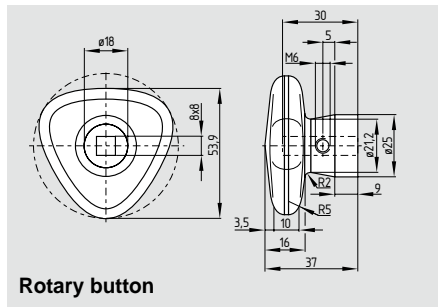
Door handle G1, G2:
plastic coated aluminium

Panic handle P1, P20, P25:
plastic coated aluminium

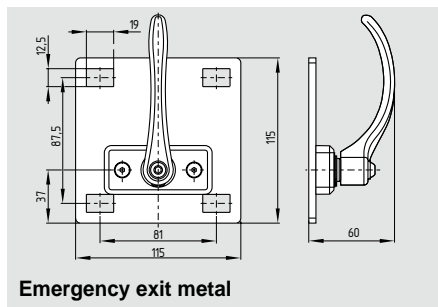
Actuator:
zinc die-cast

Mechanical life: ≥ 1 million operations
F_{max} AZM 200: 2000 N

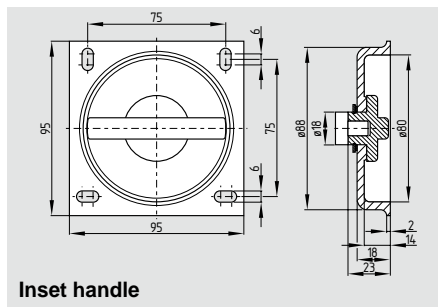
System components



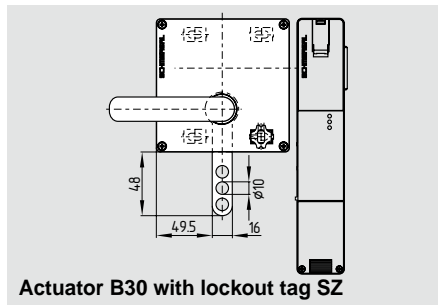
Rotary button



Emergency exit metal



Inset handle



Actuator B30 with lockout tag SZ

Note

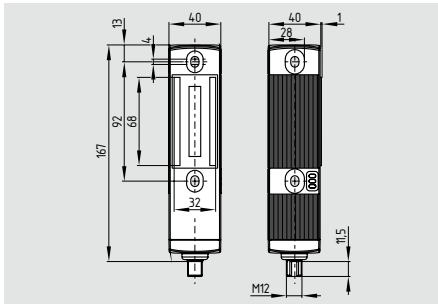
The safety switches/solenoid interlocks and the actuator unit must be ordered separately!

The actuator can be combined with a three-point locking rod to increase the stability of large and especially double-leaf safety guards.

Ordering details

- Actuator with rotary button **AZ/AZM 200-...-G2**
- Emergency exit metal with inset handle **AZ/AZM 200-...-P20**
AZ/AZM 200-...-P25
- Actuator B30 with lockout tag SZ** **AZ/AZM 200-B30-.-SZ**

MZM 100 AS



- **Safety switchgear** in 2 variants
MZM 100 ST-AS ...: Solenoid interlock
MZM 100 B ST-AS ...: Safety switch with supplementary guard locking function
- Sensor technology permits an offset between actuator and interlock of ± 5 mm vertically and ± 3 mm horizontally
- Power-to-lock principle
- Holding force 500 N
- Adjustable latching force 30 N ... 100 N
- Option: permanent magnet approx. 30 N
- Integrated AS-Interface
- AS-Interface LED and status display
- AS-Interface M12 connector
- AS-Interface magnet control
- External magnet voltage supply
- Intelligent diagnosis functions
- Protection class IP67
- Easy to clean
- **Suitable for applications:**
 - up to PL e/category 4 to EN ISO 13849-1
 - up to SIL 3 to IEC 61508

Approvals



Ordering details

MZM 100 ① ST-AS ②③ AP

No.	Option	Description
①		Interlock monitored
	B	Actuator monitored
②		Without latching (only for variant "interlock monitored")
	RE	Latching force variable approx. 30 N ... 100 N
③		Without permanent magnet
	M	With permanent magnet approx. 30 N

A = Power to lock
P = Supply through auxiliary voltage

Actuators must be ordered separately.

Technical data

Standards: EN 60947-5-1, IEC 61508, EN 50295, IEC 60947-5-3, EN ISO 13849-1
 Active principle: inductive
 Duty cycle: magnet 100 %
 Material of the housings: plastic, glass-fibre reinforced thermoplastic
 Recommended actuator: MZM 100-B1.1
 Response time: < 100 ms

Mechanical data

Design of electrical connection: Connector M12, 4-pole
 Mechanical life: 1,000,000 operations
 - Notice: operations for guards 5 kg; actuating speed 0.5 m/s

Resistance to shock: 30 g / 11 ms
 Resistance to vibration: 10 ... 150 Hz, amplitude 0.35 mm
 Latching force variable: 30 N ... 100 N
 Permanent magnet (M): 30 N
 Holding force F_{max} : 500 N

Ambient conditions

Ambient temperature: -25 °C ... $+55$ °C
 Storage and transport temperature: -25 °C ... $+85$ °C
 Relative humidity: 30 %... 95 %
 - non-condensing
 - non-icing
 Protection class: IP67 to IEC/EN 60529
 Protection rating: II, \square

Electrical data - AS interface

AS-i Supply voltage: 26.5 ... 31.6 VDC, protection against polarity reversal
 AS-i Operating current: 100 mA
 AS-i Device insulation: internally short-circuit proof

AS-i Specification

- Version: V 2.1
 - Profile: S-7.B.F.E
 AS-i Inputs
 - Channel 1: Data bits DI 0/DI 1= dynamic code transmission
 - Channel 2: Data bits DI 2/DI 3= dynamic code transmission

Technical data

AS-i Outputs

- DO 0: Solenoid control
 - DO 1: for the variable setting of latching
 - DO 2: for the variable setting of latching
 - DO 3: for the variable setting of latching

AS-i Parameter bits

- P0: Actuator present
 - P1: Door locked
 - P2: Auxiliary voltage on
 - P3: Device error (Error detected)

AS-i input module address:

0
 - Default on address 0, programmable via the AS-Interface Master or Hand-held programming device

Electrical data - Auxiliary voltage (Aux)

Supply voltage U_B : 24 VDC (-15 % / $+10$ %) (stabilised PELV)
 Operating current: 600 mA
 Device insulation: 4 A (if used in accordance with UL 508)

AS-i LED switching conditions display

(1) green/red LED (AS-i duo LED):
 Supply voltage / Communication error / Slave address = 0
 Device status
 Device error
 (2) yellow LED:
 (3) red LED:

Dimensions

Dimensions: 40 mm x 179 mm x 40 mm

Classification

Standards: EN ISO 13849-1, IEC 61508, IEC 60947-5-3
 PL: up to e
 Category: up to 4
 PFH value: 5×10^{-9} /h
 SIL: up to 3
 Mission time: 20 years
 Classification: PDF-M

Note

Pin configuration

M12 connector

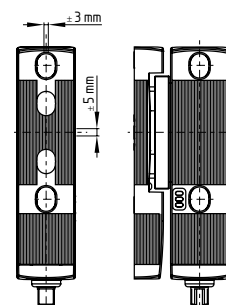
4-pole

 PIN 1: AS-i +
 PIN 2: Aux - (P)
 PIN 3: AS-i -
 PIN 4: Aux + (P)

Interlocks with power to lock principle may only be used in special cases after a thorough evaluation of the accident risk, since the guarding device can immediately be opened on failure of the electrical power supply or when the main switch is opened.

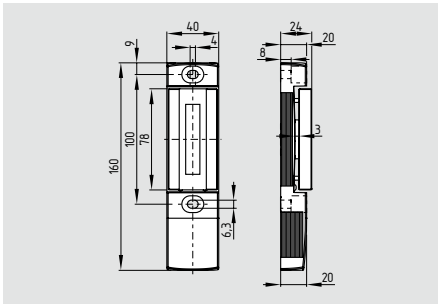
Note

The addressing must take place via the M12 connector.



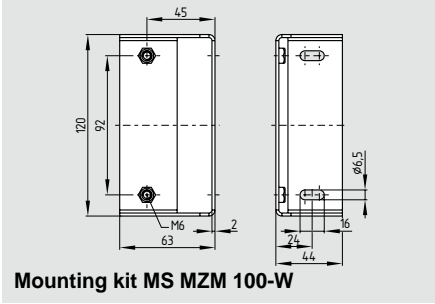
Misalignment

Actuator MZM 100-B1.1



- Actuator free from play, i.e. neutralisation of undesired noises
- Sensor technology permits an offset between actuator and interlock of ± 5 mm vertically and ± 3 mm horizontally

System components



Mounting kit MS MZM 100-W

Approvals

Approvals only in combination with switches MZM 100 AS



Ordering details

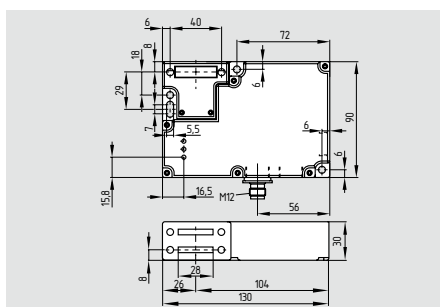
MZM 100-B1.1

Ordering details

Mounting kit
(screws included in delivery)

MS MZM 100-W

AZM 161 AS



- **Solenoid interlock** in 3 versions:
 - AZM 161 Z ST.-AS:**
Release, when door is locked
 - AZM 161 B ST.-AS:**
Release, when door is closed
 - AZM 161 BZ ST.-AS:**
AS-i semi-code 2, when safety guard closed
AS-i semi-code 1, when safety guard locked
- High holding force 2000 N
- Integrated AS-I interface
- AS-Interface LED and status display
- AS-Interface M12 connector
- AS-Interface magnet control
- Solenoid power supply via the AS-Interface network or via an external 24 VDC power supply (P version)
- Intelligent diagnosis
- Manual release, emergency exit or emergency release
- Protection class IP67

Approvals



Ordering details

AZM 161 ① ②-AS③④⑤⑥

No.	Option	Description
①	Z	Interlock monitored
	B	Actuator monitored
	BZ	Combined monitoring of the actuator/interlock
②	ST1	Connector bottom
	ST2	Connector right
③		Latching force 5 N
	R	Latching force 30 N
④		Power to unlock
	A	Power to lock
⑤		Solenoid supply from AS-i
	P	Solenoid supply 24 VDC (Aux)

