

# **EUCHNER**

## **Operating Instructions**

Safety Systems  
**MGB-L..B-PN.-... (PROFINET)**  
with Data Structure Type B  
from V3.30.0

**EN**

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## 1. About this document

### 1.1. Scope

These operating instructions are valid for all MGB-L..B-PN-... (PROFINET) and with Data Structure Type B. These operating instructions, the document "Safety information and maintenance" and any enclosed data sheet form the complete user information for your device.

| Series | Guard locking types                  | System families | Product versions |
|--------|--------------------------------------|-----------------|------------------|
| MGB    | L0 (without guard locking)           | ...PN...        | from V3.30.1     |
|        | L1 (guard locking by spring force)   |                 | from V3.30.1     |
|        | L2 (guard locking by solenoid force) |                 | from V3.30.0     |






#### 1.1.1. Notes on older product versions

Products with lower product versions or without a version number are not described by these operating instructions. Please contact our support team in this case.

### 1.2. Target group



Design engineers and installation planners for safety devices on machines, as well as setup and servicing staff possessing special expertise in handling safety components


### 1.3. Key to symbols

| Symbol/depiction                                                                                                                         | Significance                                                                                                                                         |
|------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                        | Printed document                                                                                                                                     |
|                                                       | Document is available for download at <a href="http://www.EUCHNER.de">www.EUCHNER.de</a>                                                             |
|                                                       | Document on CD                                                                                                                                       |
| <br><b>DANGER</b><br><b>WARNING</b><br><b>CAUTION</b> | Safety precautions<br><b>Danger</b> of death or severe injuries<br><b>Warning</b> about possible injuries<br><b>Caution</b> Slight injuries possible |
| <br><b>NOTICE</b><br><b>Important!</b>                | <b>Notice</b> about possible device damage<br><b>Important</b> information                                                                           |
| <b>Tip</b>                                                                                                                               | Tip/useful information                                                                                                                               |

### 1.4. Supplementary documents

The overall documentation for this device consists of the following documents:

| Document title (document number) | Contents                                                |                                                                                       |
|----------------------------------|---------------------------------------------------------|---------------------------------------------------------------------------------------|
| Operating instructions (115174)  | (this document)                                         |  |
| Possibly enclosed data sheet     | Item-specific information about deviations or additions |  |

|                                                                                     |                                                                                                                                                                                                                                                                                       |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <b>Important!</b><br>Always read all documents to gain a complete overview of safe installation, setup and use of the device. The documents can be downloaded from <a href="http://www.euchner.de">www.euchner.de</a> . Enter the document number in the search box for this purpose. |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## 2. Correct use

### The following applies to MGB-L0:

The system comprises at least one interlocking module MGB-L0-... and one handle module MGB-H...

The safety system MGB is an interlocking device without guard locking (type 4). Devices with unicode evaluation possess a high coding level; devices with multicode evaluation feature a low coding level.

In combination with a movable safety guard and the machine control, this safety component prevents dangerous machine functions from occurring while the safety guard is open. A stop command is triggered if the safety guard is opened during the dangerous machine function.

This means:

- Starting commands that cause a dangerous machine function must become active only when the safety guard is closed.
- Opening the safety guard triggers a stop command.
- Closing a safety guard must not cause automatic starting of a dangerous machine function. A separate start command must be issued. For exceptions, refer to EN ISO 12100 or relevant C-standards.

### The following applies to MGB-L1/MBG-L2:

The system comprises at least one locking module MGB-L1-.../MGB-L2-... and one handle module MGB-H...

The safety system MGB is an interlocking device with guard locking (type 4). Devices with unicode evaluation possess a high coding level; devices with multicode evaluation feature a low coding level.

In combination with a movable safety guard and the machine control, this safety component prevents the safety guard from being opened while a dangerous machine function is being performed.

This means:

- Starting commands that cause a dangerous machine function must become active only when the safety guard is closed and locked.
- The guard locking device must not be unlocked until the dangerous machine function has ended.
- Closing and locking a safety guard must not cause automatic starting of a dangerous machine function. A separate start command must be issued. For exceptions, refer to EN ISO 12100 or relevant C-standards.

### For MGB-L0 /MGB-L1 / MGB-L2

The interlocking module MGB-LOB-PN-... and the locking module MGB-L1B-PN-.../MGB-L2B-PN-... are operated as IO devices in the PROFINET (PROFIsafe).

Before the device is used, a risk assessment must be performed on the machine, e.g. in accordance with the following standards:

- EN ISO 13849-1, Safety of machinery – Safety-related parts of control systems – Part 1: General principles for design
- EN ISO 12100, Safety of machinery – General principles for design – Risk assessment and risk reduction
- IEC 62061, Safety of machinery – Functional safety of safety-related electrical, electronic and programmable electronic control systems

Correct use includes observing the relevant requirements for installation and operation, particularly based on the following standards:

- EN ISO 13849-1, Safety of machinery – Safety-related parts of control systems – Part 1: General principles for design
- EN ISO 14119 (supersedes EN 1088), Safety of machinery – Interlocking devices associated with guards – Principles for design and selection
- EN 60204-1, Safety of machinery – Electrical equipment of machines – Part 1: General requirements

The safety system MGB can only be combined with the intended modules in the MGB system family.

On the modification of system components, EUCHNER provides no warranty for function.

The customer is responsible for the safe overall function, especially for the safe integration into the PROFIsafe environment.



**Important!**

- › The user is responsible for the proper integration of the device into a safe overall system. For this purpose, the overall system must be validated, e.g. in accordance with EN ISO 13849-2.
- › Correct use requires observing the permissible operating parameters (see chapter 17. *Technical data on page 40*).
- › If a product data sheet is included with the product, the information on the data sheet applies in case of discrepancies with the operating instructions.

Table 1: Possible combinations for MGB components

| Evaluation unit          | Handle module |                         |
|--------------------------|---------------|-------------------------|
| MGB...PN<br>from V3.30.0 |               | MGB-H...<br>from V2.0.0 |
|                          | ●             |                         |
| <b>Key to symbols</b>    | ●             | Combination possible    |

## 3. Description of the safety function

Devices from this series feature the following safety functions:

**The following applies in case of active guard lock monitoring (ÜK, bit S11.1):**

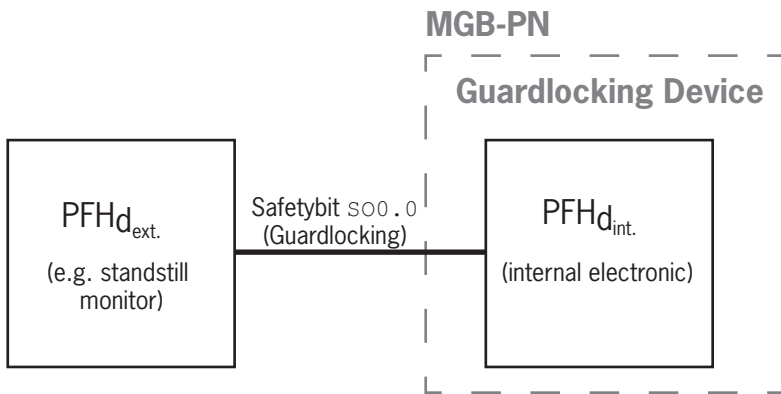
**Monitoring of guard locking and the position of the safety guard (interlocking device with guard locking according to EN ISO 14119)**

- ▶ Safety function (see chapter 6. *Function on page 10*):
  - When guard locking is unlocked, safety bit S11.1 (ÜK) = 0 (monitoring of the locking device).
  - When the safety guard is open, safety bit S11.0 (SK) = 0.
  - Guard locking can be activated only when the bolt tongue is located in the locking module (failsafe locking mechanism).
- ▶ Safety characteristics: category, Performance Level, PFH<sub>d</sub> (see chapter 17. *Technical data on page 40*).

**Control of guard locking (safety bit so 0.0)**

- ▶ Safety function.  
If the device is used as guard locking for personnel protection, control of guard locking must be regarded as a safety function.

The safety level of guard locking control is determined by the device PFH<sub>d<sub>int.</sub></sub> and by the external control (e.g. PFH<sub>d<sub>ext.</sub></sub> of the standstill monitor).



- ▶ Safety characteristics: category, Performance Level, PFH<sub>d</sub> (see chapter 17. *Technical data on page 40*).

**The following applies in case of inactive guard lock monitoring (ÜK, bit S11.1):**

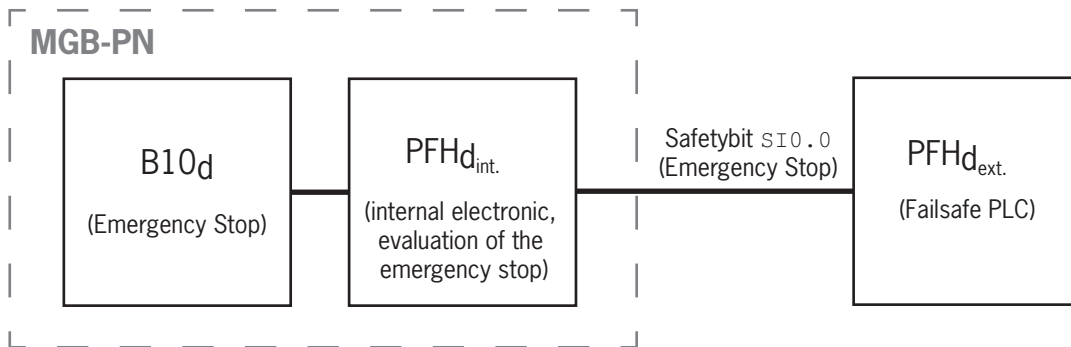
**Monitoring of the safety guard position (interlocking device according to EN ISO 14119)**

- ▶ Safety function: When the safety guard is open, safety bit S11.0 (SK) = 0 (see chapter 6. *Function on page 10*).
- ▶ Safety characteristics: category, Performance Level, PFH<sub>d</sub> (see chapter 17. *Technical data on page 40*).

The following applies to devices with emergency stop:

**Emergency stop**  
(emergency stop device according to EN ISO 13850)

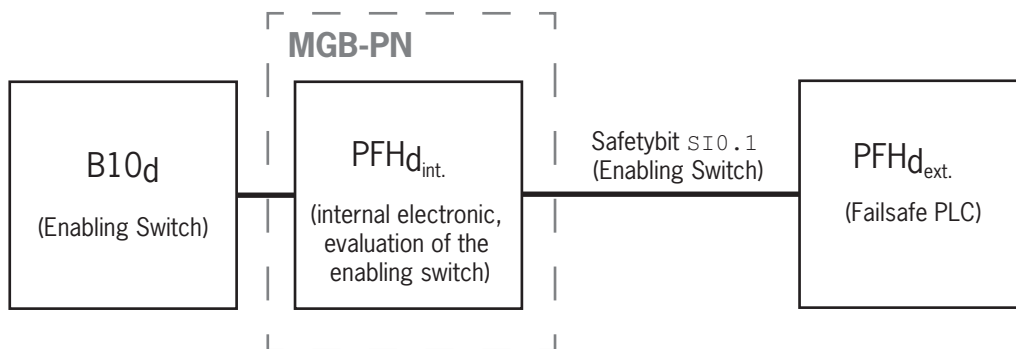
- › Safety function: evaluation of emergency stop
- › Safety characteristics:  $B_{10d}$  value of emergency stop and  $PFH_d$  for the evaluation electronics (see chapter 17. Technical data on page 40)



The following applies to devices with connection for enabling switch:

**Enabling function**

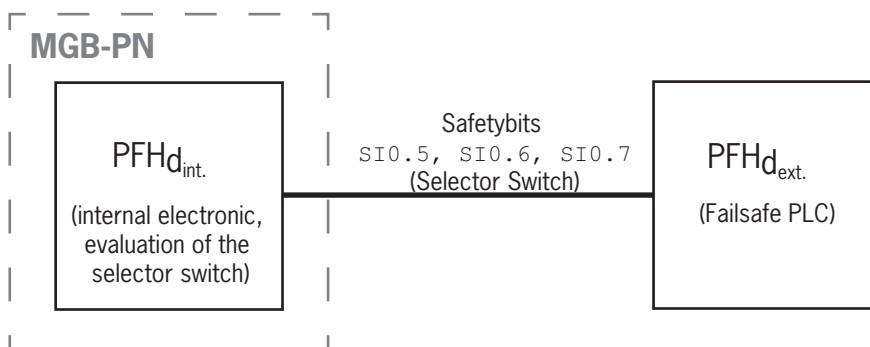
- › Safety function: evaluation of a connected enabling switch
- › Safety characteristics:  $B_{10d}$  value of the enabling switch (see manufacturer's information) and  $PFH_d$  for the evaluation electronics (see chapter 17. Technical data on page 40)



For devices with selector switch:

**Detection of the switch position**

- › Safety function: evaluation of the switch position, e.g. for safe switchover between individual operating modes
- › Safety characteristics:  $PFH_d$  for the evaluation electronics (see chapter 17. Technical data on page 40). The switch position is scanned electronically, so there is no  $B_{10d}$  value for the switch.





## 4. Exclusion of liability and warranty

In case of failure to comply with the conditions for correct use stated above, or if the safety instructions are not followed, or if any servicing is not performed as required, liability will be excluded and the warranty void.

## 5. General safety instructions

Safety switches fulfill personal protection functions. Incorrect installation or tampering can lead to fatal injuries to personnel.

Check the safe function of the safety guard particularly

- › after any setup work
- › after the replacement of an MGB component
- › after an extended period without use
- › after every fault
- › after any change to the DIP switch setting

Independent of these checks, the safe function of the safety guard should be checked at suitable intervals as part of the maintenance schedule.



### WARNING

Danger to life due to improper installation or due to bypassing (tampering). Safety components perform a personal protection function.

- › Safety components must not be bypassed, turned away, removed or otherwise rendered ineffective. On this topic pay attention in particular to the measures for reducing the possibility of bypassing according to EN ISO 14119:2013, section 7.
- › The switching operation is only allowed to be triggered by the intended handle module MGB-H... that is positively fastened to the safety guard.
- › Prevent bypassing by means of replacement actuators (only for multicode evaluation). For this purpose, restrict access to actuators and to keys for releases, for example.
- › Mounting, electrical connection and setup only by authorized personnel possessing the following knowledge:
  - specialist knowledge in handling safety components
  - knowledge about the applicable EMC regulations
  - knowledge about the applicable regulations on occupational safety and accident prevention.



### Important!

Prior to use, read the operating instructions and keep these in a safe place. Ensure the operating instructions are always available during mounting, setup and servicing. EUCHNER cannot provide any warranty in relation to the readability of the CD for the storage period required. For this reason you should archive a printed copy of the operating instructions. You can download the operating instructions from [www.euchner.de](http://www.euchner.de).