Technical data

Standards: EN 50295, EN 60947-5-1, IEC 61508, EN ISO 13849-1
 Duty cycle: magnet 100 %
 Material of the housings: plastic, glass-fibre reinforced thermoplastic, self-extinguishing

Response time: < 100 ms

Mechanical data

Design of electrical connection: Connector M12, 4-pole

Mechanical life: > 1,000,000 operations

Resistance to shock: 30 g / 11 ms

Resistance to vibration: 10 ... 150 Hz, amplitude 0.35 mm

Latching force (R): 30 N

Holding force F_{max} : 2000 N

Max. actuating speed: ≤ 2 m/s

Ambient conditions

Ambient temperature: $-25^{\circ}\text{C} \dots +60^{\circ}\text{C}$

Storage and transport temperature: $-25^{\circ}\text{C} \dots +85^{\circ}\text{C}$

Relative humidity: 30 % ... 95 %

- non-condensing, non-icing

Protection class: IP67 to IEC/EN 60529

Protection rating: II \square

Electrical data - AS interface

AS-i Supply voltage: 26.5 ... 31.6 VDC, protection against polarity reversal

AS-i Operating current: max. 250 mA

P version: max. 100 mA

AS-i Device insulation: internally short-circuit proof

AS-i Specification

- Version: V 2.1

- Profile: S-7.B.F.E

AS-i Inputs

- Channel 1: Data bits DI 0/DI 1= dynamic code transmission

- Channel 2: Data bits DI 2/DI 3= dynamic code transmission

AS-i Outputs

- DO 0: Solenoid control

- DO 1 ... DO 3: not used

Technical data

AS-i Parameter bits

- P0: Actuator detected

- P1: Door locked

- P2: Solenoid voltage within tolerance range

- P3: Error - locking/unlocking of the solenoid interlock blocked

AS-i input module address: 0

- Default on address 0, programmable via the AS-Interface Master or Hand-held programming device

Electrical data - Auxiliary voltage (Aux)

(P version):

Supply voltage U_B : 24 VDC ($-15\% / +10\%$) (stabilised PELV)

Operating current: ≤ 500 mA

Device insulation: ≤ 4 A (if used in accordance with UL 508)

AS-i LED switching conditions display

(1) yellow LED: Channel 2 / AS-i SaW Bit 2.3

(2) green/red LED (AS-i duo LED): Supply voltage / Communication error / Slave address = 0 or periphery error

(3) yellow LED: Channel 1 / AS-i SaW Bit 0.1

Dimensions

Dimensions: 130 mm x 90 mm x 30 mm

Classification

If a fault exclusion for hazardous damage of the 1-channel mechanics is authorized and an adequate protection against tampering is ensured, suitable for use up to:

Standards: EN ISO 13849-1, IEC 61508

PL: up to d

Category: 3

PFH Wert: $1.01 \times 10^{-7}/\text{h}$

- Notice: up to max. 100,000 switching cycles/year

SIL: up to 2

Mission time: 20 years

Basically suitable up to

Standards: EN ISO 13849-1, IEC 61508

PL: up to c

Category: 1

PFH value: $1.14 \times 10^{-6}/\text{h}$

- Notice: up to max. 100,000 switching cycles/year

SIL: up to 1

Mission time: 20 years

AS-Interface Safety at Work

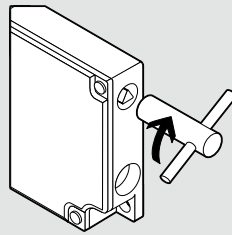
Diagnosis

Diagnostic function: Locking/unlocking of the solenoid interlock blocked:

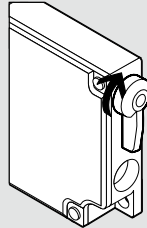
This error is detected, when the solenoid interlock can no longer be correctly locked or unlocked, for instance due to an incorrectly closed safety guard, a tilted actuator or an incorrect reset manual release.

The error is transmitted as "peripheral error" to the control system through the AS-i Master and indicated by the alternate flashing of the red/green AS-i duo-LED on the device.

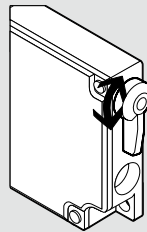
System components



Manual release



Emergency release



Emergency exit

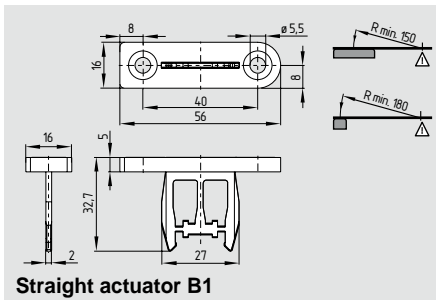
Note

Interlocks with power to lock principle may only be used in special cases after a thorough evaluation of the accident risk, since the guarding device can immediately be opened on failure of the electrical power supply or when the main switch is opened.

Ordering details

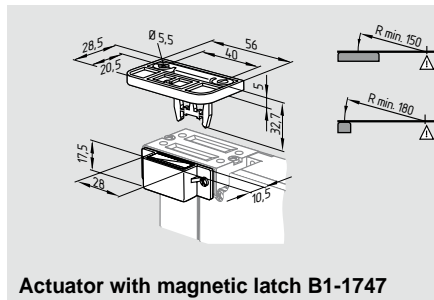
Manual release	(none)
Emergency release	N
Emergency exit	T

System components



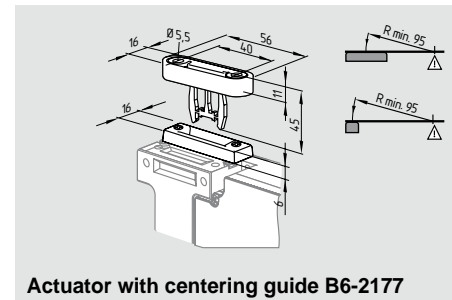
Straight actuator B1

System components

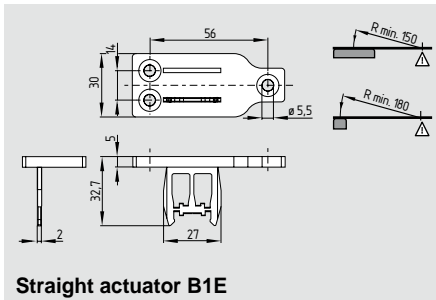


Actuator with magnetic latch B1-1747

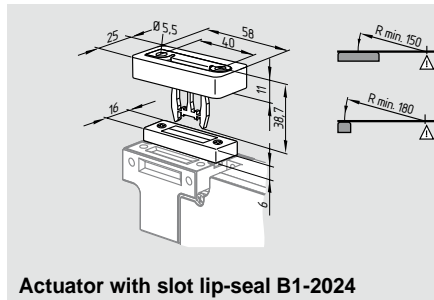
System components



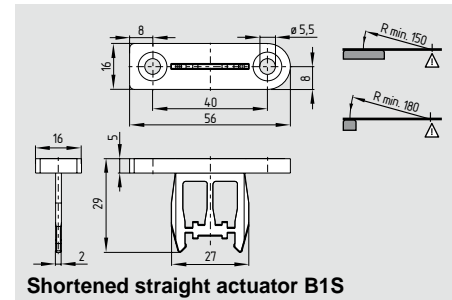
Actuator with centering guide B6-2177



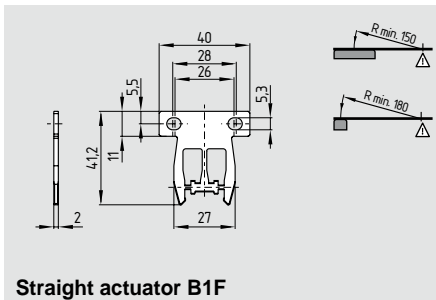
Straight actuator B1E



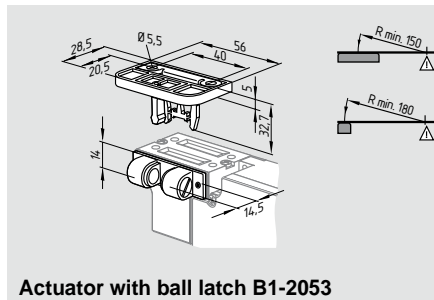
Actuator with slot lip-seal B1-2024



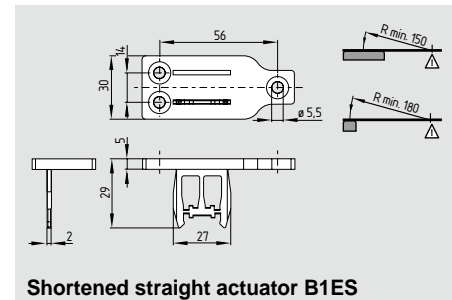
Shortened straight actuator B1S



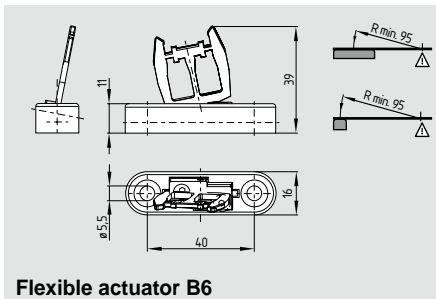
Straight actuator B1F



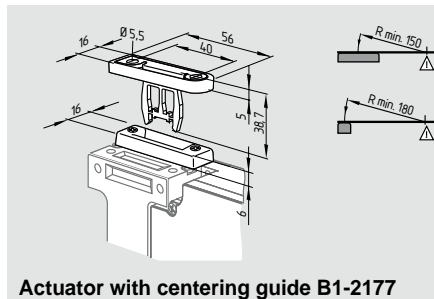
Actuator with ball latch B1-2053



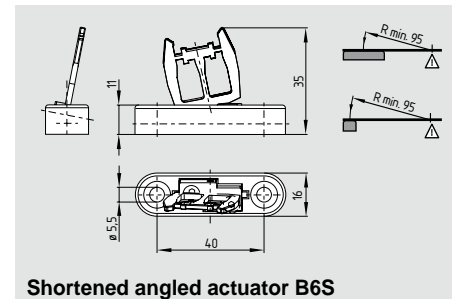
Shortened straight actuator B1ES



Flexible actuator B6



Actuator with centering guide B1-2177



Shortened angled actuator B6S

Ordering details

Straight actuator
Straight actuator
Straight actuator
Flexible actuator

AZM 161-B1
AZM 161-B1E
AZM 161-B1F
AZM 161-B6

Straight actuator
with magnetic latch
with slot lip-seal
with ball latch
with centering guide