## 6. Function

### 6.1. Interlocking module MGB-L0.B-PN.

Together with a handle module, the interlocking module makes it possible to interlock moving safety guards. The combination also serves as a mechanical door stop at the same time.

The following switch-on condition applies to safety bit  $SI1.0$  (SK):

- Safety guard closed (T)
- Bolt tongue inserted into interlocking module (R)

See also chapter 16. *System status table on page 39* and chapter 13.10. *PROFIsafe data bytes (data block for safe functions) on page 35*.

The interlocking module detects the position of the safety guard and the position of the bolt tongue.

The bolt tongue in the handle module is moved into and out of the interlocking module by actuating the door handle.

### 6.2. Locking module MGB-L1.B-PN. and MGB-L2.B-PN.

Together with a handle module, the locking module makes it possible to lock moving safety guards. The combination also serves as a mechanical door stop at the same time.



#### Important!

To operate the device as a guard lock for personnel protection according to EN ISO 14119, the signals for door position (T=PROFIsafe bit  $SI0.2$ ), bolt position (R= PROFIsafe bit  $SI0.3$ ) and guard lock monitoring (Z= PROFIsafe bit  $SI0.4$ ) must be polled in a logical AND operator. This operator is already implemented in the PROFIsafe data block (ÜK=safety bit  $SI1.1$ ).

As an alternative, you can also link the bits  $SI0.2$  to  $SI0.4$  individually in your control system.

The following switch-on condition applies to safety bit  $SI1.1$  (ÜK):

- Safety guard closed (T)
- Bolt tongue inserted into locking module (R)
- Locking arm in locking position (guard lock monitoring) (Z)

See also chapter 16. *System status table on page 39* and chapter 13.10. *PROFIsafe data bytes (data block for safe functions) on page 35*.

The locking module detects the position of the safety guard and the position of the bolt tongue. The position of the locking arm is also monitored.

The bolt tongue in the handle module is moved into and out of the locking module by actuating the door handle.

When the bolt tongue is fully inserted in the locking module, the locking arm locks the bolt tongue in this position. Depending on the version, this locking is by spring force or solenoid force.

## 6.3. Guard locking for version MGB-L1

(guard locking actuated by spring force and released by energy ON)

**Activating guard locking:** close safety guard; no voltage at the solenoid (safety bit  $sO\ 0.0 = 0$ ).

**Releasing guard locking:** apply voltage to the solenoid (safety bit  $sO\ 0.0 = 1$ ).

The spring-operated guard locking functions in accordance with the closed-circuit current principle. If voltage is interrupted at the solenoid, guard locking remains active and the safety guard cannot be opened directly.



### Important!

If the safety guard is open when the power supply is interrupted and the guard is then closed, guard locking is activated. This can lead to persons being locked in unintentionally.

As long as the locking arm is closed, the bolt tongue cannot be pulled out of the locking module and the safety guard is locked.

When voltage is applied to the locking solenoid, the locking arm is opened and bolt tongue is released. The safety guard can be opened.

## 6.4. Guard locking for version MGB-L2

(guard locking actuated by energy ON and released by spring force)



### Important!

Use as guard locking for personnel protection is possible only in special cases, after strict assessment of the accident risk (see EN ISO 14119:2013, section 5.7.1)!

**Activating guard locking:** apply voltage to the solenoid (safety bit  $sO\ 0.0 = 1$ ).

**Releasing guard locking:** disconnect voltage from the solenoid (safety bit  $sO\ 0.0 = 0$ ).

The magnetically actuated guard locking operates in accordance with the open-circuit current principle. If voltage is interrupted at the solenoid, guard locking is released and the safety guard can be opened directly!

The safety guard can be opened as long as no voltage is applied to the guard locking solenoid.

When voltage is present at the guard locking solenoid, the the locking arm is held in locked position and the safety guard is locked.

## 6.5. Control of the guard locking

From MGB version V2.36.4, the factory ensures that control is possible only from the safe control area.

By changing the parameters in the configuration tool of your control system, it can be set whether bit  $o\ 0.0$  (in the safe data block for the MGB locking module) is evaluated as well (see chapter 13.8.2. Data block for MGB locking module L0, L1 or L2 on page 31).



### Important!

#### The following applies to MGB-L2:

Control of the guard locking via the safe control area does not provide increased safety, as the device-internal control of the guard locking is only of single-channel design.



### Important!

The following functions depend on the MGB version, the version of the GSD file and the settings made there.

Compare the specified versions with those on your device and your GSD file. The version number of your MGB can be found on the type plate (format: VX.XX.X).

| MGB version                 | GSD version                          | Continue in section ... |
|-----------------------------|--------------------------------------|-------------------------|
| up to and including V2.35.4 | ..._110026- <b>20110725</b>          | Case A                  |
|                             | ..._110026- <b>20110815</b>          | Case A                  |
| from V3.30.0                | ..._110026- <b>20110725</b>          | Case B                  |
|                             | ..._110026- <b>20110815</b> or newer | Case C                  |

### 6.5.1. Case A

You have an MGB with a version number of V2.35.4 and a GSD file with a version number of ...\_110026-20110725 or older. Or you have an MGB with a version number of V2.35.4 and a GSD file with a version number from ...\_110026-20110815.

The guard locking solenoid is controlled if

▸ bit  $o\ 0.0$  **OR** bit  $so\ 0.0 = 1$

#### Truth table

| PROFINET bit<br>$o\ 0.0$ | PROFIsafe bit<br>$so\ 0.0$ | Guard locking with |           |
|--------------------------|----------------------------|--------------------|-----------|
|                          |                            | MGB-L1...          | MGB-L2... |
| 0                        | 0                          | active             | inactive  |
| 0                        | 1                          | inactive           | active    |
| 1                        | 0                          | inactive           | active    |
| 1                        | 1                          | inactive           | active    |

#### What must be observed?

The guard locking can be controlled from the unsafe control area. The combination with the more up-to-date GSD file allows a parameter to specify which bits are to be used for control. However, the device does not support this function. In other words, the setting in your configuration software remains ineffective.

## 6.5.2. Case B

You have an MGB with a version number of V3.30.0 and a GSD file with a version number of ...\_110026-20110725 or older.

The guard locking solenoid is controlled if

for MGB-L1...

▸ bit SO 0.0 = 1

for MGB-L2...

▸ bit O 0.0 **OR** bit SO 0.0 = 1

### Truth table

| PROFINET bit<br>O 0.0 | PROFIsafe bit<br>SO 0.0 | Guard locking with |           |
|-----------------------|-------------------------|--------------------|-----------|
|                       |                         | MGB-L1...          | MGB-L2... |
| 0                     | 0                       | active             | inactive  |
| 0                     | 1                       | inactive           | active    |
| 1                     | 0                       | active             | active    |
| 1                     | 1                       | inactive           | active    |

### What must be observed?

Bit O 0.0 does not have any function with version MGB-L1.... In existing installations in which old devices are replaced with new ones (e.g. due to defect), malfunctions can occur if control via bit O 0.0 was programmed in the PLC.

### Remedy:

1. Replace the old GSD file with a version from ...\_110026-20110815.
2. In the parameter *Locking module – solenoid control*, activate unsafe control of the guard locking solenoid via bit O 0.0.
3. Set bit SO 0.0 permanently to the value 1.

➔ The guard locking solenoid is controlled exclusively via bit O 0.0

or

▸ Change the control bit from O 0.0 to SO 0.0 in your PLC program.

### 6.5.3. Case C

You have an MGB with a version number of V3.30.0 and a GSD file with a version number from ...\_110026-20110815.

The guard locking solenoid is controlled if:

- bit SO 0.0 = 1 (factory setting)

#### Truth table

| PROFINET bit<br>O 0.0<br>irrelevant | PROFIsafe bit<br>SO 0.0 | Guard locking with |           |
|-------------------------------------|-------------------------|--------------------|-----------|
|                                     |                         | MGB-L1...          | MGB-L2... |
| 0                                   | 0                       | active             | inactive  |
| 0                                   | 1                       | inactive           | active    |
| 1                                   | 0                       | active             | inactive  |
| 1                                   | 1                       | inactive           | active    |

#### What must be observed?

You can define in the GSD file whether bit O 0.0 may be used for control in addition to bit SO 0.0. The setting is specified in the parameter *Locking module – solenoid control*.

If O 0.0 is additionally used, the guard locking solenoid is controlled if

for MGB-L1...

- bit SO 0.0 **AND** bit O 0.0 = 1

for MGB-L2...

- bit SO 0.0 **OR** bit O 0.0 = 1

#### Truth table

| PROFINET bit<br>O 0.0 | PROFIsafe bit<br>SO 0.0 | Guard locking with |           |
|-----------------------|-------------------------|--------------------|-----------|
|                       |                         | MGB-L1...          | MGB-L2... |
| 0                     | 0                       | active             | inactive  |
| 0                     | 1                       | active             | active    |
| 1                     | 0                       | active             | active    |
| 1                     | 1                       | inactive           | active    |

## 7. System overview

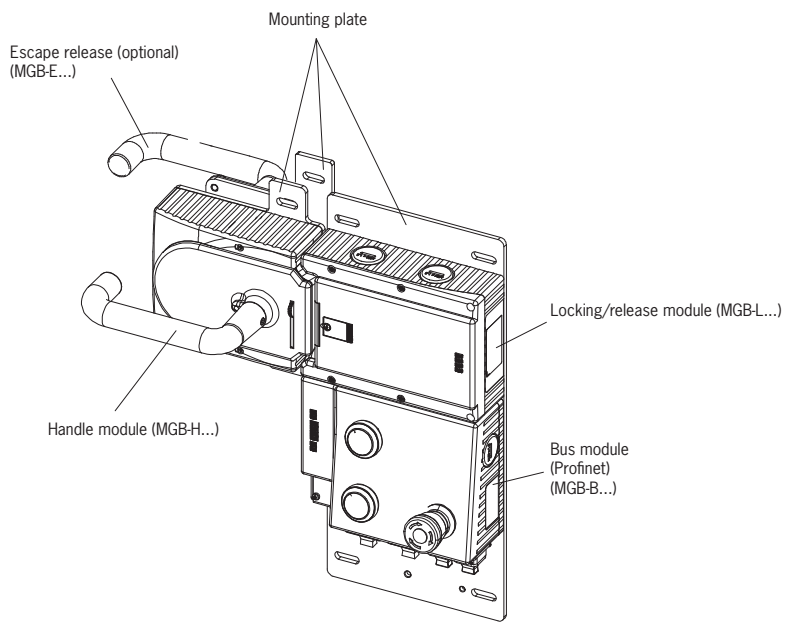


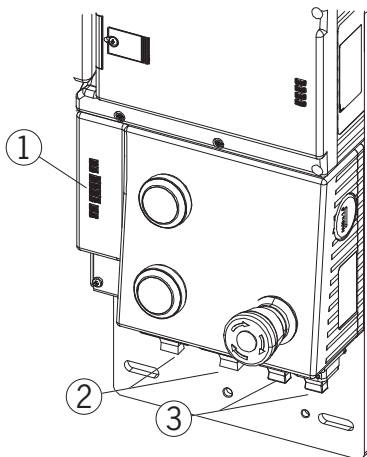
Figure 1: Components at a glance



### NOTICE

MGB-PN systems are completely factory configured. The configuration must not be changed subsequently. The illustrations in this chapter can deviate from your system and serve only as examples. The configuration of your MGB system can be found in the data sheet included with every MGB system.

### 7.1. Bus module MGB-B-...-PN



#### Key:

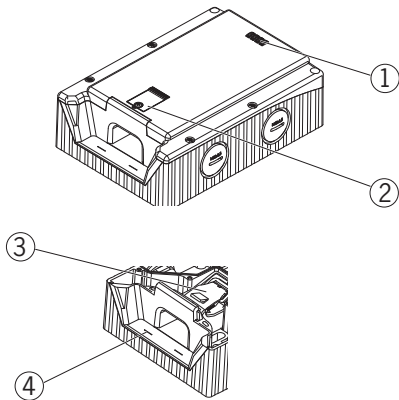
- ① LED indicator
- ② Power supply
- ③ PROFINET connection

#### Notice:

Depending on the version, additional controls and indicators may be integrated into the cover. See enclosed data sheet.

Figure 2: Bus module MGB-B-...-PN (configuration example)

## 7.2. Locking/release module MGB-L.-



**Key:**

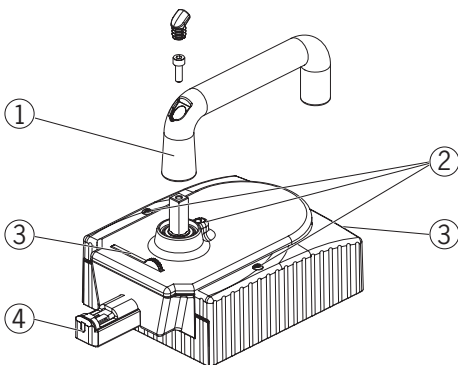
- ① LED indicator
- ② Cover for mechanical release
- ③ Locking arm (only for version with guard locking)
- ④ Auxiliary marking for max. permitted mounting distance

**Notice:**

Depending on the version, additional controls and indicators may be integrated into the cover. See enclosed data sheet.

Figure 3: Locking/release module MGB-L.-

## 7.3. Handle module MGB-H...



**Key:**

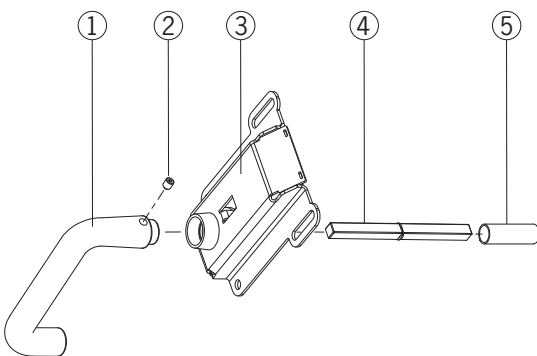
- ① Door handle
- ② Locking screws T10 for housing cover and handle adjustment
- ③ Fold-out lockout mechanism  
(optional: second, automatically extending lockout mechanism)
- ④ Bolt tongue

**Notice:**

Depending on the version, a mounting plate can be included. See enclosed data sheet.

Figure 4: Handle module MGB-H...

## 7.4. Escape release MGB-E... (optional)



**Key:**

- ① Door handle
- ② Setscrew
- ③ Cover
- ④ Actuation axis 8 x 8 mm  
(different lengths available)
- ⑤ Protective sleeve

**Notice:**

Depending on the version, a mounting plate can be included. See enclosed data sheet.

Figure 5: Escape release MGB-E...

## 7.5. Dimension drawing

See enclosed data sheet.

## 7.6. Manual release



Some situations require guard locking to be released manually (e.g. malfunctions or an emergency). A function test should be performed after release.