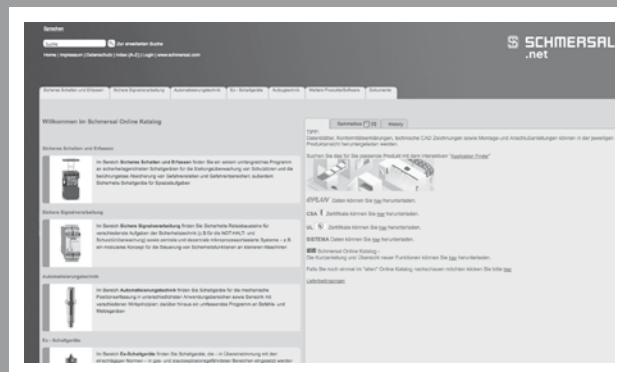
AZM 161-B1-1747
AZM 161-B1-2024
AZM 161-B1-2053
AZM 161-B1-2177

Ordering details

Flexible actuator
with centering guide
Shortened straight actuator
Shortened straight actuator
Shortened angled actuator

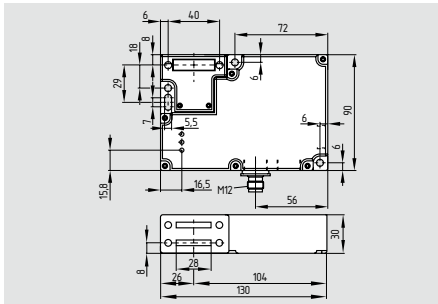
AZM 161-B6-2177
AZM 161-B1S
AZM 161-B1ES
AZM 161-B6S

Up-to-date without fail. The online product catalogue



For detailed information, check out
www.schmersal.net

AZM 161 AS I



- **With individual coding, up to 200 combinations**
- Solenoid interlock in 3 versions:
 - AZM 161 Z ST.-AS I:** Release, when door is locked
 - AZM 161 B ST.-AS I:** Release, when door is closed
 - AZM 161 BZ ST.-AS I:** AS-i semi-code 2, when safety guard closed
AS-i semi-code 1, when safety guard locked
- High holding force 2000 N
- Integrated AS-I interface
- AS-Interface LED and status display
- AS-Interface M12 connector
- AS-Interface magnet control
- Solenoid power supply via the AS-Interface network or via an external 24 VDC power supply (P version)
- Intelligent diagnosis
- Manual release, emergency exit or emergency release
- Protection class IP67

Approvals



Ordering details

AZM 161 ① ②-AS③④⑤⑥-⑦

No.	Option	Description
①	Z	Interlock monitored
	B	Actuator monitored
	BZ	Combined monitoring of the actuator/interlock
②	ST1	Connector bottom
	ST2	Connector right
③		Latching force 5 N
	R	Latching force 30 N
④		Power to unlock
	A	Power to lock
⑤		Solenoid supply from AS-i
	P	Solenoid supply 24 VDC (Aux)

Technical data

Standards: EN 50295, EN 60947-5-1, IEC 61508, EN ISO 13849-1
 Duty cycle: magnet 100 %
 Material of the housings: plastic, glass-fibre reinforced thermoplastic, self-extinguishing

Response time: < 100 ms

Mechanical data

Design of electrical connection: Connector M12, 4-pole

Mechanical life: > 1,000,000 operations

Resistance to shock: 30 g / 11 ms

Resistance to vibration: 10 ... 150 Hz, amplitude 0.35 mm

Latching force (R): 30 N

Holding force F_{max} : 2000 N

Max. actuating speed: ≤ 2 m/s

Ambient conditions

Ambient temperature: $-25^{\circ}\text{C} \dots +60^{\circ}\text{C}$

Storage and transport temperature: $-25^{\circ}\text{C} \dots +85^{\circ}\text{C}$

Relative humidity: 30 % ... 95 %

- non-condensing, non-icing

Protection class: IP67 to IEC/EN 60529

Protection rating: II \square

Electrical data - AS interface

AS-i Supply voltage: 26.5 ... 31.6 VDC, protection against polarity reversal

AS-i Operating current: max. 250 mA
 P version: max. 100 mA

AS-i Device insulation: internally short-circuit proof

AS-i Specification

- Version: V 2.1

- Profile: S-7.B.F.E

AS-i Inputs

- Channel 1: Data bits DI 0/DI 1= dynamic code transmission

- Channel 2: Data bits DI 2/DI 3= dynamic code transmission

AS-i Outputs

- DO 0: Solenoid control

- DO 1 ... DO 3: not used

Technical data

AS-i Parameter bits

- P0: Actuator detected

- P1: Door locked

- P2: Solenoid voltage within tolerance range

- P3: Error - locking/unlocking of the solenoid interlock blocked

AS-i input module address: 0

- Default on address 0, programmable

via the AS-Interface Master or

Hand-held programming device

Electrical data - Auxiliary voltage (Aux)

(P version):

Supply voltage U_B : 24 VDC ($-15\% / +10\%$) (stabilised PELV)

Operating current: ≤ 500 mA

Device insulation: ≤ 4 A (if used in accordance with UL 508)

AS-i LED switching conditions display

(1) yellow LED: Channel 2 / AS-i SaW Bit 2.3

(2) green/red LED (AS-i duo LED): Supply voltage / Communication error / Slave address = 0 or periphery error

(3) yellow LED: Channel 1 / AS-i SaW Bit 0.1

Dimensions

Dimensions: 130 mm x 90 mm x 30 mm

Classification

If a fault exclusion for hazardous damage of the 1-channel mechanics is authorized and an adequate protection against tampering is ensured, suitable for use up to:

Standards: EN ISO 13849-1, IEC 61508

PL: up to d

Category: 3

PFH Wert: $1.01 \times 10^{-7}/\text{h}$

- Notice: up to max. 100,000 switching cycles/year

SIL: up to 2

Mission time: 20 years

Basically suitable up to

Standards: EN ISO 13849-1, IEC 61508

PL: up to c

Category: 1

PFH value: $1.14 \times 10^{-6}/\text{h}$

- Notice: up to max. 100,000 switching cycles/year

SIL: up to 1

Mission time: 20 years

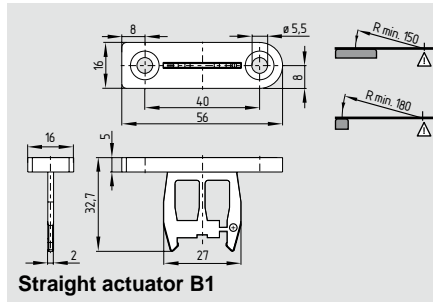
Diagnosis

Diagnostic function: Locking/unlocking of the solenoid interlock blocked:

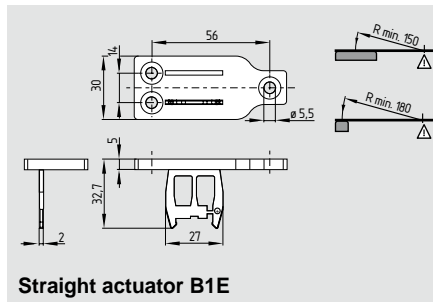
This error is detected, when the solenoid interlock can no longer be correctly locked or unlocked, for instance due to an incorrectly closed safety guard, a tilted actuator or an incorrect reset manual release.

The error is transmitted as "peripheral error" to the control system through the AS-i Master and indicated by the alternate flashing of the red/green AS-i duo-LED on the device.

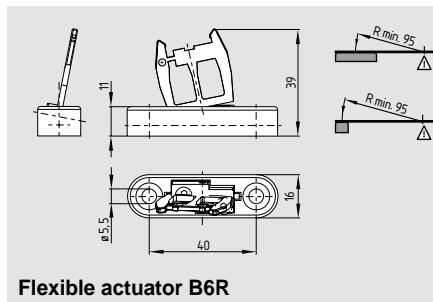
System components



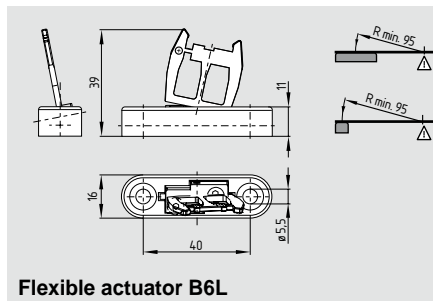
Straight actuator B1



Straight actuator B1E

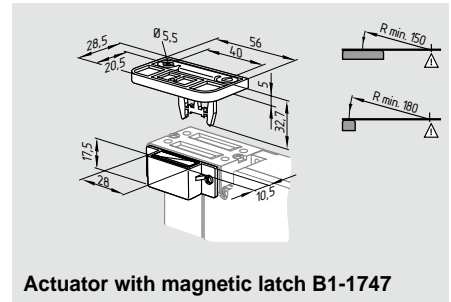


Flexible actuator B6R

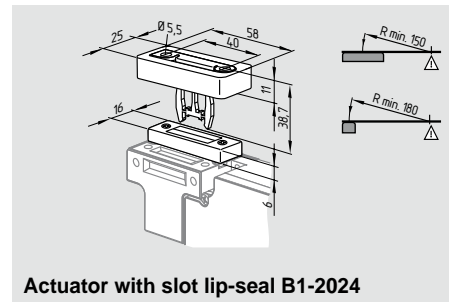


Flexible actuator B6L

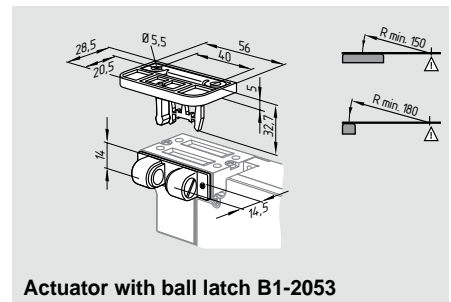
System components



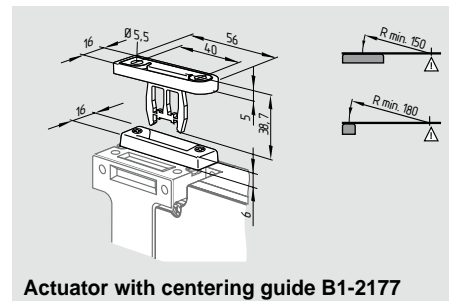
Actuator with magnetic latch B1-1747



Actuator with slot lip-seal B1-2024



Actuator with ball latch B1-2053



Actuator with centering guide B1-2177

Note

Interlocks with power to lock principle may only be used in special cases after a thorough evaluation of the accident risk, since the guarding device can immediately be opened on failure of the electrical power supply or when the main switch is opened.