More information on this topic can be found in the standard EN ISO 14119:2013, section 5.7.5.1. The device can feature the following release functions:



## 7.7. Mechanical release

In the event of service, the guard locking can be released with the mechanical release irrespective of the state of the solenoid (see Figure 6).

|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p><b>Important!</b></p> <ul style="list-style-type: none"> <li>▸ The system enters into a latching fault when the mechanical release is actuated. See <i>System status table, signal sequence incorrect</i> status (DIA red, Lock flashes 1 time).</li> <li>▸ The system might not enter into a latching fault if the mechanical release is actuated very slowly.</li> </ul>                                                                                                                                                                                                                                                                                                                            |
|  | <p><b>Important!</b></p> <ul style="list-style-type: none"> <li>▸ The mechanical release is not a safety function.</li> <li>▸ The machine manufacturer must select and use a suitable release (escape release, emergency unlocking, etc.) for a specific application. A risk assessment is required for this purpose. It may be necessary to take specifications from a product standard into account.</li> <li>▸ The correct function must be checked at regular intervals.</li> <li>▸ Loss of the release function due to mounting errors or damage during mounting. Check the release function every time after mounting.</li> <li>▸ Please observe the notes on any enclosed data sheets.</li> </ul> |

The locking screw must be screwed back in and sealed (for example with sealing lacquer) after assembly and after every use of the mechanical release. Tightening torque 0.5 Nm.

1. Undo locking screw.
2. Lift locking arm using a screwdriver and actuate door handle.

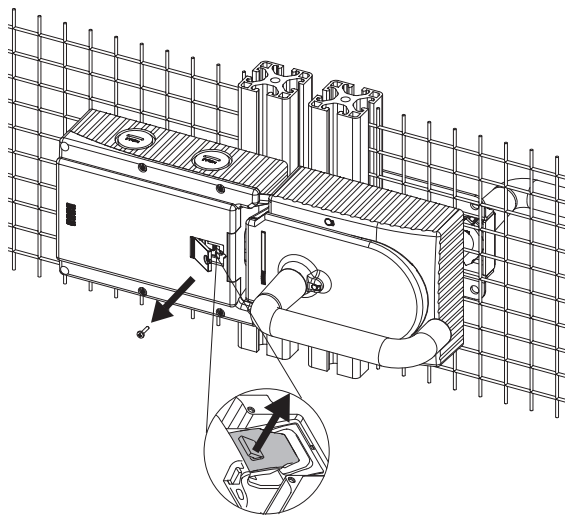


Figure 6: Mechanical release

## 7.8. Lockout mechanism

If the lockout mechanism is pivoted out/extended, the bolt tongue cannot be extended. The lockout mechanism can be secured with padlocks (see *Figure 7*). This is intended to prevent people from being locked in unintentionally. The lockout mechanism does not fulfill any safety function.

➔ To pivot out, press the grooved part (only possible with bolt tongue retracted).

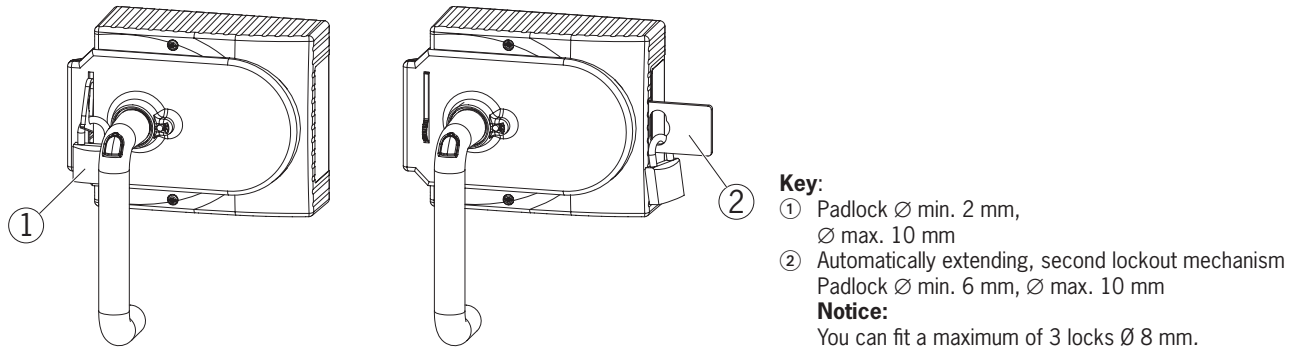


Figure 7: Lockout mechanism secured with padlock

## 7.9. Escape release (optional)

The escape release is used to open a locked safety guard from the inside without tools.

The system enters into a latching fault when the escape release is actuated.

See chapter 16. *System status table on page 39, signal sequence incorrect status (DIA red, Lock flashes 1 time).*

The system might not enter into a latching fault if the escape release is actuated very slowly.



### Important!

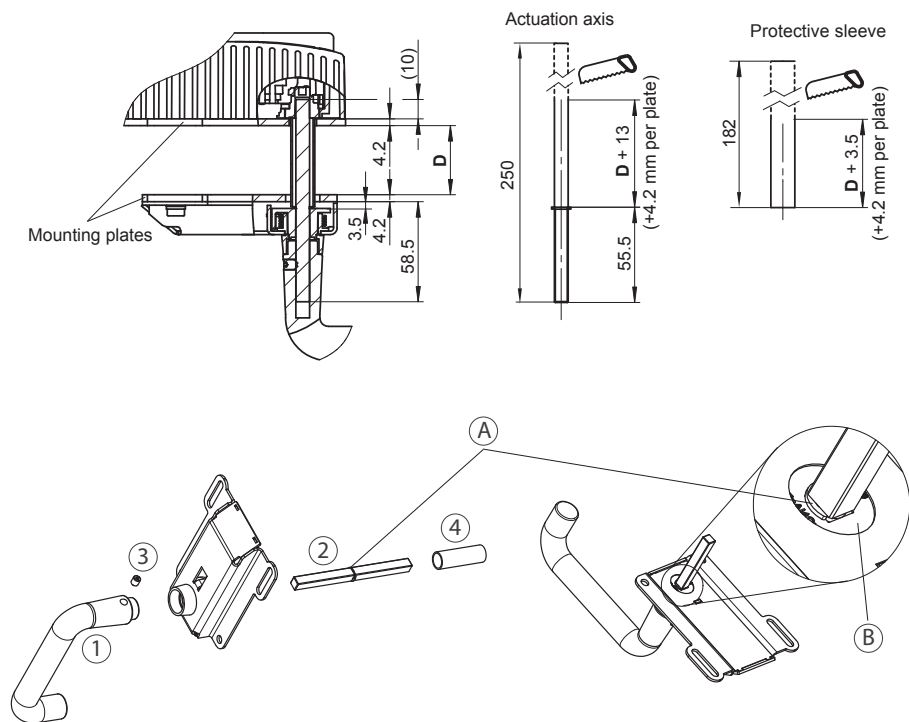
- › It must be possible to operate the escape release manually from inside the protected area without tools.
- › It must not be possible to reach the escape release from the outside.
- › The actuator must not be under tensile stress during manual release.
- › The escape release meets the requirements of Category B according to EN ISO 13849-1:2008.
- › The correct function must be checked at regular intervals.
- › Please observe the notes on any enclosed data sheets.

- › Fit escape release such that operation, inspection and service are possible.
- › The actuation axis for the escape release must be inserted min. 10 mm into the handle module. Note the information on the different profile widths in the chapter 7.9.1. *Preparing escape release on page 19.*
- › Align escape release axis at right angles to the handle module. See *Figure 8*.

## 7.9.1. Preparing escape release

| Profile width | Length required for actuation axis |                                  | Which EUCHNER parts are required?                                                                                       | Necessary work steps                                                                                                                                    |
|---------------|------------------------------------|----------------------------------|-------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
|               | Without plates                     | With mounting plates (4 mm each) |                                                                                                                         |                                                                                                                                                         |
| D             | D+13                               | D+21                             |                                                                                                                         |                                                                                                                                                         |
| 30 mm         | 43 mm                              | 51 mm                            | Standard escape release with 110 mm axis (order no. 100465)                                                             | Shorten to required length                                                                                                                              |
| 40 mm         | 53 mm                              | 61 mm                            | Standard escape release with 110 mm axis (order no. 100465)<br>If necessary extended actuation axis (order no. 106761)  | <i>Without mounting plates:</i><br>None<br><i>With mounting plates:</i><br>Use long actuation axis and protective sleeve and shorten to required length |
| 45 mm         | 58 mm                              | 66 mm                            | Standard escape release with 110 mm axis (order no. 100465)<br><b>and</b><br>extended actuation axis (order no. 106761) | Use long actuation axis and protective sleeve and shorten to required length                                                                            |
| 50 mm         | 63 mm                              | 71 mm                            | Standard escape release with 110 mm axis (order no. 100465)<br><b>and</b><br>extended actuation axis (order no. 106761) | Use long actuation axis and protective sleeve and shorten to required length                                                                            |

Example with mounting plates:



- ① Fit door handle.
- ② Insert actuation axis. The locking ring **A** must be in contact with the escape release **B**.
- ③ Tighten setscrew to 2 Nm.
- ④ Fit protective sleeve.

Figure 8: Preparing escape release

## 8. Mounting



### WARNING

Mounting must be performed only by authorized personnel.

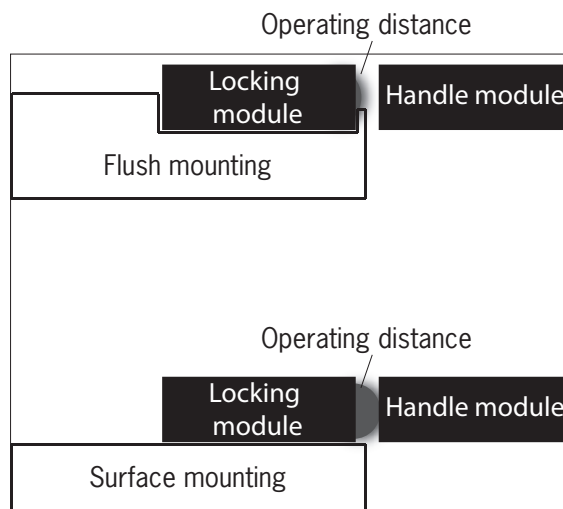
With two-wing hinged doors, one of the two door wings additionally must be latched mechanically.

Use a rod latch (Item) or a double-door lock (Bosch Rexroth) for this purpose, for example.



### Important!

› If installed flush, the switching distance changes as a function of the installation depth and the safety guard material.



### Tip!

› You can find an animation on the mounting process at [www.mgb.euchner.de](http://www.mgb.euchner.de).  
› The color and labeling of pushbuttons and indicators can be modified.

For mounting steps, see *Figure 9* and *Figure 10* to *Figure 15*.

Attach system such that operation of the mechanical release as well as inspection and maintenance are possible.

The locking screw of the escape release must be returned to its original position and sealed before putting into operation (for example with sealing lacquer).

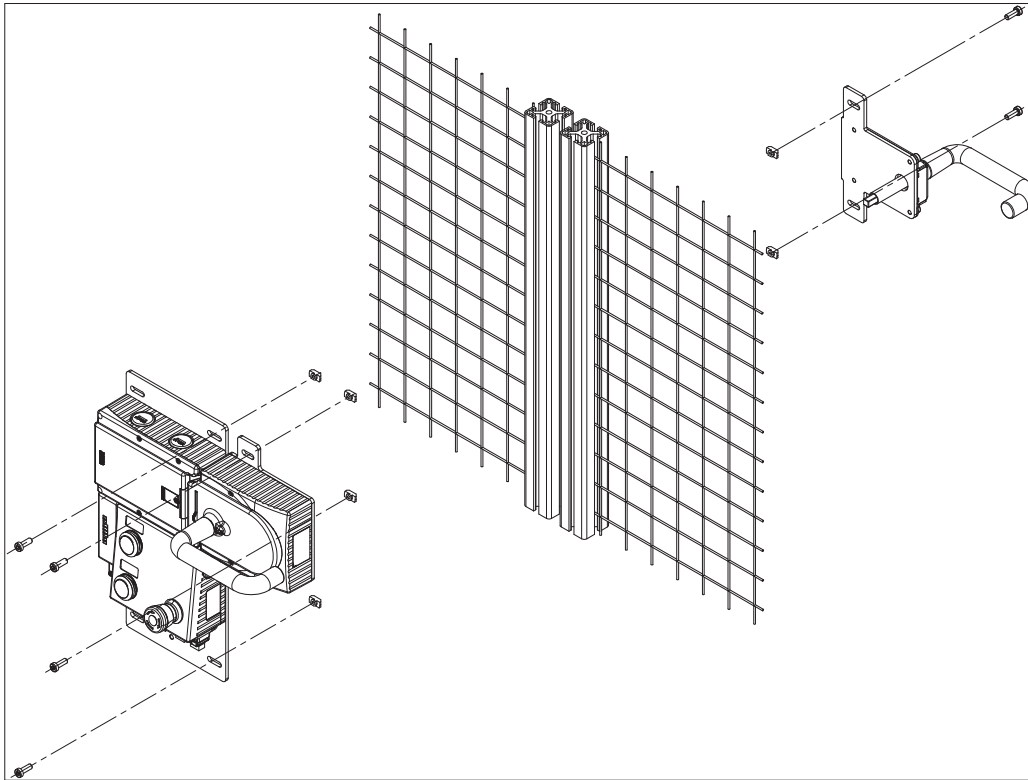
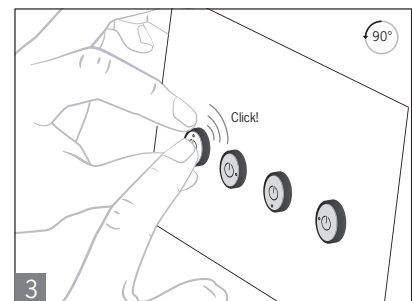
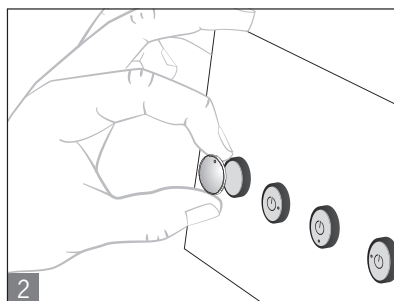
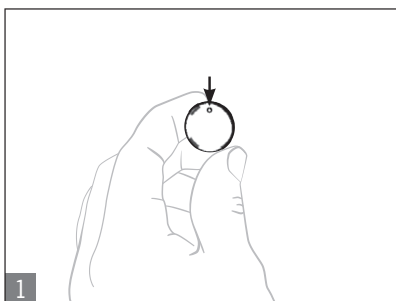


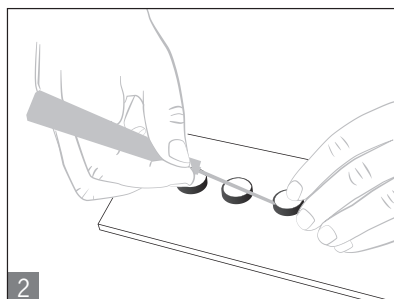
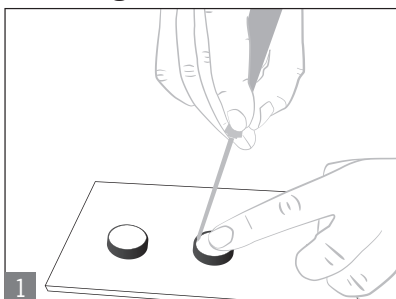
Figure 9: Installation example for door hinged on the right (general view)

## 8.1. Mounting color cover

### Mounting



### Removing



## 9. Changing actuating direction

(here: from right to left)



### Important!

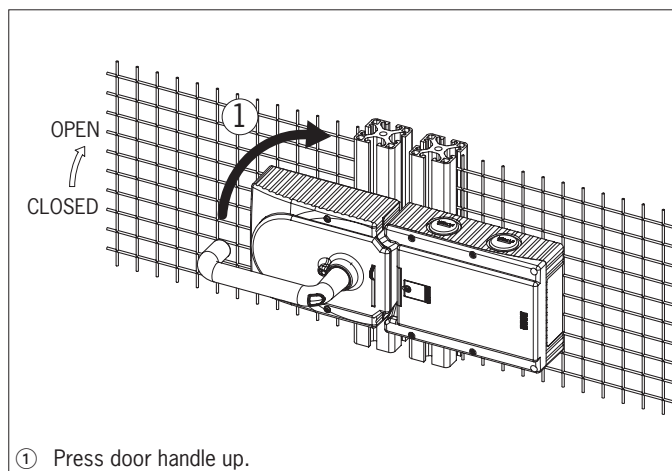
It is only possible to make this change when the bolt tongue is not extended and an escape release is not yet mounted.