Ordering details

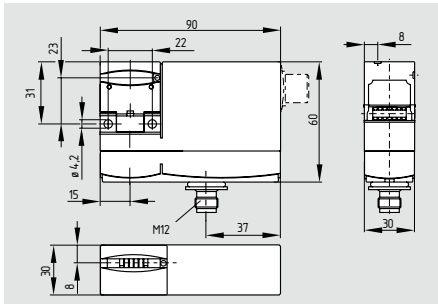
Straight actuator
Straight actuator
Flexible actuator right
Flexible actuator left

B1 Straight actuator
B1E with magnetic latch
B6R with slot lip-seal
B6L with ball latch
with centering guide

B1-1747
B1-2024
B1-2053
B1-2177

Ordering details

AZM 170 AS



- **Solenoid interlock** with 2 variants
AZM 170 B ST-AS: Enabling signal, only when safety guard closed
AZM 170 BZ ST-AS: AS-i semi-code 2, when safety guard closed AS-i semi-code 1, when safety guard locked
- High holding force 1000 N
- Integrated AS-I interface
- AS-Interface LED status display
- AS-Interface M12 connector
- AS-Interface magnet control
- Magnet voltage supply through 24 VDC auxiliary voltage
- Manual release for power to unlock
- Protection class IP67

Technical data

Standards: EN 50295, EN 60947-5-1, IEC 61508, EN ISO 13849-1
 Duty cycle: magnet 100 %
 Material of the housings: glass-fibre reinforced thermoplastic, self-extinguishing
 Response time: < 100 ms

Mechanical data

Design of electrical connection: Connector M12, 4-pole
 Mechanical life: > 1,000,000 operations
 Latching force: 30 N
 Clamping force F_{max} : 1000 N
 Max. actuating speed: ≤ 2 m/s

Ambient conditions

Ambient temperature: $-25^{\circ}\text{C} \dots +55^{\circ}\text{C}$
 Storage and transport temperature: $-25^{\circ}\text{C} \dots +85^{\circ}\text{C}$
 Relative humidity: 30 % ... 95 %
 - non-condensing
 - non-icing

Protection class: IP67 to IEC/EN 60529
 Protection rating: II \square

Electrical data - AS interface

AS-i Supply voltage: 26.5 ... 31.6 VDC, protection against polarity reversal
 AS-i Operating current: ≤ 50 mA
 AS-i Device insulation: internally short-circuit proof

AS-i Specification
 - Version: V 2.1
 - Profile: S-7.B.F.E

AS-i Inputs
 - Channel 1: Data bits DI 0/DI 1= dynamic code transmission
 - Channel 2: Data bits DI 2/DI 3= dynamic code transmission

AS-i Outputs
 - DO 0: Solenoid control
 - DO 1 ... DO 3: not used

Technical data

AS-i Parameter bits
 - P0: Safety guard and actuator detected
 - P1: Solenoid interlock blocked
 - P2 ... P3: not used
 AS-i input module address: 0
 - Default on address 0, programmable via the AS-Interface Master or Hand-held programming device

Electrical data - Auxiliary voltage (Aux)

Supply voltage U_B : 24 VDC (-15% / $+10\%$) (stabilised PELV)
 Operating current: ≤ 500 mA
 Device insulation: ≤ 4 A (if used in accordance with UL 508)

AS-i LED switching conditions display

(1) green LED: Supply voltage
 (2) red LED: Communication error / Slave address = 0
 (3) yellow LED: Enabling status

Dimensions

Dimensions: 90 mm x 75.5 mm

Classification

If a fault exclusion for hazardous damage of the 1-channel mechanics is authorized and an adequate protection against tampering is ensured, suitable for use up to:

Standards: EN ISO 13849-1, IEC 61508
 PL: up to d
 Category: 3
 PFH value: $1.01 \times 10^{-7}/\text{h}$
 - Notice: up to max. 100,000 switching cycles/year
 SIL: up to 2
 Mission time: 20 years

Basically suitable up to

Standards: EN ISO 13849-1, IEC 61508
 PL: up to c
 Category: 1
 PFH value: $1.16 \times 10^{-6}/\text{h}$
 - Notice: up to max. 100,000 switching cycles/year
 SIL: up to 1
 Mission time: 20 years

Approvals



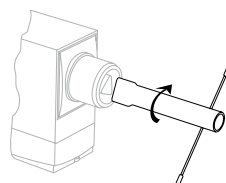
Ordering details

AZM 170 ① ST-AS ②③P④

No.	Option	Description
①	B BZ	Actuator monitored Combined actuator/solenoid interlock monitoring
②	R	Latching force 5 N Latching force 30 N
③	A	Power to unlock Power to lock
④	2197	Manual release for power to unlock

Actuators must be ordered separately.

Note



Manual release from side

- For manual release using M5 triangular key, available as accessory
- Manual release available for power to unlock principle
- Ordering suffix -2197

Note

Pin configuration

M12 connector

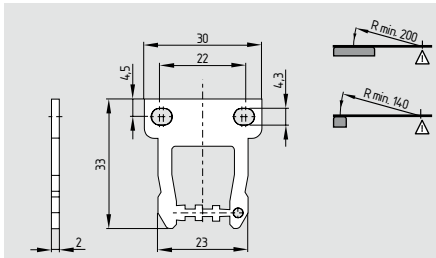
4-pole

 PIN 1: AS-i +
 PIN 2: Aux - (P)
 PIN 3: AS-i -
 PIN 4: Aux + (P)

The addressing must take place via the M12 connector.

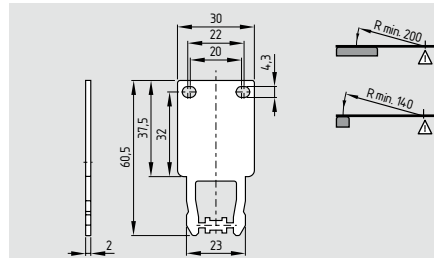
Interlocks with power to lock principle may only be used in special cases after a thorough evaluation of the accident risk, since the guarding device can immediately be opened on failure of the electrical power supply or when the main switch is opened.

System components



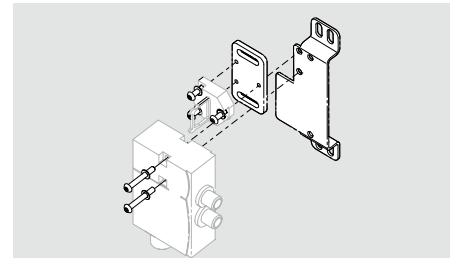
Straight actuator AZ 17/170-B1

System components

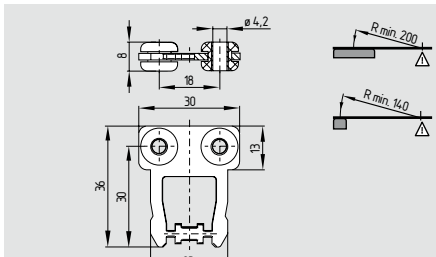


Long straight actuator AZ 17/170-B11

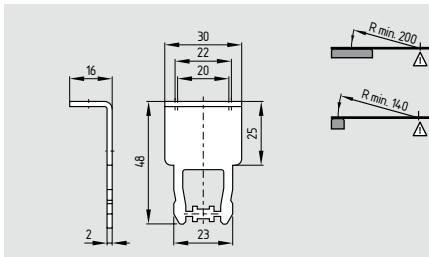
System components



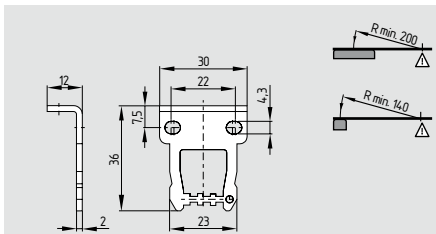
Mounting set MS AZM 170



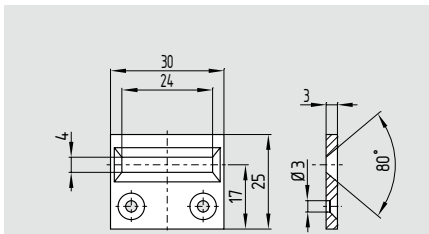
AZ 17/170-B1-2245 with rubber mounting



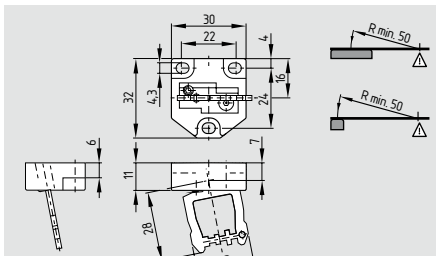
Long angled actuator AZ 17/170-B15



Angled actuator AZ 17/170-B5



Centering guide AZM 170-B



Flexible actuator AZM 170-B6

Ordering details

Straight actuator with rubber mounting
Angled actuator
Flexible actuator

AZ 17/170-B1
AZ 17/170-B1-2245
AZ 17/170-B5
AZM 170-B6

Ordering details

Long straight actuator
Long angled actuator
Centering guide

AZ 17/170-B11
AZ 17/170-B15
AZM 170-B

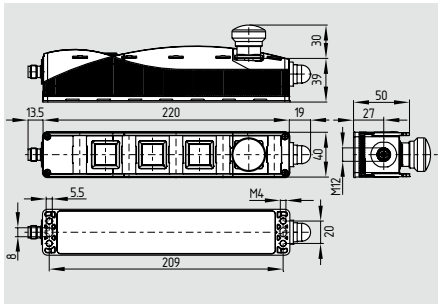
Ordering details

Mounting sets
Tamperproof screws with unidirectional slots (without drawing)
M4 x 8
(Quantity 2 pcs)

MS AZM 170 P
MS AZM 170 R/P

1147463

BDF 200 AS



- **Control panel with emergency stop function**
- Slim, shock-resistant plastic enclosure
- Can be fitted onto customary aluminium profile systems
- Comprehensive selection of illuminated pushbuttons, selector switches, signalling devices with LED, key-operated switches and emergency stop switches/pushbuttons
- Emergency stop, start/stop and reset functions available
- Two-layer plastic identification labels can be used (engravements on request)
- Integrated AS-I interface
Safety Slave for emergency stop and A/B Slave for command and signalling devices
- AS-Interface M12 connector optionally at the bottom or on top
- Suitable for AS-i Power24
- Protection class IP65

Technical data

Standards: EN 60947-5-1, EN ISO 13850, EN ISO 13849-1, IEC 61508, EN 50295
 Enclosure material: glass-fibre reinforced thermoplastic, self-extinguishing
 Mechanical life:
 - Emergency stop: 100,000 operations
 - Command device: 1 million operations
 Response time - Emergency stop: < 100 ms
 Design of electrical connection: Connector M12

Lamp values illuminated pushbutton:

Lamp fitting: Ba5S, only LED, length 17 mm
 LED replacement: from front

Electrical data - AS interface

AS-i Supply voltage: 18.0 ... 31.6 VDC, protection against polarity reversal
 AS-i Operating current: ≤ 150 mA
 AS-i Device insulation: internally short-circuit proof

AS-i specification

- Version: V 3.0
 - Profile: S-7.B.F.F

AS-i Inputs

- Channel 1: Data bits DI 0/DI 1= dynamic code transmission
 - Channel 2: Data bits DI 2/DI 3= dynamic code transmission

AS-i Outputs

- DO 0: Indicator lamp G24 red
 - DO 1: Indicator lamp G24 green
 - DO 2 ... DO 3: not used

AS-i Parameter bits

- P0 ... P3: not used

AS-i specification

- Version: V 3.0
 - Profile: S-7.A.7.F

AS-i Inputs

- DI 0: Control element on position 4
 - DI 1: Control element on position 3
 - DI 2: Control element on position 2
 - DI 3: Control element on position 2

Technical data

AS-i Outputs

- DO 0: Signalling element on position 4
 - DO 1: Signalling element on position 3
 - DO 2: Signalling element on position 2
 - DO 3: not used

AS-i Parameter bits

- P0 ... P3: not used

AS-i input module address:

0

- Default on address 0, programmable via the AS-Interface Master or Hand-held programming device

Ambient conditions:

Ambient temperature: -25 °C ... +50 °C

Storage and transport

temperature: -25 °C ... +85 °C

Climatic resistance: to DIN EN 60068, Part 2 - 30

Protection class-Enclosure:

IP65

Protection rating:

II □

Resistance to vibration: 10 ... 150 Hz, amplitude 0.35 mm / 5 g

Resistance to shock: 15 g / 11 ms

Classification - Emergency stop function:

Standards: EN ISO 13849-1; IEC 61508

PL: up to e

Category: up to 4

PFH value: 1.4 x 10⁻⁸/h

- Notice: up to max. 5,000 switching cycles/year

SIL: up to 3

Mission time: 20 years

Approvals



Ordering details

BDF 200-①-AS-②-③-④-⑤-⑥

No.	Option	Description
①	ST1 ST2	Connector M12, bottom Connector M12, top (not for G24)
②	Pos. 1 NH NHK	Command devices Emergency stop latching pushbutton without protective collar with protective collar
③	Pos. 2 WS 2/3 WT. 2/3 SW. 20 LT.. LM.. DT..	Command and signalling devices Maintained selector switch, 2/3 positions Spring-return selector switch, 2/3 positions Key selector switch, 2 positions Illuminated pushbutton Signalling device Pushbutton

Ordering details

No.	Option	Description
④	Pos. 3 LT.. LM.. DT..	Command and signalling devices Illuminated pushbutton Signalling device Pushbutton
⑤	Pos. 4 LT.. LM.. DT..	Command and signalling devices Illuminated pushbutton Signalling device Pushbutton
⑥	G24	Without indicator lamp G24 With indicator lamp G24, top

Unused positions are labelled „B“ and are sealed with a blanking plug in factory.

Note

Pin configuration

M12 connector

4-pole

PIN 1: AS-i +
 PIN 2: spare
 PIN 3: AS-i -
 PIN 4: spare



The addressing must take place via the M12 connector.

Both AS-i slaves can be enabled and disabled through the integrated DIP switch.

Control elements		Pos. 1	Pos. 2	Pos. 3	Pos. 4	Control panel
	NH	●				
	NHK	●				
	LT..		●	●	●	
	LM..		●	●	●	
	DT..		●	●	●	
	SWS20 SWT20		●			
	WS20 WS30 WT20 WT30 WTS30		●			

Description of the control elements, as of page 46.

Note

Recommended types:

BDF 200 ST1-AS NHK-LMRD-LTWH-LTBU
Article number: 1215201

BDF 200 ST1-AS NHK-LMRD-LTWH-LTGN
Article number: 1215202

- Emergency stop latching pushbutton with protective collar
- Signalling device red for "emergency stop actuated"
- Illuminated pushbutton white for automatic stop
- Illuminated pushbutton blue/green for reset/start

Note

Recommended types:

BDF 200 ST1-AS NHK-LTWH-LTBU-LTWH
Article number: 1215203

BDF 200 ST1-AS NHK-LTWH-LTGN-LTWH
Article number: 1215204

- Emergency stop latching pushbutton with protective collar
- Illuminated pushbutton white for automatic stop
- Illuminated pushbutton blue/green for reset/start
- Illuminated pushbutton white for miscellaneous functions

Note

Recommended types:

BDF 200 ST1-AS NHK-SWS20-LTWH-LTBU-G24
Article number: 1214557

BDF 200 ST1-AS NHK-SWS20-LTWH-LTGN-G24
Article number: 1215205

- Emergency stop latching pushbutton with protective collar
- Key selector switch for authorisation to operate
- Illuminated pushbutton white for automatic stop
- Illuminated pushbutton blue/green for reset/start
- Indicator lamp G24 for "emergency stop actuated"

NH / NHK



- **Emergency stop latching pushbutton**
- Mushroom-shaped plastic pushbutton, Ø 30 mm
- Pull to reset
- 2 NC contacts on Safety Slave
- Without protective collar: ordering suffix **NH**
- With protective collar: ordering suffix **NHK**

LT..



- **Illuminated pushbutton**
- With concave button
- Contact surface 19 x 19 mm
- 1 NO contact on DI A/B Slave
- 1 LED on DO A/B Slave
- Lamp replacement from front
- Available in 5 different colours
- Prints on device on request
- Ordering suffix, refer to table below

LM..



- **Signalling device**
- With concave button
- Illuminated surface 19 x 19 mm
- 1 NO contact on DO A/B Slave
- Lamp replacement from front
- Available in 5 different colours
- Prints on device on request
- Ordering suffix, refer to table below

DT..



- **Pushbutton**
- With concave button
- Contact surface 19 x 19 mm
- 1 NO contact on DI A/B Slave
- Available in 6 different colours
- Prints on device on request
- Ordering suffix, refer to table below

Suffix	yellow	red	green	blue	black	white
 Illuminated pushbutton LT..	LTYE	LTRD	LTGN	LTBU		LTWH
 Signalling device LM..	LMYE	LMRD	LMGN	LMBU		LMWH
 Pushbutton DT..	DTYE	DTRD	DTGN	DTBU	DTBK	DTWH

W..0

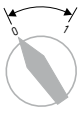
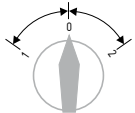

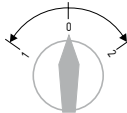
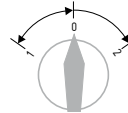




- **Selector switch / Spring-return selector switch**
- Version with standard knob, anthracite grey
- Ordering suffix, refer to table below

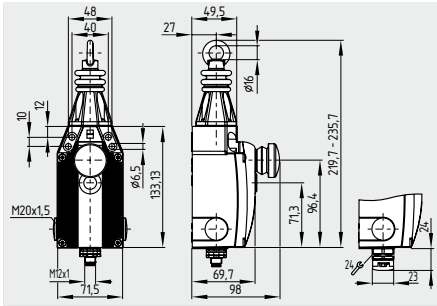
SW.20



- **Key-operated selector switch / Spring-return selector switch**
- Version with high-grade cylinder lock, therefore IP65 as well
- Ordering suffix, refer to table below

Ordering suffix	Selector switch	Selector switch	Spring-return	Spring-return	Selector switch
					
	1 latching position	2 latching positions left and right of the zero position	1 touch position and automatic return to the zero position	2 touch positions left and right of the zero position and automatic return to the zero position	1 touch position right and automatic return to the zero position + 1 latching position left of the zero position
	1 NO contact	1 NO contact for each switching position	1 NO contact	1 NO contact for each switching position	1 NO contact for each switching position
 Standard knob	WS20	WS30	WT20	WT30	WTS30
 Key-operated switch	SWS20		SWT20		

ZQ 900 AS



- Pull-wire Emergency-Stop switches to EN ISO 13850 / IEC 60947-5-5
- Metal enclosure
- Wire up to 50 m long
- Position indicator
- One tension force for wire lengths from 5 to 50 m
- Reset pushbutton
- Twisting of connection ring not possible
- External watertight collar
- Wire pull and breakage function
- Stainless
- Integrated AS-I interface
- AS-Interface M12 connector (turnable) or flat cable connection (turnable)
- Suitable for AS-i Power24
- Protection class IP67

Technical data

Standards: EN ISO 13850, EN 50295, IEC 61508, EN ISO 13849-1, EN 60947-5-1
 Material of the housings: zinc die-cast, enamel finish
 Material of the cover: plastic, glass-fibre reinforced thermoplastic, self-extinguishing
 Switching principle: snap action, NC contacts with positive break ⊖
 Response time: < 100 ms

Mechanical data

Execution of the electrical connection: connector M12, 5-pole, or flat cable connection
 Mechanical life: > 100,000 operations
 Switching frequency: max. 1/s
 Actuating force: max. 200 N
 Actuating travel: max. 400 mm
 Resistance to shock: 15 g / 11 ms
 Resistance to vibration: 10 ... 150 Hz, amplitude 0.35 mm / 5 g max. 50 m
 Length of wire: max. 50 m

Ambient conditions

Ambient temperature: -25 °C ... +60 °C
 Storage and transport temperature: -25 °C ... +85 °C
 Relative humidity: 30 %... 95 %
 - non-condensing
 - non-icing
 Protection class: IP65, IP67

Electrical data - AS interface

AS-i Supply voltage: 18.0 ... 31.6 VDC, protection against polarity reversal
 AS-i Operating current: ≤ 50 mA
 AS-i Device insulation: internally short-circuit proof
 AS-i Specification
 - Version: V 3.0
 - Profile: S-0.B.F.F
 AS-i Inputs
 - Channel 1: Data bits DI 0/DI 1= dynamic code transmission
 - Channel 2: Data bits DI 2/DI 3= dynamic code transmission

Technical data

AS-i Outputs:
 - DO 0 ... DO 3: not used
 AS-i Parameter bits
 - P0: Channel 2 switched
 - P1 ... P3: not used
 AS-i input module address: 0
 - Default on address 0, programmable via the AS-Interface Master or Hand-held programming device

Classification

Standards: IEC 61508, EN ISO 13849-1
 PL: up to e
 Category: up to 4
 PFH value: ≤ 1.4 x 10⁻⁸/h
 - Notice: up to max. 5,000 switching cycles/year
 SIL: up to 3
 Mission time: 20 years

Approvals



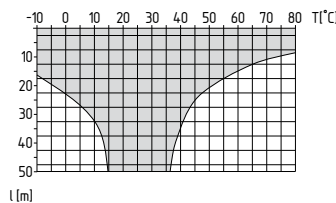
Ordering details

ZQ 900 ①-AS ②

No.	Option	Description
①	ST	Connector M12, bottom
	STR	Connector M12, right
	STL	Connector M12, left
	FK	Flat cable connection, bottom
	FKR	Flat cable connection, right
②	FKL	Flat cable connection, left
	Without	Emergency-Stop button
	N	With Emergency-Stop button

Note

Recommended cable lengths for pull-wire Emergency-Stop switches in relation to the range of ambient temperature.
 At 5 m distance intermediate wire supports are required, see accessories.



Note

The protection class for ordering suffix N reach only IP65 to IEC/EN 60529.

Pin configuration

M12 connector

5-pole



- PIN 1: AS-i +
- PIN 2: spare
- PIN 3: AS-i -
- PIN 4: spare
- PIN 5: FE (Functional earth connection)

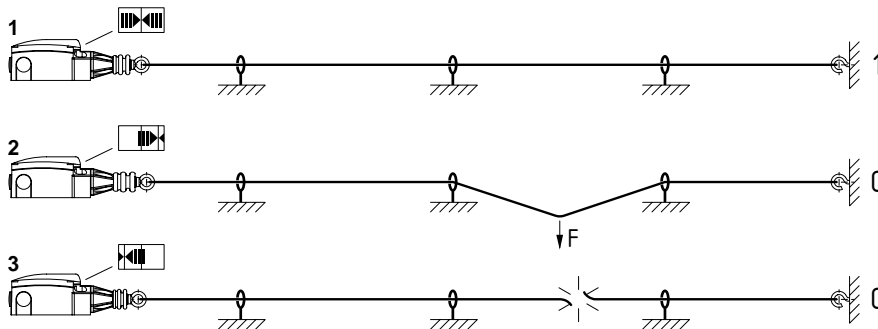
Addressing through the M12 connector or the flat cable connection

Mode of operation

Legend

- 1 Not actuated
- 2 Wire pull detection
- 3 Wire breakage detection

Wire pull and breakage detection

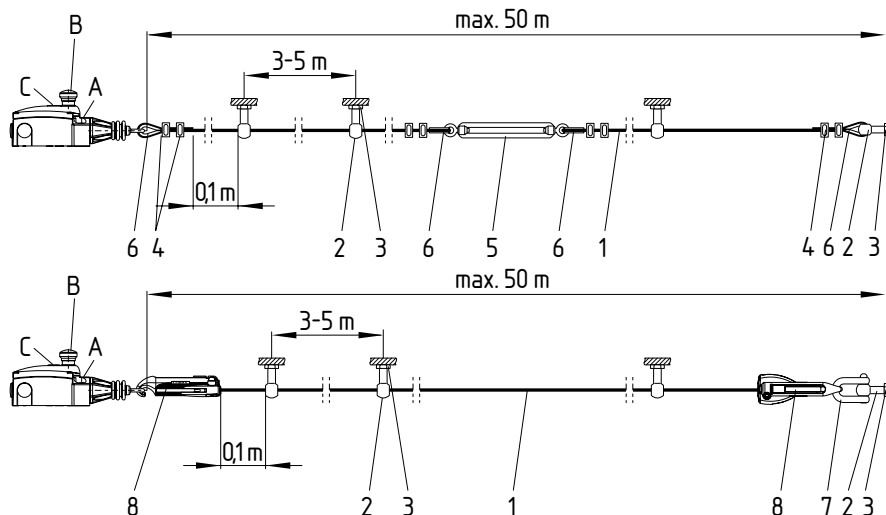


Mounting instructions

Legend

- 1 Wire rope
 - 2 Eyebolt
 - 3 Nut
 - 4 Wire clamp
 - 5 Tensioner
 - 6 Wire thimble
 - 7 Shackle
 - 8 Rope tensioner
- A Position indicator
B Emergency-stop pushbutton
C Nut

One-side operation

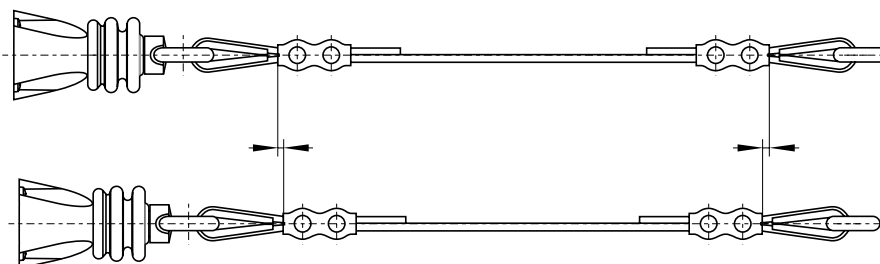


Mounting instructions

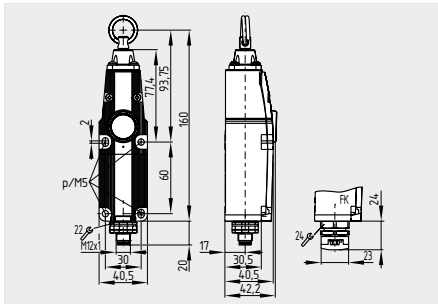
Note:

As the thimbles are subject to deformation in case of wire pull, the wire should be pulled several times after fitting. After that, the wire must be re-tensioned using the eyebolt or the tensioner.

Thimble deformation



ZQ 700 AS



- Pull-wire Emergency-Stop switches to EN ISO 13850 / IEC 60947-5-5
- Thermoplastic enclosure
- Double insulated
- Wire up to 10 m long
- Position indicator
- One tension force for wire lengths up to 10 m
- Reset button
- Twisting of connection ring not possible
- Wire pull and breakage function
- Integrated AS-I interface
- AS-Interface M12 connector or flat cable connection (turnable)
- Suitable for AS-i Power24
- Protection class IP67

Approvals



Ordering details

ZQ 700-①

No.	Option	Description
①	ST	Connector M12
	FK	Flat cable connection

Technical data

Standards: EN ISO 13850, EN 50295, IEC 61508, EN ISO 13849-1, EN 60947-5-1

Material of the housings: plastic, glass-fibre reinforced thermoplastic, self-extinguishing

Material of the cover: plastic, glass-fibre reinforced thermoplastic, self-extinguishing

Switching principle: snap action, NC contacts with positive break \ominus

Response time: < 100 ms

Mechanical data

Execution of the electrical connection: connector M12, 4-pole, or flat cable connection

Mechanical life: > 100,000 operations

Switching frequency: max. 1/s

Actuating force: max. 200 N

Actuating travel: max. 400 mm

Resistance to shock: 15 g / 11 ms

Resistance to vibration: 10 ... 150 Hz, amplitude 0.35 mm / 5 g

Length of wire: max. 50 m

Ambient conditions

Ambient temperature: -25 °C ... +60 °C

Storage and transport temperature: -25 °C ... +85 °C

Relative humidity: 30 %... 95 %

- non-condensing
- non-icing

Protection class: IP67

Protection rating: II

Electrical data - AS interface

AS-i Supply voltage: 18.0 ... 31.6 VDC, protection against polarity reversal

AS-i Operating current: \leq 50 mA

AS-i Device insulation: internally short-circuit proof

AS-i Specification

- Version: V 3.0

- Profile: S-0.B.F.F

AS-i Inputs

- Channel 1: Data bits DI 0/DI 1= dynamic code transmission

- Channel 2: Data bits DI 2/DI 3= dynamic code transmission

Technical data

AS-i Outputs:

- DO 0 ... DO 3: not used
- AS-i Parameter bits
- P0: Channel 2 switched
- P1 ... P3: not used
- AS-i input module address: 0
- Default on address 0, programmable via the AS-Interface Master or Hand-held programming device

Classification

Standards: IEC 61508, EN ISO 13849-1

PL: up to e

Category: up to 4

PFH value: $\leq 1.4 \times 10^{-8}$ /h

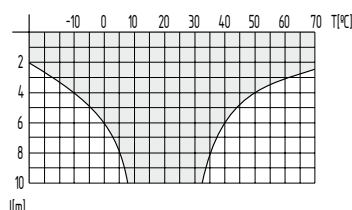
- Notice: up to max. 5,000 switching cycles/year

SIL: up to 3

Mission time: 20 years

Note

Recommended cable lengths for pull-wire Emergency-Stop switches in relation to the range of ambient temperature. At 2 to 5 m distance intermediate wire supports are required, see accessories.



Note

Pin configuration

M12 connector

4-pole



PIN 1: AS-i +
PIN 2: spare
PIN 3: AS-i -
PIN 4: spare

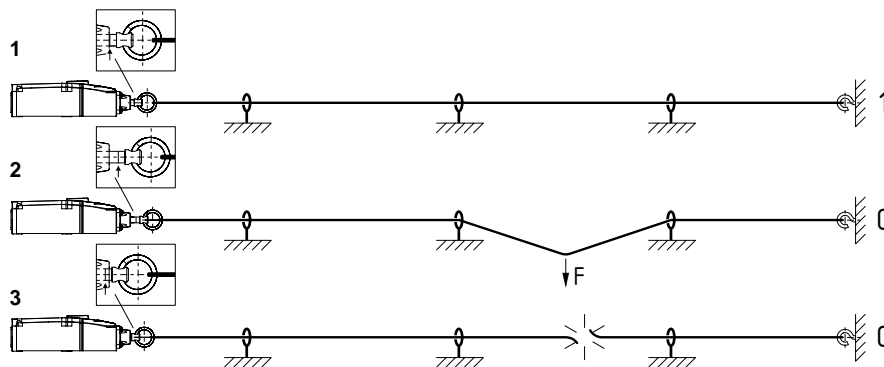
Addressing through the M12 connector or the flat cable connection

Mode of operation

Legend

- 1 Not actuated
- 2 Wire pull detection
- 3 Wire breakage detection

Wire pull and breakage detection

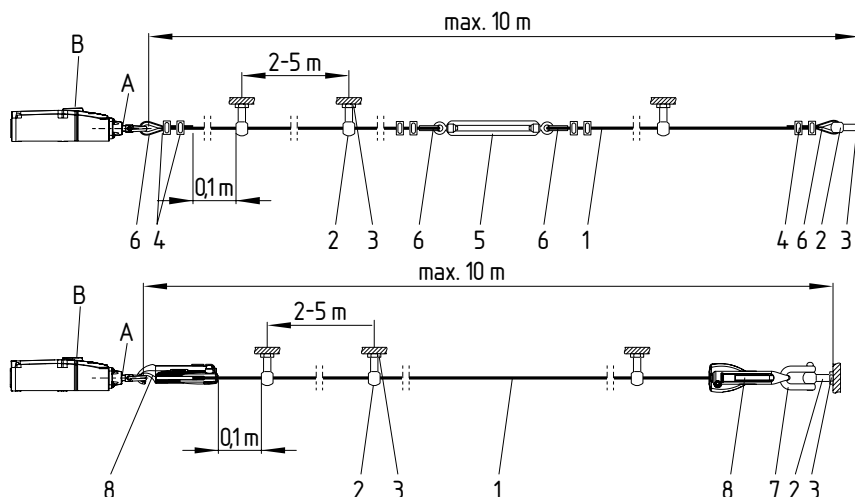


Mounting instructions

Legend

- 1 Wire rope
 - 2 Eyebolt
 - 3 Nut
 - 4 Wire clamp
 - 5 Tensioner
 - 6 Wire thimble
 - 7 Shackle
 - 8 Rope tensioner
- A Position indicator
B RESET pushbutton