As supplied, the handle module is set either for doors hinged on the right or for doors hinged on the left.

Based on the example of a handle module for doors hinged on the right this means:

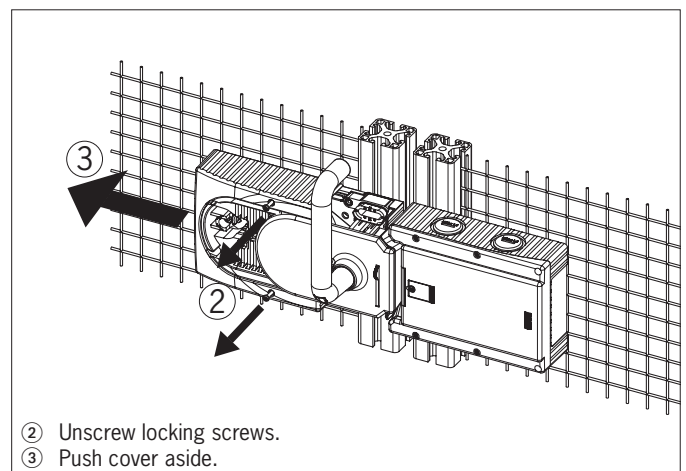
- The safety guard opens by pressing down the door handle.
- The system is mounted the other way around for doors hinged on the left. In other words, the safety door opens by pressing up the door handle (see Figure 10). For this reason the actuating direction of the door handle must be changed (see Figure 10 to Figure 15).

(Similarly on handle modules for doors hinged on the left)



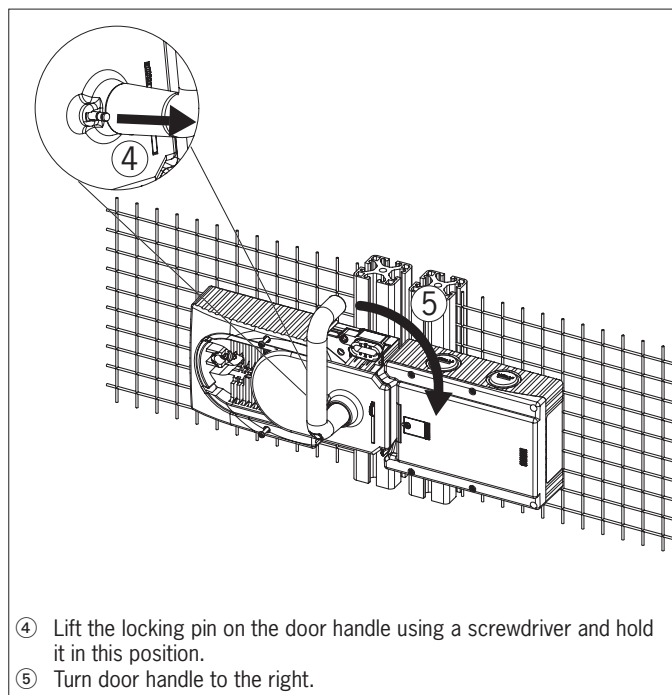
① Press door handle up.

Figure 10: Changing actuating direction, step ①



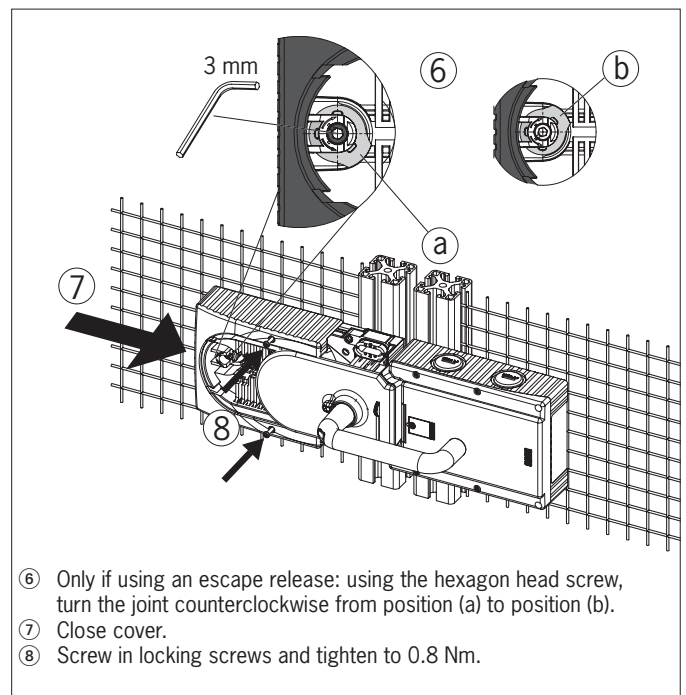
② Unscrew locking screws.  
③ Push cover aside.

Figure 11: Changing actuating direction, steps ② and ③



④ Lift the locking pin on the door handle using a screwdriver and hold it in this position.  
⑤ Turn door handle to the right.

Figure 12: Changing actuating direction, steps ④ and ⑤



⑥ Only if using an escape release: using the hexagon head screw, turn the joint counterclockwise from position (a) to position (b).  
⑦ Close cover.  
⑧ Screw in locking screws and tighten to 0.8 Nm.

Figure 13: Changing actuating direction, steps ⑥ to ⑧

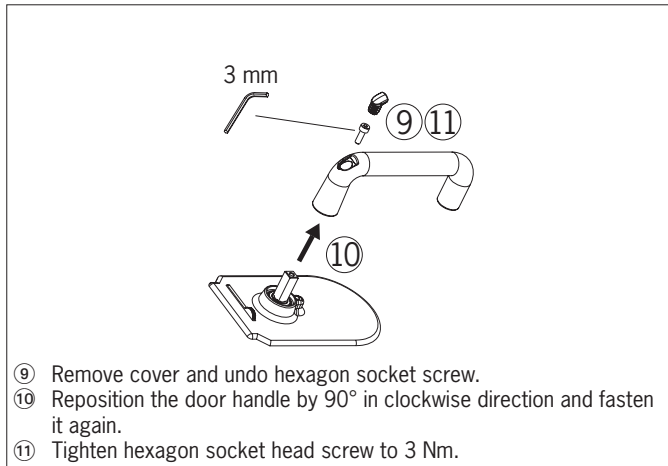


Figure 14: Changing actuating direction, steps ⑨ and ⑪

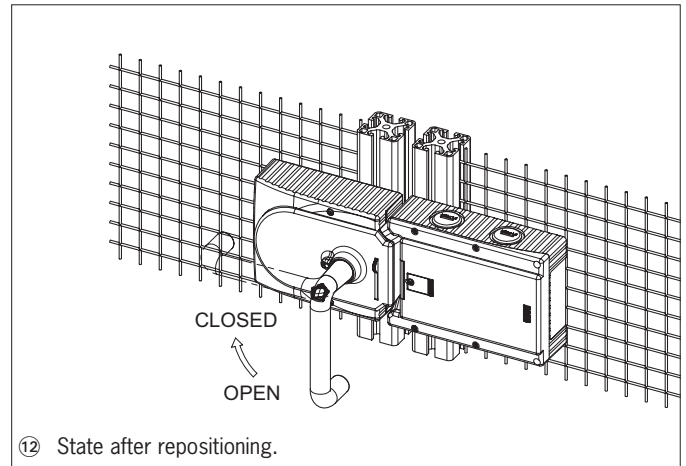


Figure 15: Changing actuating direction, final state

## 10. Protection against environmental effects

Lasting and correct safety function requires that the system must be protected against foreign bodies such as swarf, sand, blasting shot, etc., which can become lodged in the locking and handle modules. For this purpose a suitable installation position should be selected.

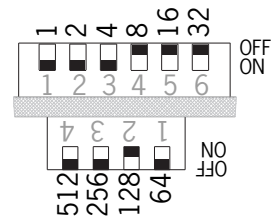
Cover device during painting work!

## 11. Controls and indicators

### LEDs on the bus module

| LED               | Color  | Description                                                                        |
|-------------------|--------|------------------------------------------------------------------------------------|
| Link 1 and Link 2 | Green  | Bus plug inserted: statically on                                                   |
| Data 1 and Data 2 | Yellow | Data transfer: flashing                                                            |
| SF                | Red    | System error: statically on (see chapter on diagnostic messages of the MGB system) |
| BF                | Red    | Bus error: statically on (see chapter on diagnostic messages of the MGB system)    |
| ON                | Green  | Self-test OK: statically on<br>User passivated: flashing                           |
| UB                | Green  | Power supply OK: statically on                                                     |

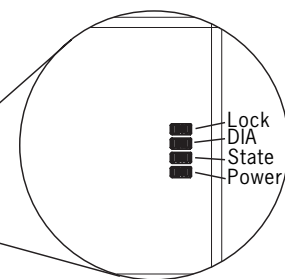
Binary coding of the DIP switches for PROFI-safe address (factory setting: 135)



default address:  
 $128 + 4 + 2 + 1 = 135$

### LEDs on locking/release module

see System status table



Cover for DIP switches

### DIP switches for PROFI-safe address

For coding see above

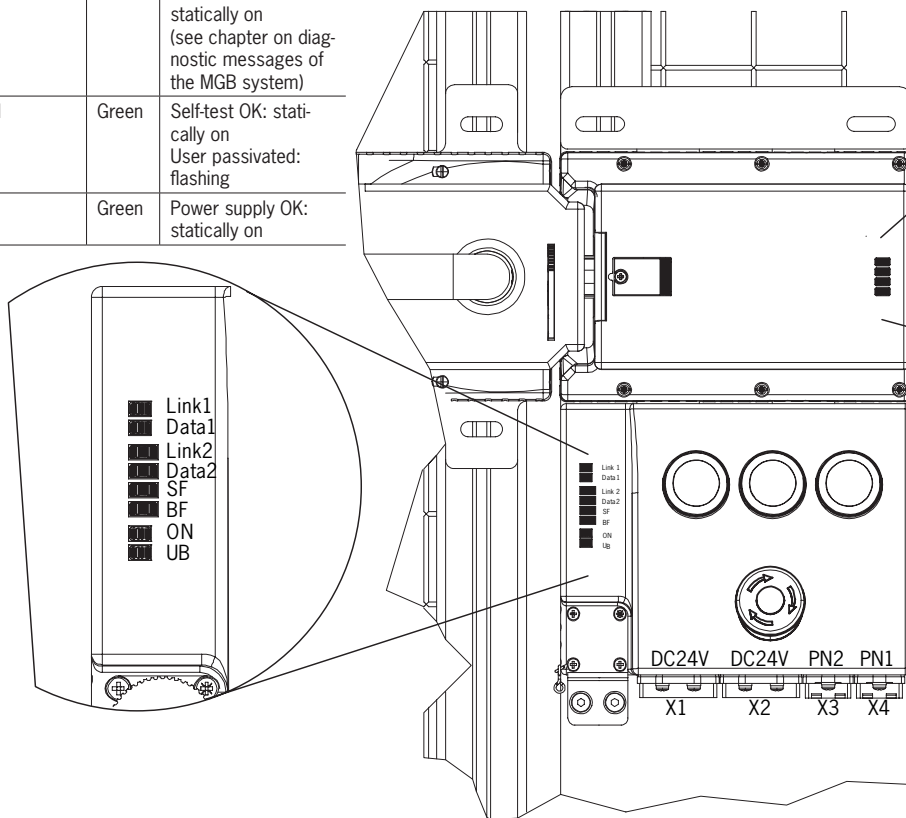
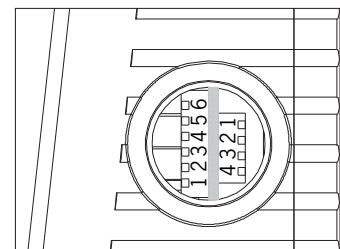


Figure 16: Indicators and controls/binary coding of the DIP switches for PROFI-safe address (factory setting: 135)



## 12. Electrical connection

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p><b>WARNING</b></p> <p>In case of an error, loss of the safety function through incorrect connection.</p> <ul style="list-style-type: none"> <li>› Mounting must be performed only by authorized personnel.</li> <li>› Lay the connection cables with protection to prevent the risk of short circuits.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|  | <p><b>CAUTION</b></p> <p>Risk of damage to equipment or malfunctions as a result of incorrect connection.</p> <ul style="list-style-type: none"> <li>› All the electrical connections must either be isolated from the mains supply by a safety transformer according to EN IEC 61558-2-6 with limited output voltage in the event of a fault, or by other equivalent isolation measures.</li> <li>› Power devices which are a powerful source of interference must be installed in a separate location away from the input and output circuits for signal processing. The cable routing for safety circuits should be as far away as possible from the cables of the power circuits.</li> <li>› In order to avoid EMC interference, follow EMC notes on devices in the immediate vicinity of the MGB system and their cables.</li> <li>› In order to avoid EMC interference, the physical environmental and operating conditions at the installation site of the device must comply with the requirements according to the standard DIN EN 60204-1:2006, section 4.4.2/EMC).</li> <li>› The function earth <math>\text{⚡}</math> must be connected. An M6 threaded bore is available on the mounting plate for this purpose.</li> </ul> |
|  | <p><b>Important!</b></p> <ul style="list-style-type: none"> <li>› The supply for further users on the bus may be forwarded via the Euchner MGB system. The entire supply current through the MGB must not be higher than specified in the chapter 17. <i>Technical data on page 40.</i></li> <li>› If the device does not appear to function when operating voltage is applied (e.g. UB LED does not illuminate), the safety switch must be returned unopened to the manufacturer.</li> <li>› To ensure the stated degree of protection is achieved, the cover screws must be tightened to a tightening torque of 1 Nm.</li> <li>› Tighten screw for the cover for the mechanical release to 0.5 Nm.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