One-side operation

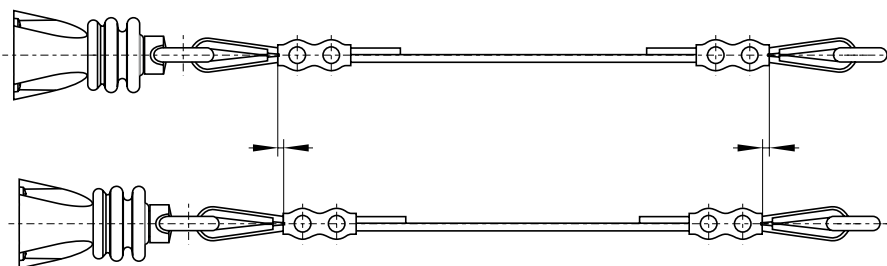


Mounting instructions

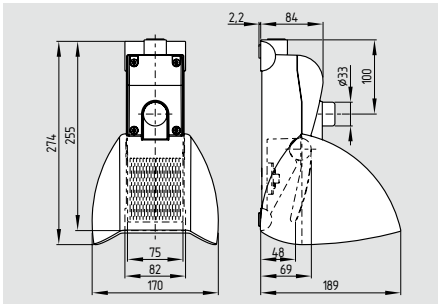
Note:

As the thimbles are subject to deformation in case of wire pull, the wire should be pulled several times after fitting. After that, the wire must be re-tensioned using the eyebolt or the tensioner.

Thimble deformation



TFH 232 ST-AS UEDR



- **Safety foot switch**
- Metal enclosure
- Protective shield with wide opening
- Low pedal height
- High level of stability
- Reset button
- With overlapping contacts (UE), pressure point (D) and latching (R)
- Integrated AS-I interface
- AS-Interface M12 connector (turnable)
- Suitable for AS-i Power24
- Protection class IP65

Technical data

Standards: EN ISO 13850, EN 50295, IEC 61508, EN ISO 13849-1, EN 60947-5-1

Material of the housings, cover and protective shield: Aluminium, powder-coated RAL 9006

Material of the pedal: Plastic, glass-fibre reinforced thermoplastic

Switching principle: slow action, 1 NO contact and 1 positive break NC contact ⊖

Response time: < 100 ms

Mechanical data

Execution of the electrical connection: connector M12, 5-pole

Mechanical life: > 200,000 operations

Switching frequency: max. 1/s

Resistance to shock: 15 g / 11 ms

Resistance to vibration: 10 ... 150 Hz, amplitude 0.35 mm / 5 g

Ambient conditions

Ambient temperature: -25 °C ... +60 °C

Storage and transport temperature: -25 °C ... +85 °C

Relative humidity: 30 %... 95 %

- non-condensing

- non-icing

Protection class: IP65

Electrical data - AS interface

AS-i Supply voltage: 18.0 ... 31.6 VDC, protection against polarity reversal

AS-i Operating current: 50 mA

AS-i Device insulation: internally short-circuit proof

AS-i Specification

- Version: V 3.0

- Profile: S-0.B.F.F

AS-i Inputs

- Channel 1: Data bits DI 0/DI 1= dynamic code transmission

- Channel 2: Data bits DI 2/DI 3= dynamic code transmission

AS-i Outputs:

- DO 0 ... DO 3: not used

AS-i Parameter bits

- P0: Channel 2 switched

- P1 ... P3: not used

Technical data

AS-i input module address: 0

- Default on address 0, programmable via the AS-Interface Master or Hand-held programming device

Classification

Standards: IEC 61508, EN ISO 13849-1

PL: up to c

Category: up to 1

PFH value: 1.14 x 10⁻⁶/h

- Notice: up to max. 36,500 switching cycles/year

2.94 x 10⁻⁶/h

- Notice: up to max. 100,000 switching cycles/year

up to 1

SIL: up to 1

Mission time: 20 years

Approvals



Ordering details

TFH 232 ST-AS UEDR

Note

Pin configuration

M12 connector

5-pole



PIN 1: AS-i +

PIN 2: spare

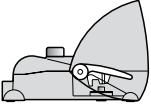
PIN 3: AS-i -

PIN 4: spare

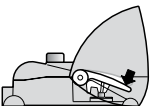
PIN 5: FE (Functional earth connection)

The addressing must take place via the M12 connector.

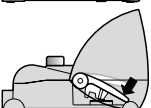
Mode of operation



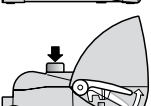
0



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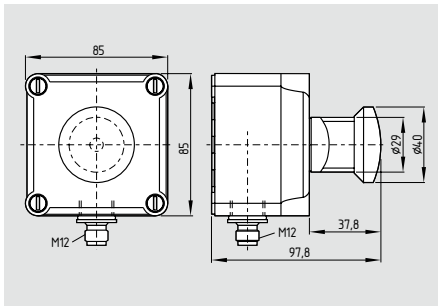


0



0 → 0

NAS 311 AS



- **E-STOP station**
- Integrated AS-I interface
- AS-Interface M12 connector
- Thermoplastic actuators and enclosures
- Pull to reset
- Resistant to chemicals
- Protection class IP65

Technical data

Standards: EN 50295, EN 60947-5-1, IEC 61508, EN ISO 13849-1, EN ISO 13850
 Material of the housings: plastic, glass-fibre reinforced polyamide, self-extinguishing (to UL-94-V-0)

Response time: < 100 ms

Mechanical data

Design of electrical connection: Connector M12, 4-pole

Mechanical life: > 100,000 operations

Ambient conditions

Ambient temperature: -25 °C ... +60 °C

Storage and transport

temperature: -25 °C ... +85 °C

Relative humidity: 30 % ... 95 %

- non-condensing

- non-icing

Protection class: IP65 to IEC/EN 60529

Electrical data - AS interface

AS-i Supply voltage: 26.5 ... 31.6 VDC, protection against polarity reversal

AS-i Operating current: ≤ 50 mA

AS-i Specification

- Version: V 2.1

- Profile: S-7.B.0.E

AS-i Inputs

- Channel 1: Data bits DI 0/DI 1= dynamic code transmission

- Channel 2: Data bits DI 2/DI 3= dynamic code transmission

AS-i Outputs

- DO 0 ... DO 3: not used

AS-i Parameter bits

- P0 ... P3: not used

AS-i input module address: 0

- Default on address 0, programmable via the AS-Interface Master or Hand-held programming device

Technical data

Dimensions

Dimensions: 85 mm x 85 mm x 97.8 mm

Classification

Standards: EN ISO 13849-1, IEC 61508

PL: up to e

Category: up to 4

PFH value: 1.4×10^{-8} /h

- Notice: up to max. 5,000

switching cycles/year

SIL: up to 3

Mission time: 20 years

Approvals



Ordering details

NAS 311 ST1-AS

Note

Pin configuration

M12 connector

4-pole



PIN 1: AS-i +

PIN 2: spare

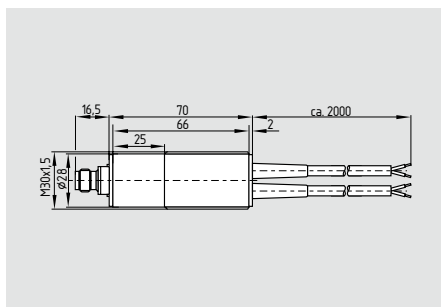
PIN 3: AS-i -

PIN 4: spare

Note

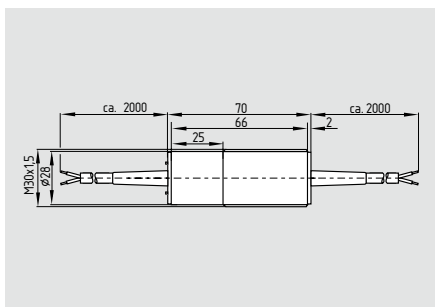
The addressing must take place via the M12 connector.

AST ... ST-AS



- Input module with M12 connector (AS-i)
- 2 safe inputs for mechanical contacts
- Connection of NC/NC contact or NC/NO contact combination
- Cross-wire monitoring
- Solenoid control through AS-Interface output
- Solenoid power supply via an external 24 VDC power supply (max. 0.5 A)
- AS-Interface LED and status display
- AS-Interface M12 connector
- Thermoplastic enclosure
- Long life
- Protection class IP67

AST ... L-AS



- Input module with cable (AS-i), length 2 m

Technical data

Standards: EN 50295, EN 61496-1, EN ISO 13849-1, IEC 61508
 Material of the housings: plastic, glass-fibre reinforced thermoplastic, self-extinguishing

Mechanical data

Design of electrical connection:
 - AS-i connection: Connector M12, 4-pole;
 Cable 2-pole
 - Sensor connection: Cable 2-pole, 4-pole or 6-pole
 Cable length: 2 m
 Cable section: 0.23 mm²

Ambient conditions

Ambient temperature: -25 °C ... +55 °C
 Storage and transport temperature: -25 °C ... +85 °C
 Relative humidity: 30 % ... 95 %
 - non-condensing
 Protection class: IP67 to IEC/EN 60529
 Protection rating: II □

Electrical data

Connection type: 1 NO / 1 NC

Electrical data - AS interface

AS-i Supply voltage: 26.5 ... 31.6 VDC, protection against polarity reversal
 AS-i Operating current: ≤ 50 mA
 AS-i Device insulation: internally short-circuit proof

AS-i Specification

- Version: V 2.1
 - Profile: S-7.B.F.E
 AS-i Inputs
 - Channel 1: Data bits DI 0/DI 1= dynamic code transmission
 - Channel 2: Data bits DI 2/DI 3= dynamic code transmission

AS-i Outputs

- DO 0: Solenoid control
 - DO 1 ... DO 3: not used
 AS-i Parameter bits: P0 ... P3 not used
 AS-i input module address: 0
 - Default on address 0, programmable via the AS-Interface Master or Hand-held programming device

Approvals



Ordering details

AST ①②-AS③④

No.	Option	Description
①	02	1 NC/1 NC
	11	1 NO/1 NC
②	AS-i connection:	
	ST	Connector M12
	L	Cable (2m)
③	Sensor connection:	
	2	2x cable 2-pole
	4	Cable 4-pole
	6	Cable 6-pole with solenoid control
④	Sensor connection:	
	ST	2x cable 2-pole with connector M12 or 1 x 4 (optional)

Note

AS-i connection

Connector M12

4-pole



PIN 1: AS-i +
 PIN 2: Aux - (AST...6)
 PIN 3: AS-i -
 PIN 4: Aux + (AST...6)

AS-i connection

Cable

2/4-pole

brown: AS-i +
 white: Aux - (AST...6)
 blue: AS-i -
 black: Aux + (AST...6)

Note

The addressing must take place via the cable end or the M12 connector.