### 12.1. Notes about

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p><b>Important!</b></p> <ul style="list-style-type: none"> <li>› For use and operation as per the  requirements <sup>1)</sup>, a power supply with the feature “for use in class 2 circuits” must be used. The same requirement applies to the safety outputs. Alternative solutions must comply with the following requirements:             <ol style="list-style-type: none"> <li>a) Electrically isolated power supply unit with a max. open-circuit voltage of 30 V/DC and a limited current of max. 8 A.</li> <li>b) Electrically isolated power supply unit in combination with fuse as per UL248. This fuse should be designed for max. 3.3 A and should be integrated into the 30 V DC voltage section.</li> </ol> </li> <li>› The mounting of conduits directly on the MGB is not allowed. Cables are only allowed to be connected via suitable cable glands. For this purpose use EUCHNER cable gland of type EKPM20/06U. Equivalent cable glands can be used if they are UL-listed (QCRV) and are suitable for the related cable diameter (22 AWG – 17 AWG).</li> </ul> <p><small>1) Note on the scope of the UL approval: Only for applications as per NFPA 79 (Industrial Machinery). The devices have been tested as per the requirements of UL508 (protection against electric shock and fire).</small></p> |
|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## 12.2. Connections on bus module

The bus module includes the PROFINET connections (X3 and X4) and the power supply connections (X1 and X2). Depending on the version, connection is made via push-pull plugs according to IEC 61076-3-117, variant 14 or 7/8" plugs according to ANSI/B93.55M-1981 and M12 plugs (d-coded) according to IEC 61076-3-101.

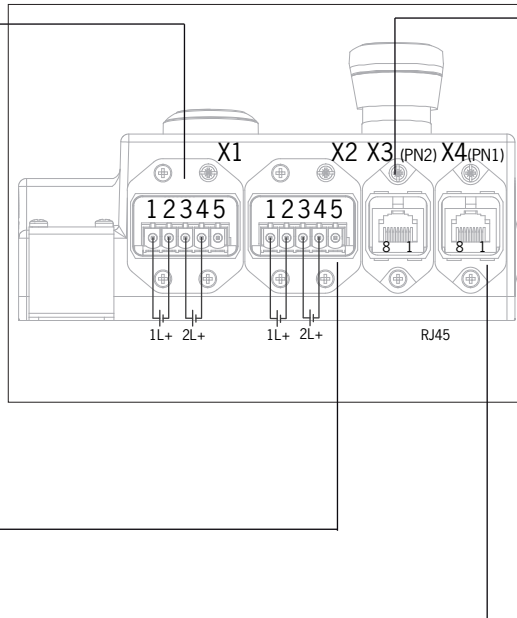
The bus module includes a PROFINET RT switch for Ethernet connection.

### 12.2.1. Terminal assignment for version with push-pull plugs

| Pin  | Description                   |
|------|-------------------------------|
| X1.1 | L1 operating voltage DC 24 V  |
| X1.2 | N1 operating voltage 0 V      |
| X1.3 | L2 auxiliary voltage* DC 24 V |
| X1.4 | N2 auxiliary voltage* 0 V     |
| X1.5 | Function earth                |

\* The auxiliary voltage is not required for the MGB system

| Pin  | Description                   |
|------|-------------------------------|
| X2.1 | L1 operating voltage DC 24 V  |
| X2.2 | N1 operating voltage 0 V      |
| X2.3 | L2 auxiliary voltage* DC 24 V |
| X2.4 | N2 auxiliary voltage* 0 V     |
| X2.5 | Function earth                |



| Pin  | Description       |
|------|-------------------|
| X3.1 | Receive Data RD+  |
| X3.2 | Receive Data RD-  |
| X3.3 | Transmit Data TD+ |
| X3.4 | n.c.              |
| X3.5 | n.c.              |
| X3.6 | Transmit Data TD- |
| X3.7 | n.c.              |
| X3.8 | n.c.              |

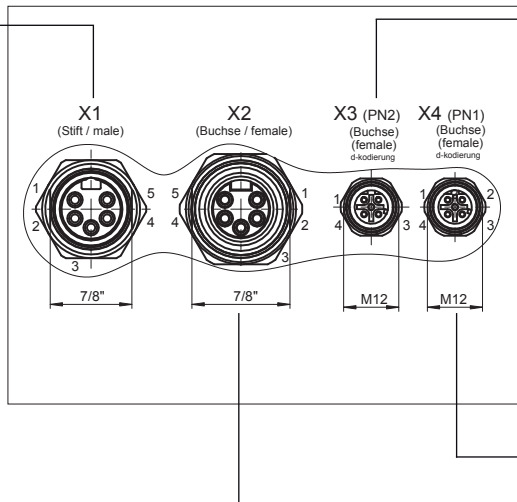
| Pin  | Description       |
|------|-------------------|
| X4.1 | Receive Data RD+  |
| X4.2 | Receive Data RD-  |
| X4.3 | Transmit Data TD+ |
| X4.4 | n.c.              |
| X4.5 | n.c.              |
| X4.6 | Transmit Data TD- |
| X4.7 | n.c.              |
| X4.8 | n.c.              |

### 12.2.2. Terminal assignment for version with 7/8" and M12 plugs, d-coded

| Pin  | Description                   |
|------|-------------------------------|
| X1.1 | N2 auxiliary voltage *0 V     |
| X1.2 | N1 operating voltage 0 V      |
| X1.3 | Function earth                |
| X1.4 | L1 operating voltage DC 24 V  |
| X1.5 | L2 auxiliary voltage* DC 24 V |

\* The auxiliary voltage is not required for the MGB system

| Pin  | Description                   |
|------|-------------------------------|
| X2.1 | N2 auxiliary voltage *0 V     |
| X2.2 | N1 operating voltage 0 V      |
| X2.3 | Function earth                |
| X2.4 | L1 operating voltage DC 24 V  |
| X2.5 | L2 auxiliary voltage* DC 24 V |





| Pin                            | Description         |
|--------------------------------|---------------------|
| X3.1                           | Transmit Data +TD   |
| X3.2                           | Receive Data +RD    |
| X3.3                           | Transmit Data -TD_N |
| X3.4                           | Receive Data -RD_N  |
| Function earth on plug housing |                     |

| Pin                            | Description         |
|--------------------------------|---------------------|
| X4.1                           | Transmit Data +TD   |
| X4.2                           | Receive Data +RD    |
| X4.3                           | Transmit Data -TD_N |
| X4.4                           | Receive Data -RD_N  |
| Function earth on plug housing |                     |

## 13. Setup

### 13.1. Integrating into PROFINET and PROFIsafe

|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p><b>NOTICE</b></p> <p>The parameters “Update time” and “F-WD-Time” have a decisive effect on the reaction time of the safety function. The safety function could be lost if the reaction times are too long.</p>                                                                                                                                                                                                                                                            |
|  | <p><b>Important!</b></p> <p>You will require the corresponding GSD file in GSDML format in order to integrate the MGB system:<br/>           ▶ GSDML-Vx.x-EUCHNER-MGB-PN_D_110026-JJMMTT.xml<br/>           You can find the GSD file in the download area at <a href="http://www.euchner.de">www.euchner.de</a>.<br/>           Prior to commissioning, the GSD file must be imported into the configuration software of the control system (see control system manual).</p> |

You must perform the following steps to integrate the MGB system into PROFINET:

1. Configure the MGB system with the configuration software of the control system and assign parameters.

The following PROFINET parameters must be set:

- ▶ Device name (factory setting from GSD file): [euchnermgb].
- ▶ IP address: optionally fixed or dynamic
- ▶ Update time  
 Recommendation [32 ms]  
 Maximum value [128 ms]  
 (with number of repeat cycles = 3)

The following PROFIsafe parameters must be set:

- ▶ F\_dest\_adr (PROFIsafe address): this is generally assigned automatically by the control system.
- ▶ F\_WD\_Time (time during which the control system expects a response by the PROFIsafe device): [xxx ms]. Factory setting from GSD file: [600 ms]

2. Set the PROFIsafe address (F\_dest\_adr) on the MGB system using the DIP switches (see *Figure 16 on page 24*).  
 Important: Identical addresses must be set in the control system and on the device.
3. Save the configuration and transfer it to the MGB system.

### 13.2. Replacement of an MGB system without programming device

If servicing is required, the MGB system is easy to replace with a new one. For this purpose, the following prerequisites must be met:

- ▶ The DIP switch settings (PROFIsafe address) on the new device must match those on the old device.
- ▶ Your Profinet master must support the automatic replacement of Profinet users.
- ▶ Your Profinet topology must be correctly configured.
- ▶ The replacement device must be connected to the same port as its predecessor.
- ▶ There must be no device name in the MGB system.  
 This field is empty in the as-delivered state. Systems that already contain a name must first be reset to the factory settings.

Once these conditions are met, simply replace the old system with the new system.

The Profinet bus does not need to be switched off for this purpose.

### 13.3. System reset to factory settings

You will find detailed instructions in the manual for the configuration software for your control system.

### 13.4. Teach-in operation (only for MGB unicode)

The handle module must be assigned to the locking module using a teach-in function before the system comprising locking module and handle module and forms a functional unit.

The system is in a safe state (bits SI02, SI03, SI04, SI1.0 and SI1.1 are not set) during a teach-in operation.



#### Important!

- The locking module disables the code for the previous handle module if teach-in is carried out for a new handle module. Teach-in is not possible again immediately for this actuator if a new teach-in operation is carried out. The disabled code is deleted in the locking module only after a third code has been taught.
- The locking module can only be operated with the last handle module taught.
- If, in the teach-in standby state, the locking module detects the handle module taught-in or a disabled handle module, the teach-in standby state is ended immediately and the locking module changes to the normal state.
- If the bolt tongue is in the operating distance for less than 60 s, the handle module is not taught.

#### Teaching in handle module

1. Fit handle module.
2. Close safety guard. Check for correct alignment and distance using the marking on the locking module and re-adjust if necessary.
3. Insert bolt tongue in the locking module.
4. Apply operating voltage to the locking module.
- ➔ Teach-in operation starts, green LED (State) flashes slowly (approx. 1 Hz). The teach-in standby state is active for 3 minutes after switch on. During teach-in, the locking module checks whether the handle module is a disabled handle module. Provided this is not the case, the teach-in operation is ended after approx. 60 seconds, and the green LED (State) goes out. The new code has now been stored, and the old code is disabled.
5. Reset via bit 00.1 in the data block of the diagnostic function to activate the taught-in code of the handle module in the locking module.

### 13.5. Mechanical function test

It must be possible to easily insert the bolt tongue in the locking module. To check, close safety guard several times and actuate door handle.

If available, check function of the escape release. With active guard locking it must be possible to operate the escape release from the inside without excessive effort (approx. 40 N).

### 13.6. Electrical function test

1. Switch the operating voltage on or perform a reset via output bit 00.1 in the data block of the diagnostic function.
2. Close all safety guards and insert the bolt tongue into the locking module.  
In case of guard locking by solenoid force ➔ activate guard locking.
  - The machine must not start automatically.
  - It must not be possible to open the safety guard.
  - **The following applies to MGB-L0:** The green LED (State) is illuminated.
  - **The following applies to MGB-L1/2:** The green LED (State) and the yellow LED (Lock) are illuminated.
3. Enable operation in the control system.
  - It must not be possible to deactivate guard locking as long as operation is enabled.
4. Disable operation in the control system and deactivate guard locking.
  - The safety guard must remain locked until there is no longer any risk of injury.
  - It must not be possible to start the machine as long as the guard locking is deactivated.
  - It must be possible to open the safety guard.

Repeat steps 2-4 for each safety guard.

## 13.7. PROFINET data bytes (data blocks for unsafe functions)

The following modules can be present in various combinations in an MGB system:

- › Bus module MGB-B-...PN (contains everything required for the PROFINET connection)
- › Locking module MGB-L. (forms the door locking mechanism together with the handle module)
- › Control module, MGB-C. (includes various controls/indicators)

Each MGB module occupies a certain number of PROFINET data bytes in the input and output areas of the control system.

The PROFINET data bytes for every MGB module or also individual functions are combined in data blocks (see tables below).

A distinction is made between the following data block types:

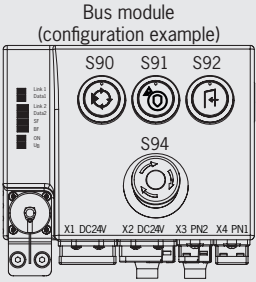
- › Data blocks for MGB modules
- › Data blocks for individual functions

These data blocks are automatically assigned to the designated slots in the configuration software of the control system when your MGB system is placed. This assignment changes according to MGB system. The exact assignment of the slots and the exact bit allocation for your device can be seen in the data sheet. The data sheet is included with every MGB system.

### 13.8. Data blocks for MGB modules

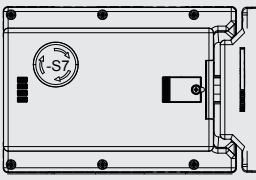
All standard functions of an MGB module are combined in these data blocks. Additional functions, e.g. an optional enabling switch or a stacklight, have separate data ranges (see chapter 13.9. *Data blocks of individual functions at a glance on page 32*).