Technical data

Inputs

Short-circuit recognition:	Yes
Number of NO contacts:	2
Number of NC contacts:	2

Outputs

Outputs 24 VDC:	1
-----------------	---

Electrical data - Auxiliary voltage (Aux)

Supply voltage U_B :	24 VDC (-15 % / +10 %) (stabilised PELV)
Operating current:	500 mA
Device insulation:	4 A (if used in accordance with UL 508)

AS-i LED switching conditions display

(1) green LED:	Supply voltage
(2) red LED:	Communication error
(3) yellow LED:	Enabling status

Dimensions

Dimensions:	86.5 mm x 28 mm
-------------	-----------------

Classification

Standards:	EN ISO 13849-1, IEC 61508
PL:	up to e
Category:	up to 4
PFH value:	$2.04 \times 10^{-9}/h$
SIL:	up to 3
Mission time:	20 years

Note

The wiring diagram is shown with guard doors closed and in de-energised condition.

The AST module can on be used for the connection of potential-free contacts. Additional LED's on the connecting wire are not acceptable.

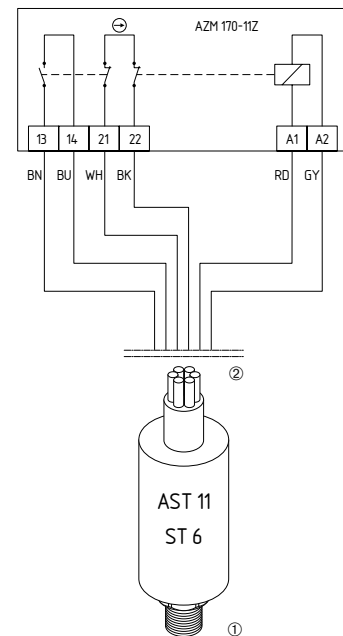
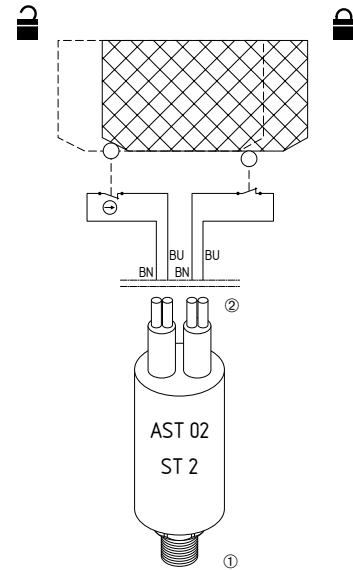
Monitoring a sliding guard door using two position switches with safety function. The NC contact must have positive break when the guard door is opened.

The module AST...AS is monitored by the AS-Interface. The locking solenoid is powered by an external power supply. Connection to the AS-Interface and the auxiliary power is made via a single M12 connector or via a 4-pole connecting cable.

The passive connection module (see page 57) links up the external solenoid power supply (auxiliary power supply, black cable) and the AS-i network connection (yellow cable) to a single M12 connector. A 4-wired cable makes the connection to the AST...ST6 module.

An internal output controls the solenoid operation. Depending on the interlocking device, output bit A0 locks or unlocks the actuator. Output bit A0 has the same address as the safety inputs.

Wiring diagram

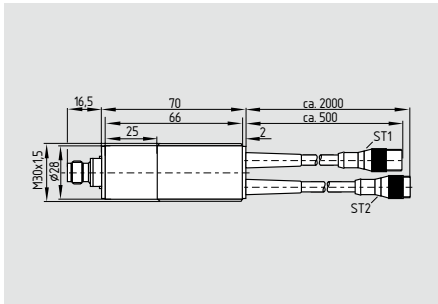


Note

Legend

- ① AS-i connection
- ② Sensor connection

AST LC ST-AS



- Input module for 2 monitored PNP semiconductor outputs for safety light curtains and light grids
- AS-Interface LED and status display
- AS-Interface M12 connector
- Thermoplastic enclosure
- Long life
- Protection class IP67

Technical data

Standards: EN 50295, EN 61496-1, EN ISO 13849-1, IEC 61508
 Material of the housings: plastic, glass-fibre reinforced thermoplastic, self-extinguishing
 Response time: ≤ 20 ms

Mechanical data

Design of electrical connection:
 - (ST) AS-i connection: Connector M12, 4-pole
 - (ST1) power supply for AOPDs: Cable with connector male M12, 5-pole
 - (ST2) AOPD connection: Cable with connector female M12, 5-pole

Ambient conditions

Ambient temperature: -25 °C ... +60 °C
 Storage and transport temperature: -25 °C ... +85 °C
 Protection class: IP67 to IEC/EN 60529

Electrical data

Power supply for AOPDs: stabilised PELV to IEC 364-4-41

Electrical data - AS interface

AS-i Supply voltage: 26.5 ... 31.6 VDC, protection against polarity reversal
 AS-i Operating current: ≤ 50 mA
 AS-i Device insulation: internally short-circuit proof

AS-i Specification

- Version: V 2.1
 - Profile: S-0.B.F.E
 AS-i Inputs
 - Channel 1: Data bits DI 0/DI 1= dynamic code transmission
 - Channel 2: Data bits DI 2/DI 3= dynamic code transmission

AS-i Outputs

- DO 0 ... DO 3: not used
 AS-i Parameter bits: P0 ... P3 not used
 AS-i input module address: 0
 - Default on address 0, programmable via the AS-Interface Master or Hand-held programming device

Technical data

AS-i LED switching conditions display

(1) green LED: Supply voltage
 (2) red LED: Communication error
 (3) yellow LED: Enabling status OSSD1/2

Dimensions

Dimensions: 86.5 mm x 28 mm

Classification

Standards: EN ISO 13849-1, IEC 61508
 PL: up to e
 Category: up to 4
 PFH value: 1.74 x 10⁻⁹/h
 SIL: up to 3
 Mission time: 20 years

Approvals



Ordering details

AST LC ST-AS

Note

Pin configuration M12 connector

male ST AS-Interface

4-pole

 PIN 1: AS-i +
 PIN 2: spare
 PIN 3: AS-i -
 PIN 4: spare

male ST1 Spannungsversorgung

5-pole

 PIN 1: + 24 VDC
 PIN 2: spare
 PIN 3: GND
 PIN 4: spare
 PIN 5: FE (Functional earth conn.)

female ST2 Connecting BWS

5-pole

 PIN 1: + 24 VDC
 PIN 2: OSSD 1
 PIN 3: GND
 PIN 4: OSSD 1
 PIN 5: FE (Functional earth conn.)

Note

The addressing must take place via the M12 connector.

System components



IDC connector M

System components



Passive connection module

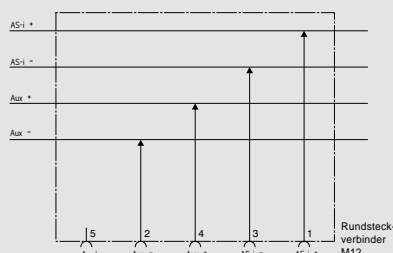
System components



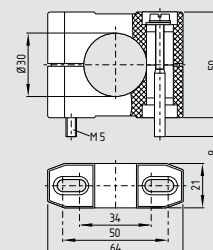
Terminal mounting



IDC connector K



Passive connection module



Terminal mounting

Ordering details

IDC connector M

Connection from the AS-i flat cable (yellow) to M12 connector

IDC connector K

Connection from the AS-i flat cable (yellow) to a circular cable

Ordering details

Passive connection module 0911 ANC 101

Passive connection module (IDC) for the yellow and black flat cable to a M12 connector plug

Ordering details

Terminal mounting H 30

Mounting brackets for all AS-i Tube modules with M30 housing

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For many years the privately owned Schmersal Group has been developing and manufacturing products to enhance occupational safety. What started out with the development and manufacture of a

Motivated by the vision of a safe working environment, the Schmersal Group's engineers are constantly working on the development of new devices and systems for every imaginable application and requirement of the different industries. New safety concepts require new solutions and it is necessary to integrate new detection principles and to discover new paths for the transmission and evaluation of the information provided by these principles. Furthermore, the set of ever more complex standards, regulations and directives relating to machinery safety also requires a change in thinking from the manufacturers and users of machines.

very wide variety of mechanical and non-contact switchgear has now become the world's largest range of safety systems and solutions for the protection of man and machine. Over 1,200 employees in more than 20 countries around the world are developing safety technology solutions in close cooperation with our customers, thus contributing to a safer world.

These are the challenges which the Schmersal Group, in partnership with machinery manufacturers, is tackling and will continue to tackle in the future.

Product ranges	Industries	Services	Competences
 <p>Safe switching and monitoring</p> <ul style="list-style-type: none"> ■ Guard door monitoring safety switches ■ Command devices with safety function ■ Tactile safety devices ■ Optoelectronic safety devices <p>Safe signal processing</p> <ul style="list-style-type: none"> ■ Safety monitoring modules ■ Safety controllers ■ Safety bus systems <p>Automation</p> <ul style="list-style-type: none"> ■ Position detection ■ Command and signalling devices 	 <ul style="list-style-type: none"> ■ Elevators and escalators ■ Packaging ■ Food ■ Medicine/ pharmaceuticals ■ Machine tools ■ Wood working ■ Construction machines and cranes ■ Renewable energy sources ■ Automotive ■ Chemical industry 	 <ul style="list-style-type: none"> ■ Application advice ■ CE conformity assessment ■ Risk assessment in accordance with the Machinery Directive ■ Stop time measurements ■ Training courses 	 <ul style="list-style-type: none"> ■ Machine safety ■ Automation ■ Explosion protection ■ Hygienic design

All data mentioned in this flyer have been carefully checked. Technical modifications and errors excepted.

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