#### 13.8.1. Data block for MGB bus module

| MGB module                                                                                                                      | Slot                               | Required memory in data range of the control system (IO controller)<br>(refer to the data sheet of your device for the exact bit allocation) |        |         |      |      |      |      |      |      |      |
|---------------------------------------------------------------------------------------------------------------------------------|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|--------|---------|------|------|------|------|------|------|------|
|  <p>Bus module<br/>(configuration example)</p> | See data sheet for slot assignment | Input area<br>(2 bytes)                                                                                                                      | Switch | -       | -    | S95  | S94  | S93  | S92  | S91  | S90  |
|                                                                                                                                 |                                    |                                                                                                                                              | Bit    | I0.7    | I0.6 | I0.5 | I0.4 | I0.3 | I0.2 | I0.1 | I0.0 |
|                                                                                                                                 |                                    | Output area<br>(1 byte)                                                                                                                      |        | Display | H97  | H96  | H95  | H94  | H93  | H92  | H91  |
|                                                                                                                                 |                                    |                                                                                                                                              | Bit    | O0.7    | O0.6 | O0.5 | O0.4 | O0.3 | O0.2 | O0.1 | O0.0 |

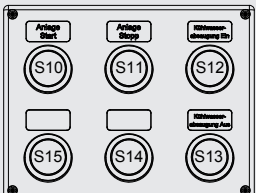
| Bit allocation for 1st byte |      |                                                                                                             |             |     |             |
|-----------------------------|------|-------------------------------------------------------------------------------------------------------------|-------------|-----|-------------|
| Input area                  | Bit  | Description                                                                                                 | Output area | Bit | Description |
|                             | I0.0 | Depends on your configuration variant (refer to the data sheet of your device for the exact bit allocation) |             |     | O0.0        |
| I0.1                        |      |                                                                                                             |             |     |             |
| I0.2                        |      |                                                                                                             |             |     |             |
| I0.3                        |      |                                                                                                             |             |     |             |
| I0.4                        |      |                                                                                                             |             |     |             |
| I0.5                        |      |                                                                                                             |             |     |             |
| I0.6                        |      |                                                                                                             |             |     |             |
| I0.7                        |      |                                                                                                             |             |     |             |
| Bit allocation for 2nd byte |      |                                                                                                             |             |     |             |
| Input area                  | Bit  | Description                                                                                                 |             |     |             |
|                             | I1.0 | Depends on your configuration variant (refer to the data sheet of your device for the exact bit allocation) |             |     |             |
|                             | I1.1 |                                                                                                             |             |     |             |
|                             | I1.2 |                                                                                                             |             |     |             |
|                             | I1.3 |                                                                                                             |             |     |             |
|                             | I1.4 |                                                                                                             |             |     |             |
|                             | I1.5 |                                                                                                             |             |     |             |
|                             | I1.6 |                                                                                                             |             |     |             |
| I1.7                        |      |                                                                                                             |             |     |             |

### 13.8.2. Data block for MGB locking module L0, L1 or L2

| MGB module                                                                                                                     | Slot                               | Required memory in data range of the control system (IO controller)<br>(refer to the data sheet of your device for the exact bit allocation) |         |      |      |      |      |      |      |      |                        |
|--------------------------------------------------------------------------------------------------------------------------------|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|---------|------|------|------|------|------|------|------|------------------------|
| Locking module<br>(configuration example)<br> | See data sheet for slot assignment | Input area<br>(1 byte)                                                                                                                       | Switch  | ÜK   | SK   | -    | -    | -    | Z    | R    | T                      |
|                                                                                                                                |                                    |                                                                                                                                              | Bit     | I0.7 | I0.6 | I0.5 | I0.4 | I0.3 | I0.2 | I0.1 | I0.0                   |
|                                                                                                                                |                                    | Output area<br>(1 byte)                                                                                                                      | Display | -    | -    | -    | -    | -    | -    | -    | Guard locking solenoid |
|                                                                                                                                |                                    |                                                                                                                                              | Bit     | O0.7 | O0.6 | O0.5 | O0.4 | O0.3 | O0.2 | O0.1 | O0.0                   |

| Bit allocation |                    |                   |             |      |                                                                                                                 |
|----------------|--------------------|-------------------|-------------|------|-----------------------------------------------------------------------------------------------------------------|
| Input area     | Bit                | Description       | Output area | Bit  | Description                                                                                                     |
|                | I0.0               | T (door position) |             | O0.0 | Guard locking solenoid – control voltage on (function identical to bit S00.0 => but control from PROFINET area) |
|                | I0.1               | R (bolt position) |             | O0.1 | n.c.                                                                                                            |
|                | I0.2               | Z (guard locking) |             | O0.2 | n.c.                                                                                                            |
|                | I0.3               | n.c.              |             | O0.3 | n.c.                                                                                                            |
|                | I0.4               | n.c.              |             | O0.4 | n.c.                                                                                                            |
|                | I0.5               | n.c.              |             | O0.5 | n.c.                                                                                                            |
|                | I0.6               | SK (T AND R)      |             | O0.6 | n.c.                                                                                                            |
| I0.7           | ÜK (T AND R AND Z) | O0.7              | n.c.        |      |                                                                                                                 |

### 13.8.3. Data block for MGB control module

| MGB module                                                                                                                       | Slot                               | Required memory in data range of the control system (IO controller)<br>(refer to the data sheet of your device for the exact bit allocation) |         |      |      |      |      |      |      |      |      |
|----------------------------------------------------------------------------------------------------------------------------------|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|---------|------|------|------|------|------|------|------|------|
| Control module<br>(configuration example)<br> | See data sheet for slot assignment | Input area<br>(2 bytes)                                                                                                                      | Switch  | S17  | S16  | S15  | S14  | S13  | S12  | S11  | S10  |
|                                                                                                                                  |                                    |                                                                                                                                              | Bit     | I0.7 | I0.6 | I0.5 | I0.4 | I0.3 | I0.2 | I0.1 | I0.0 |
|                                                                                                                                  |                                    | Output area<br>(1 byte)                                                                                                                      | Display | H17  | H16  | H15  | H14  | H13  | H12  | H11  | H10  |
|                                                                                                                                  |                                    |                                                                                                                                              | Bit     | O0.7 | O0.6 | O0.5 | O0.4 | O0.3 | O0.2 | O0.1 | O0.0 |

| Bit allocation for 1st byte |      |                                                                                                             |             |      |                                                                                                             |
|-----------------------------|------|-------------------------------------------------------------------------------------------------------------|-------------|------|-------------------------------------------------------------------------------------------------------------|
| Input area                  | Bit  | Description                                                                                                 | Output area | Bit  | Description                                                                                                 |
|                             | I0.0 | Depends on your configuration variant (refer to the data sheet of your device for the exact bit allocation) |             | O0.0 | Depends on your configuration variant (refer to the data sheet of your device for the exact bit allocation) |
|                             | I0.1 |                                                                                                             |             | O0.1 |                                                                                                             |
|                             | I0.2 |                                                                                                             |             | O0.2 |                                                                                                             |
|                             | I0.3 |                                                                                                             |             | O0.3 |                                                                                                             |
|                             | I0.4 |                                                                                                             |             | O0.4 |                                                                                                             |
|                             | I0.5 |                                                                                                             |             | O0.5 |                                                                                                             |
|                             | I0.6 |                                                                                                             |             | O0.6 |                                                                                                             |
| I0.7                        | O0.7 |                                                                                                             |             |      |                                                                                                             |

| Bit allocation for 2nd byte |      |                                                                                                             |
|-----------------------------|------|-------------------------------------------------------------------------------------------------------------|
| Input area                  | Bit  | Description                                                                                                 |
|                             | I1.0 | Depends on your configuration variant (refer to the data sheet of your device for the exact bit allocation) |
|                             | I1.1 |                                                                                                             |
|                             | I1.2 |                                                                                                             |
|                             | I1.3 |                                                                                                             |
|                             | I1.4 |                                                                                                             |
|                             | I1.5 |                                                                                                             |
|                             | I1.6 |                                                                                                             |
| I1.7                        |      |                                                                                                             |

### 13.9. Data blocks of individual functions at a glance

Function data blocks are required for all additional functions that are not included in the data blocks for MGB modules.

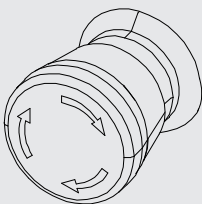
#### 13.9.1. Data block for signal stack module function (optional)

If your MGB system includes this function, the interface to the signal stack module is usually plug connector X6. The following table shows which bit is assigned to which pin of X6. Please refer to the data sheet for any deviations from this.

| Function            | Slot                               | Required memory in data range of the control system (IO controller)<br>(refer to the data sheet of your device for the exact bit allocation) |     |      |      |      |      |      |      |      |      |
|---------------------|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|-----|------|------|------|------|------|------|------|------|
| Signal stack module | See data sheet for slot assignment | Output area<br>(1 byte)                                                                                                                      | Pin | -    | -    | -    | X6.8 | X6.6 | X6.5 | X6.2 | X6.7 |
|                     |                                    |                                                                                                                                              | Bit | 00.7 | 00.6 | 00.5 | 00.4 | 00.3 | 00.2 | 00.1 | 00.0 |

| Bit allocation |      |                            |
|----------------|------|----------------------------|
| Output area    | Bit  | Description                |
|                | 00.0 | Pin 7 on plug connector X6 |
|                | 00.1 | Pin 2 on plug connector X6 |
|                | 00.2 | Pin 5 on plug connector X6 |
|                | 00.3 | Pin 6 on plug connector X6 |
|                | 00.4 | Pin 8 on plug connector X6 |
|                | 00.5 | n.c.                       |
|                | 00.6 | n.c.                       |
| 00.7           | n.c. |                            |

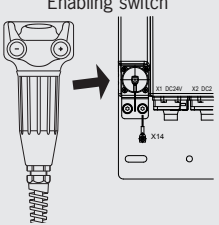
#### 13.9.2. Data block for emergency stop function (optional)

| Function                                                                                              | Slot                               | Required memory in data range of the control system (IO controller)<br>(refer to the data sheet of your device for the exact bit allocation) |                   |      |      |      |      |      |      |      |                   |                |
|-------------------------------------------------------------------------------------------------------|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------|------|------|------|------|------|------|-------------------|----------------|
| Emergency stop<br> | See data sheet for slot assignment | Input area<br>(1 byte)                                                                                                                       | Switching element | -    | -    | -    | -    | -    | -    | -    | Auxiliary contact |                |
|                                                                                                       |                                    |                                                                                                                                              | Bit               | I0.7 | I0.6 | I0.5 | I0.4 | I0.3 | I0.2 | I0.1 | I0.0              |                |
|                                                                                                       |                                    | Output area<br>(1 byte)                                                                                                                      | Display           | -    | -    | -    | -    | -    | -    | -    | -                 | LED (optional) |
|                                                                                                       |                                    |                                                                                                                                              | Bit               | 00.7 | 00.6 | 00.5 | 00.4 | 00.3 | 00.2 | 00.1 | 00.0              |                |

| Bit allocation |      |                                    |  |
|----------------|------|------------------------------------|--|
| Input area     | Bit  | Description                        |  |
|                | I0.0 | Emergency stop auxiliary contact   |  |
|                | I0.1 | n.c.                               |  |
|                | I0.2 | n.c.                               |  |
|                | I0.3 | n.c.                               |  |
|                | I0.4 | n.c.                               |  |
|                | I0.5 | n.c.                               |  |
|                | I0.6 | n.c.                               |  |
| I0.7           | n.c. |                                    |  |
| Output area    | Bit  | Description                        |  |
|                | 00.0 | Emergency stop lighting (optional) |  |
|                | 00.1 | n.c.                               |  |
|                | 00.2 | n.c.                               |  |
|                | 00.3 | n.c.                               |  |
|                | 00.4 | n.c.                               |  |
|                | 00.5 | n.c.                               |  |
|                | 00.6 | n.c.                               |  |
| 00.7           | n.c. |                                    |  |



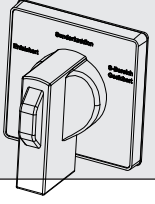
### 13.9.3. Data block for enabling switch function (optional)

| Function                                                                          | Slot                               | Required memory in data range of the control system (IO controller)<br>(refer to the data sheet of your device for the exact bit allocation) |          |        |          |          |      |      |      |              |              |
|-----------------------------------------------------------------------------------|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|----------|--------|----------|----------|------|------|------|--------------|--------------|
|  | See data sheet for slot assignment | Input area (1 byte)                                                                                                                          | Function | Holder | + button | - button | -    | -    | -    | -            | Enabling     |
|                                                                                   |                                    |                                                                                                                                              | Bit      | I0.7   | I0.6     | I0.5     | I0.4 | I0.3 | I0.2 | I0.1         | I0.0         |
|                                                                                   |                                    | Output area (1 byte)                                                                                                                         | Display  | -      | -        | -        | -    | -    | -    | - button LED | + button LED |
|                                                                                   |                                    |                                                                                                                                              | Bit      | O0.7   | O0.6     | O0.5     | O0.4 | O0.3 | O0.2 | O0.1         | O0.0         |

#### Bit allocation

| Input area | Bit                            | Description                                                | Output area                               | Bit  | Description                               |
|------------|--------------------------------|------------------------------------------------------------|-------------------------------------------|------|-------------------------------------------|
|            | I0.0                           | Enabling switch in "enabling" position (auxiliary contact) |                                           | O0.0 | Enabling switch illumination for + button |
| I0.1       | n.c.                           | O0.1                                                       | Enabling switch illumination for - button |      |                                           |
| I0.2       | n.c.                           | O0.2                                                       | n.c.                                      |      |                                           |
| I0.3       | n.c.                           | O0.3                                                       | n.c.                                      |      |                                           |
| I0.4       | n.c.                           | O0.4                                                       | n.c.                                      |      |                                           |
| I0.5       | Enabling switch + button       | O0.5                                                       | n.c.                                      |      |                                           |
| I0.6       | Enabling switch - button       | O0.6                                                       | n.c.                                      |      |                                           |
| I0.7       | Enabling switch stop detection | O0.7                                                       | n.c.                                      |      |                                           |

### 13.9.4. Data block for operating mode selector switch function (optional)

| Function                                                                            | Slot                               | Required memory in data range of the control system (IO controller)<br>(refer to the data sheet of your device for the exact bit allocation) |                          |      |      |      |      |      |      |      |      |
|-------------------------------------------------------------------------------------|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|------|------|------|------|------|------|------|------|
|  | See data sheet for slot assignment | Input area (1 byte)                                                                                                                          | Switch (coding 2 from 3) | -    | -    | -    | -    | -    | -    | S91  |      |
|                                                                                     |                                    |                                                                                                                                              | Bit                      | I0.7 | I0.6 | I0.5 | I0.4 | I0.3 | I0.2 | I0.1 | I0.0 |
|                                                                                     |                                    | Output area (1 byte)                                                                                                                         | Display                  | -    | -    | -    | -    | -    | -    | -    | -    |
|                                                                                     |                                    |                                                                                                                                              | Bit                      | O0.7 | O0.6 | O0.5 | O0.4 | O0.3 | O0.2 | O0.1 | O0.0 |

#### Bit allocation

| Input area | Bit                                  | Description                          | Output area | Bit  | Description |
|------------|--------------------------------------|--------------------------------------|-------------|------|-------------|
|            | I0.0                                 | Operating mode selector switch bit 1 |             | O0.0 | n.c.        |
| I0.1       | Operating mode selector switch bit 2 | O0.1                                 | n.c.        |      |             |
| I0.2       | Operating mode selector switch bit 3 | O0.2                                 | n.c.        |      |             |
| I0.3       | n.c.                                 | O0.3                                 | n.c.        |      |             |
| I0.4       | n.c.                                 | O0.4                                 | n.c.        |      |             |
| I0.5       | n.c.                                 | O0.5                                 | n.c.        |      |             |
| I0.6       | n.c.                                 | O0.6                                 | n.c.        |      |             |
| I0.7       | n.c.                                 | O0.7                                 | n.c.        |      |             |

### 13.9.5. Data block for diagnostic function

| Function    | Slot                               | Required memory in data range of the control system (IO controller)<br>(see below for exact bit allocation) |  |                |  |      |      |                         |                  |                  |                  |              |                               |
|-------------|------------------------------------|-------------------------------------------------------------------------------------------------------------|--|----------------|--|------|------|-------------------------|------------------|------------------|------------------|--------------|-------------------------------|
|             |                                    | Input area<br>(1 byte)                                                                                      |  | Message        |  | Bit  |      | Output area<br>(1 byte) |                  | Acknowledgment   |                  |              |                               |
| Diagnostics | See data sheet for slot assignment | Input area<br>(1 byte)                                                                                      |  | Message        |  | -    | -    | -                       | 272(6)<br>273(6) | 272(2)<br>273(2) | 272(1)<br>273(1) | 274(4)       | -                             |
|             |                                    |                                                                                                             |  | Bit            |  | I0.7 | I0.6 | I0.5                    | I0.4             | I0.3             | I0.2             | I0.1         | I0.0                          |
|             |                                    | Output area<br>(1 byte)                                                                                     |  | Acknowledgment |  | -    | -    | -                       | -                | -                | -                | Reset<br>MGB | Ac-<br>knowl-<br>edg-<br>ment |
|             |                                    |                                                                                                             |  | Bit            |  | O0.7 | O0.6 | O0.5                    | O0.4             | O0.3             | O0.2             | O0.1         | O0.0                          |

| Bit allocation |            |                                                                                                                       |  |             |                                                                                                                                         |  |
|----------------|------------|-----------------------------------------------------------------------------------------------------------------------|--|-------------|-----------------------------------------------------------------------------------------------------------------------------------------|--|
|                | Input area |                                                                                                                       |  | Output area |                                                                                                                                         |  |
|                | Bit        | Description                                                                                                           |  | Bit         | Description                                                                                                                             |  |
|                | I0.0       | Device diagnostics: message present. Diagnostic code: see table of device-specific messages.                          |  | O0.0        | Device diagnostics: acknowledge message, acknowledgment of I0.2, I0.3 or I0.4. I0.0 is also acknowledged if only one message is present |  |
|                | I0.1       | Device diagnostics, device-specific message 274(4) "Plausibility check found an error (e.g. escape release actuated)" |  | O0.1        | Trigger MGB locking module reset: acknowledge message, acknowledgment of I1. I0 is also acknowledged if only one message is present.    |  |
|                | I0.2       | Device diagnostics, device-specific message 272(1) or 273(1) "Fault in emergency stop"                                |  | O0.2        | n.c.                                                                                                                                    |  |
|                | I0.3       | Device diagnostics, device-specific message 272(2) or 273(2) "Fault in enabling switch"                               |  | O0.3        | n.c.                                                                                                                                    |  |
|                | I0.4       | Device diagnostics, device-specific message 272(3,4,5) or 273(3,4,5) "Fault in enabling module"                       |  | O0.4        | n.c.                                                                                                                                    |  |
|                | I0.5       | Device diagnostics, device-specific message 272(6) or 273(6) "Error in operating mode selector switch"                |  | O0.5        | n.c.                                                                                                                                    |  |
|                | I0.6       | n.c.                                                                                                                  |  | O0.6        | n.c.                                                                                                                                    |  |
|                | I0.7       | n.c.                                                                                                                  |  | O0.7        | n.c.                                                                                                                                    |  |

## 13.10. PROFIsafe data bytes (data block for safe functions)

Safe PROFIsafe data are transmitted in addition to the non-safety-related PROFINET data. These data include all information about the door position and guard locking, emergency stop and enabling switch, for example.

The “standard” PROFIsafe data block includes all safe functions. It is subdivided as follows:

- › 2 input bytes of data for the functions (e.g. emergency stop switch position)
- › 2 additional input bytes (empty)
- › 4 input bytes used within PROFIsafe
- › 1 output byte for the functions (e.g. safe control of guard locking)

All data bits are present in parallel in the non-safety-related PROFINET and can be used as signaling bits there.



### **Important!**

Never use the signaling bits for safety functions.

13.10.1. Data block for PROFIsafe



**Important!**

› Refer to the data sheet enclosed with your MGB system for the exact bit allocation. Use only bits that are specified according to the data sheet.

| Function    | Slot                               | Required memory in data range of the control system (IO controller)<br>(see below for exact bit allocation) |  |                                                 |       |       |                                |                   |                   |                   |                 |                |               |
|-------------|------------------------------------|-------------------------------------------------------------------------------------------------------------|--|-------------------------------------------------|-------|-------|--------------------------------|-------------------|-------------------|-------------------|-----------------|----------------|---------------|
| Diagnostics | See data sheet for slot assignment | Input area<br>(6 bytes)                                                                                     |  | Function                                        |       |       | Operating mode selector switch | Guard locking (Z) | Bolt position (R) | Door position (T) | Enabling switch | Emergency stop |               |
|             |                                    |                                                                                                             |  | 1st byte                                        | SI0.7 | SI0.6 | SI0.5                          | SI0.4             | SI0.3             | SI0.2             | SI0.1           | SI0.0          |               |
|             |                                    |                                                                                                             |  | Function                                        |       | -     | -                              | -                 | -                 | -                 | -               | ÜK             | SK            |
|             |                                    |                                                                                                             |  | 2nd byte                                        | SI1.7 | SI1.6 | SI1.5                          | SI1.4             | SI1.3             | SI1.2             | SI1.1           | SI1.0          |               |
|             |                                    | Function                                                                                                    |  |                                                 |       |       |                                |                   |                   |                   |                 |                |               |
|             |                                    | 3rd - 6th bytes                                                                                             |  | Used within PROFIsafe (control byte, CRC, etc.) |       |       |                                |                   |                   |                   |                 |                |               |
|             |                                    | Output area<br>(6 bytes)                                                                                    |  | Function                                        |       | -     | -                              | -                 | -                 | -                 | -               | -              | Guard locking |
|             |                                    |                                                                                                             |  | 1st byte                                        | SO0.7 | SO0.6 | SO0.5                          | SO0.4             | SO0.3             | SO0.2             | SO0.1           | SO0.0          |               |
|             |                                    |                                                                                                             |  | Function                                        |       | -     | -                              | -                 | -                 | -                 | -               | -              | -             |
|             |                                    |                                                                                                             |  | 2nd byte                                        | SO1.7 | SO1.6 | SO1.5                          | SO1.4             | SO1.3             | SO1.2             | SO1.1           | SO1.0          |               |
|             |                                    | Function                                                                                                    |  |                                                 |       |       |                                |                   |                   |                   |                 |                |               |
|             |                                    | 3rd - 6th bytes                                                                                             |  | Used within PROFIsafe (control byte, CRC, etc.) |       |       |                                |                   |                   |                   |                 |                |               |

**Bit allocation for 1st byte**

|       | Bit        | Description                                                                                                              |       | Bit            | Description |
|-------|------------|--------------------------------------------------------------------------------------------------------------------------|-------|----------------|-------------|
|       | Input area | SI0.0                                                                                                                    |       | Emergency stop | Output area |
| SI.01 |            | Enabling switch<br>Enabling contacts closed (three-stage enabling switch in center position), no evaluation of the edges | SO0.1 | n.c.           |             |
| SI0.2 |            | Door position (T)                                                                                                        | SO0.2 | n.c.           |             |
| SI0.3 |            | Bolt position (R)                                                                                                        | SO0.3 | n.c.           |             |
| SI0.4 |            | Guard locking (Z)                                                                                                        | SO0.4 | n.c.           |             |
| SI0.5 |            | Operating mode selector switch, 1st bit                                                                                  | SO0.5 | n.c.           |             |
| SI0.6 |            | Operating mode selector switch, 2nd bit                                                                                  | SO0.6 | n.c.           |             |
| SI0.7 |            | Operating mode selector switch, 3rd bit                                                                                  | SO0.7 | n.c.           |             |

**Bit allocation for 2nd byte**

|       | Bit        | Description                             |       | Bit          | Description |
|-------|------------|-----------------------------------------|-------|--------------|-------------|
|       | Input area | SI1.0                                   |       | SK (T AND R) | Output area |
| SI1.1 |            | ÜK (T AND R AND Z)                      | SO1.1 | n.c.         |             |
| SI1.2 |            | n.c.                                    | SO1.2 | n.c.         |             |
| SI1.3 |            | n.c.                                    | SO1.3 | n.c.         |             |
| SI1.4 |            | n.c.                                    | SO1.4 | n.c.         |             |
| SI1.5 |            | n.c.                                    | SO1.5 | n.c.         |             |
| SI1.6 |            | n.c.                                    | SO1.6 | n.c.         |             |
| SI1.7 |            | Reserved for customer-specific function | SO1.7 | n.c.         |             |

## 14. Diagnostic messages of the MGB system

All diagnostic messages are listed below. The scope of the possible messages can differ according to the MGB system version.

### PROFIsafe messages

Display via LED BF (see Figure 16)

| No. | Description                                                         | Measures/remedying errors                                                                                          |
|-----|---------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|
| 64  | Error when comparing the PROFIsafe destination address (F_Dest_Add) | 1. Check DIP switch setting<br>2. Restart system                                                                   |
| 65  | Invalid PROFIsafe destination address (F_Dest_Add)                  | 1. Check addressing<br>2. Restart system                                                                           |
| 66  | Invalid PROFIsafe source address (F_Source_Add)                     | 1. Check addressing<br>2. Restart system                                                                           |
| 67  | Value for the PROFIsafe time monitoring is 0 ms (F_WD_TIME)         | 1. Check system times<br>2. Restart system                                                                         |
| 68  | Parameter F_SIL exceeds SIL of the device-specific application      | 1. Check settings<br>2. Restart system                                                                             |
| 69  | Parameter F_CRC_Length does not match the generated values          | 1. Check settings<br>2. Restart system                                                                             |
| 70  | Version for F_Parameter not correct                                 | 1. Check configuration<br>2. Restart system                                                                        |
| 71  | Error CRC 1- (during booting)                                       | 1. Restart system                                                                                                  |
| 72  | Device-specific diagnostic information (see following table)        | 1. Identify error via input bit I0.0<br>2. For error remedy, see the following table with device-specific messages |

### Device-specific diagnostic information

Display via LED SF (see Figure 16)

#### Discrepancy error (two-channel monitoring detected an error)

##### Notice:

- ▶ The discrepancy time is the maximum time during which channel 1 and channel 2 may have different signal states.
- ▶ If acknowledgment was unsuccessful, send the device to the manufacturer.

| No.    | Description                                              | Measures/remedying errors                                               |
|--------|----------------------------------------------------------|-------------------------------------------------------------------------|
| 272    | Discrepancy time exceeded                                | 1. Search for cause<br>2. Acknowledge fault (via output bit 00.0)       |
| 272(1) | Emergency-stop discrepancy time exceeded                 | 1. Press emergency stop<br>2. Acknowledge fault (via output bit 00.0)   |
| 272(3) | Door position discrepancy time exceeded                  | 1. Open the door<br>2. Acknowledge fault (via output bit 00.0)          |
| 272(4) | Bolt-position discrepancy time exceeded                  | 1. Open the door<br>2. Acknowledge fault (via output bit 00.0)          |
| 272(5) | Guard-locking discrepancy time exceeded                  | 1. Open the door<br>2. Acknowledge fault (via output bit 00.0)          |
| 272(6) | Operating mode selector switch discrepancy time exceeded | 1. Search for cause<br>2. Acknowledge fault (via output bit 00.0)       |
| 272(7) | Enabling switch detection discrepancy time exceeded      | 1. Remove enabling switch<br>2. Acknowledge fault (via output bit 00.0) |
| 272(8) | Internal device error                                    | Please contact our support organization!                                |

#### Test-pulse error (short-circuit monitoring detected an error)

##### Notice:

- ▶ The emergency stop must **not** be pressed during acknowledgment.
- ▶ If acknowledgment was unsuccessful, send the device to the manufacturer.

| No.    | Description                                           | Measures/remedying errors                                                                                                                             |
|--------|-------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| 273    | Test pulses erroneous                                 | Safety function is switched off while no test pulses are being detected.<br>1. Check system<br>2. Acknowledgment via output bit 00.0 required.        |
| 273(1) | Emergency-stop test pulses erroneous                  | Safety function is switched off while no test pulses are being detected.<br>1. Check system<br>2. Acknowledgment via output bit 00.0 required.        |
| 273(3) | Door-position test pulses erroneous                   | Safety function is switched off while no test pulses are being detected.<br>1. Close door<br>2. Acknowledgment via output bit 00.0 required.          |
| 273(4) | Bolt-position test pulses erroneous                   | Safety function is switched off while no test pulses are being detected.<br>1. Close door<br>2. Acknowledgment via output bit 00.0 required.          |
| 273(5) | Guard-locking test pulses erroneous                   | Safety function is switched off while no test pulses are being detected.<br>1. Close and lock door<br>2. Acknowledgment via output bit 00.0 required. |
| 273(6) | Operating mode selector switch test pulses erroneous. | Safety function is switched off while no test pulses are being detected.<br>1. Check system<br>2. Acknowledgment via output bit 00.0 required.        |
| 273(7) | Enabling-switch detection test pulses erroneous       | Safety function is switched off while no test pulses are being detected.<br>1. Check system<br>2. Acknowledgment via output bit 00.0 required.        |
| 273(8) | Internal device error                                 | Please contact our support organization!                                                                                                              |

### General messages of the overall system

| No.    | Description                                                        | Measures/remedying errors                                                                                                                                      |
|--------|--------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 274(2) | Internal device error                                              | Please contact our support organization!                                                                                                                       |
| 274(3) | Signal sequence erroneous (e.g. broken bolt tongue recognized)     | 1. Check mech. functions<br>2. Acknowledge fault (via output bit 00.1). The safety door must be open.                                                          |
| 274(4) | Plausibility test detected an error (e.g. escape release actuated) | Important: The resetting procedure is contained in the section "Latching fault when actuating the escape release"<br>► Acknowledge fault (via output bit 00.1) |
| 274(5) | Locking module in error                                            | Please contact our support organization!                                                                                                                       |
| 274(6) | Internal device error                                              | Please contact our support organization!                                                                                                                       |
| 274(7) | Internal device error                                              |                                                                                                                                                                |
| 274(8) | Internal device error                                              |                                                                                                                                                                |

### Fault in operating mode selector switch

| No.    | Description                  | Measures/remedying errors                |
|--------|------------------------------|------------------------------------------|
| 275(1) | Plausibility check erroneous | Please contact our support organization! |
| 275(2) | Internal device error        |                                          |
| 275(3) | Internal device error        |                                          |
| 275(4) | Internal device error        |                                          |
| 275(5) | Internal device error        |                                          |
| 275(6) | Internal device error        |                                          |
| 275(7) | Internal device error        |                                          |
| 275(8) | Internal device error        |                                          |

### PROFIsafe errors

| No.    | Description              | Measures/remedying errors                |
|--------|--------------------------|------------------------------------------|
| 276(1) | Starting error PROFIsafe | Please contact our support organization! |
| 276(2) | Memory error RAM         |                                          |
| 276(3) | Memory error FLASH       |                                          |
| 276(4) | Communication error      |                                          |
| 276(5) | Synchronization error    |                                          |
| 276(6) | Voltage monitoring       |                                          |
| 276(7) | Internal device error    |                                          |
| 276(8) | Hardware fault           |                                          |

### General messages of the overall system

| No.    | Description            | Measures/remedying errors                |
|--------|------------------------|------------------------------------------|
| 277(1) | Starting error MGB     | Please contact our support organization! |
| 277(2) | Communication error    |                                          |
| 277(3) | Internal device error  |                                          |
| 277(4) | Wrong software version |                                          |
| 277(5) | Internal device error  |                                          |
| 277(6) | Internal device error  |                                          |
| 277(7) | Internal device error  |                                          |
| 277(8) | Internal device error  |                                          |

| No.    | Description                     | Measures/remedying errors                |
|--------|---------------------------------|------------------------------------------|
| 278(1) | Solenoid control fault          | Please contact our support organization! |
| 278(2) | Fault in switch element CPU A   |                                          |
| 278(3) | Fault in switch element CPU B   |                                          |
| 278(4) | Timeout of switch element CPU A |                                          |
| 278(5) | Timeout of switch element CPU B |                                          |
| 278(6) | Internal device error           |                                          |
| 278(7) | Internal device error           |                                          |
| 278(8) | Internal device error           |                                          |

### Cyclical Profisafe status message

| Bit | Description                           | Measures/remedying errors                                                                                              |
|-----|---------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| 0   | Reserved                              | -                                                                                                                      |
| 1   | Error in F-Device or F-Module         | User is passivated (on LED flashes). You will find information on depassivating in the manual for your control system. |
| 2   | Communication error, CRC error        |                                                                                                                        |
| 3   | Communication error, watchdog timeout | -                                                                                                                      |
| 4   | Fail-safe values activated            | -                                                                                                                      |
| 5   | Toggle bit                            | -                                                                                                                      |
| 6   | Consecutive number was reset          | -                                                                                                                      |
| 7   | Reserved                              | -                                                                                                                      |

## 15. PROFINET alarms

### 15.1. Fault in stacklight module

Short circuits on the stacklight module are output as a PROFINET diagnostic alarm (alarm number 1: short circuit).

## 16. System status table

### LEDs on interlocking/locking module

| Operating mode                                      | Door position | Position of the bolt tongue | Guard locking | Door position input bit S10.2 | Bolt position input bit S10.3 | Guard locking input bit S10.4 | UK input bit S11.1 | Device diagnostics input bit I0.0 | Device diagnostics input bit I0.1 | Device diagnostics input bit I0.7 | POWER (gn) | LED indicator     |                            |          | State                                                                                                                   |
|-----------------------------------------------------|---------------|-----------------------------|---------------|-------------------------------|-------------------------------|-------------------------------|--------------------|-----------------------------------|-----------------------------------|-----------------------------------|------------|-------------------|----------------------------|----------|-------------------------------------------------------------------------------------------------------------------------|
|                                                     |               |                             |               |                               |                               |                               |                    |                                   |                                   |                                   |            | STATE (gn)        | Lock (Ye), only MGB-L1/-L2 | DIA (rd) |                                                                                                                         |
| <b>Normal operation</b>                             | open          | not inserted                | off           | off                           | off                           | off                           | off                | off                               | off                               | X                                 |            | long OFF short ON | ○                          | ○        | Normal operation, door open                                                                                             |
|                                                     | closed        | not inserted                | off           | on                            | off                           | off                           | off                | off                               | off                               | X                                 |            | long ON short OFF | ○                          | ○        | Normal operation, door closed                                                                                           |
|                                                     | closed        | inserted                    | off           | on                            | off                           | off                           | off                | off                               | off                               | X                                 |            | long ON short OFF | ☀                          | ○        | Normal operation, door closed, bolt tongue inserted                                                                     |
|                                                     | closed        | inserted                    | on            | on                            | on                            | on                            | off                | off                               | off                               | X                                 |            |                   | ☀                          | ○        | Normal operation, door closed and locked                                                                                |
| <b>Teach-in standby</b><br>(only for MGB unit-code) | open          | not inserted                | off           | off                           | off                           | off                           | off                | off                               | off                               | X                                 | ☀          | 3 x               | ○                          | ○        | Door open; unit is ready for teach-in for another handle module (only short time after power-up)                        |
|                                                     | closed        | inserted                    | on            | off                           | on                            | on                            | off                | off                               | off                               | X                                 |            | 1 Hz              | ○                          | ○        | Teach-in operation                                                                                                      |
| <b>Setup</b><br>(only for MGB unit-code)            | X             | X                           | X             | off                           | off                           | off                           | off                | off                               | off                               | X                                 |            |                   | ○                          | ○        | Positive acknowledgment after completion of teach-in operation                                                          |
|                                                     | X             | X                           | X             | off                           | off                           | off                           | off                | on                                | off                               | X                                 |            | 3 x               | ○                          | ○        | Handle module read error (e.g. error in code or code cannot be read)**                                                  |
|                                                     | X             | X                           | X             | off                           | off                           | off                           | off                | on                                | off                               | X                                 |            |                   | ○                          | ○        | Internal fault (e.g. component faulty, data error)*                                                                     |
|                                                     | X             | X                           | X             | off                           | off                           | off                           | off                | on                                | off                               | X                                 |            |                   | ☀                          | 1 x      | Signal sequence incorrect, e.g. broken bolt tongue recognized*** or after actuation of the escape release, for example* |
| <b>Fault display</b>                                |               |                             |               |                               |                               |                               |                    |                                   |                                   |                                   |            |                   |                            |          | LED not illuminated                                                                                                     |
|                                                     |               |                             |               |                               |                               |                               |                    |                                   |                                   |                                   |            |                   |                            |          | LED illuminated                                                                                                         |
|                                                     |               |                             |               |                               |                               |                               |                    |                                   |                                   |                                   |            |                   |                            |          | LED flashes for 8 seconds at 10 Hz                                                                                      |
| <b>Key to symbols</b>                               |               |                             |               |                               |                               |                               |                    |                                   |                                   |                                   |            |                   |                            |          | LED flashes three times                                                                                                 |
|                                                     |               |                             |               |                               |                               |                               |                    |                                   |                                   |                                   |            |                   |                            |          | Any state                                                                                                               |

\* Latching fault; use corresponding output bit to reset (see chapter 14. Diagnostic messages of the MGB system on page 37)

\*\* Non-latching fault; open safety guard and close it again to reset

\*\*\* Latching fault; use corresponding output bit to reset; door must be open (see chapter 14. Diagnostic messages of the MGB system on page 37)

**Important:** If you do not find the displayed device status in the System status table, this indicates an internal device fault. In this case, you should contact the manufacturer.

## 17. Technical data



### NOTICE

If a product data sheet is included with the product, the information on the data sheet applies.

| Parameter                                                                             | Value                                                                                                                                   |
|---------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| $s_{ar}$ max. door position                                                           | 65 mm                                                                                                                                   |
| Housing material                                                                      | Fiber glass reinforced plastic;<br>die-cast zinc, nickel-plated;<br>stainless steel;<br>powder-coated sheet steel                       |
| Dimensions                                                                            | See dimension drawing                                                                                                                   |
| Weight of MGB-L.B (bus module, locking module, and button module with mounting plate) | 4.05 kg                                                                                                                                 |
| Weight of handle module with mounting plate                                           | 1.20 kg                                                                                                                                 |
| Weight of escape release module with mounting plate                                   | 1.15 kg                                                                                                                                 |
| Ambient temperature                                                                   | -20 ... +55 °C                                                                                                                          |
| Degree of protection                                                                  | IP 54                                                                                                                                   |
| Safety class                                                                          | III                                                                                                                                     |
| Degree of contamination                                                               | 3                                                                                                                                       |
| Installation position                                                                 | Any                                                                                                                                     |
| Locking force $F_{zh}$ in accordance with GS-ET-19                                    | 2,000 N                                                                                                                                 |
| Connection options, power supply                                                      | 2 x push-pull power <sup>1)</sup><br>or 2 x plug connectors 7/8" according to ANSI/B93.55M-1981                                         |
| Connection type, bus                                                                  | 2 x RJ 45, push-pull, according to IEC 61076-3-117 type 14, screened <sup>1)</sup><br>or 2 x M12 (d-coded) according to IEC 61076-2-101 |
| Connection cable, bus                                                                 | Profinet I/O cable, at least cat. 5e                                                                                                    |
| Operating voltage $U_B$                                                               | DC 24 V +10% / -15%<br>(PELV – see chapter 12. <i>Electrical connection on page 25</i> )                                                |
| Current consumption, max.                                                             | 500 mA                                                                                                                                  |
| Max. feed-in current in the connection block (push-pull plug connector)               | 4,000 mA                                                                                                                                |
| Fuse protection for power supply, external                                            | Min. 1 A slow-blow                                                                                                                      |
| Safety outputs                                                                        | Profisafe according to IEC 61784-3-3                                                                                                    |
| Rated insulation voltage $U_i$                                                        | 75 V                                                                                                                                    |
| Rated impulse withstand voltage $U_{imp}$                                             | 0.5 kV                                                                                                                                  |
| Resilience to vibration and shock                                                     | According to EN 60947-5-3                                                                                                               |
| EMC protection requirements                                                           | According to EN 61000-4<br>and DIN EN 61326-3-1                                                                                         |
| Switching frequency max.                                                              | 1 Hz                                                                                                                                    |
| Risk times max. (switch-off times) <sup>2)</sup>                                      |                                                                                                                                         |
| - Emergency stop                                                                      | 220 ms                                                                                                                                  |
| - Enabling switch                                                                     | 220 ms                                                                                                                                  |
| - Operating mode selector switch                                                      | 220 ms                                                                                                                                  |
| - Door position                                                                       | 550 ms                                                                                                                                  |
| - Bolt position                                                                       | 550 ms                                                                                                                                  |
| - Guard locking                                                                       | 550 ms                                                                                                                                  |
| <b>Reliability values acc. to EN ISO 13849-1</b>                                      |                                                                                                                                         |
| Category                                                                              | 4 (EN 13849-1:2008-12)                                                                                                                  |
| Performance Level                                                                     | PL e (EN 13849-1:2008-12)                                                                                                               |
| MTTF <sub>d</sub> <sup>3)</sup>                                                       | 91 years                                                                                                                                |
| DC                                                                                    | 99%                                                                                                                                     |
| Mission time                                                                          | 20 years                                                                                                                                |
| PFH <sub>d</sub> <sup>3)</sup>                                                        |                                                                                                                                         |
| - Monitoring of guard locking                                                         | 4.07 x 10 <sup>-8</sup>                                                                                                                 |
| - Control of guard locking                                                            | 3.91 x 10 <sup>-8</sup>                                                                                                                 |
| - Evaluation of emergency stop, enabling switch, selector switch                      | 4.10 x 10 <sup>-8</sup>                                                                                                                 |
| $B_{10d}$ <sup>4)</sup>                                                               |                                                                                                                                         |
| - Emergency stop                                                                      | 1 x 10 <sup>5</sup>                                                                                                                     |
| - Enabling switch                                                                     | According to manufacturer's specifications                                                                                              |

1) The document *PROFINET Cabling and Interconnection Technology* from the PNO aids in the correct selection of wiring.

2) The risk time is the max. time between the change in the input status and the deletion of the corresponding bit in the bus protocol.

3) Fixed failure rate without consideration of faults in wearing parts.

4) Information regarding wearing parts without consideration of fixed failure rates in electronic components.



## 18. Troubleshooting and assistance

### 18.1. Latching fault when actuating the escape release

In order to achieve monitoring of the locking device in category 4, PL e according to EN ISO 13849-1, an internal monitoring logic system is integrated into every locking module.

**Result:** The MGB system enters into a latching fault when the escape release is actuated (refer to the 16. System status table on page 39).

| Door position | Position of the bolt tongue | Guard locking | Door position input bit SIO.2 | Bolt position input bit SIO.3 | Guard locking input bit SIO.4 | ÜK input bit SI1.1 | Device diagnostics input bit IO.0 | Device diagnostics input bit IO.1 | Device diagnostics input bit IO.7 | LED indicator |            |           |          | State                                                                   |
|---------------|-----------------------------|---------------|-------------------------------|-------------------------------|-------------------------------|--------------------|-----------------------------------|-----------------------------------|-----------------------------------|---------------|------------|-----------|----------|-------------------------------------------------------------------------|
|               |                             |               |                               |                               |                               |                    |                                   |                                   |                                   | Power (gn)    | State (gn) | Lock (ye) | DIA (rd) |                                                                         |
| X             | X                           | X             | off                           | off                           | off                           | off                | on                                | on                                | X                                 |               |            |           | 1 x      | Signal sequence incorrect (e.g. after actuation of the escape release)* |
|               |                             |               |                               |                               |                               |                    |                                   |                                   |                                   |               |            |           |          | LED not illuminated                                                     |
|               |                             |               |                               |                               |                               |                    |                                   |                                   |                                   |               |            |           |          | LED illuminated                                                         |
|               |                             |               |                               |                               |                               |                    |                                   |                                   |                                   |               |            |           |          | LED flashes for 8 seconds at 10 Hz                                      |
|               |                             |               |                               |                               |                               |                    |                                   |                                   |                                   |               |            |           |          | LED flashes three times                                                 |
|               |                             |               |                               |                               |                               |                    |                                   |                                   |                                   | X             |            |           |          | Any state                                                               |



#### NOTICE

The system might not enter into a latching fault if the escape release is actuated very slowly.

### 18.2. Fault reset

Proceed as follows:

1. Acknowledge fault via output bit OO.1 (in data block for diagnostics function).
  2. Close safety guard if necessary and switch guard locking on.
- ➔ The system is in normal mode again.

### 18.3. Help on troubleshooting on the Internet

You will find a help file on troubleshooting under "Support" in the service area at [www.euchner.de](http://www.euchner.de).

### 18.4. Help on mounting on the Internet

You will find an animation on the mounting process at [www.euchner.de](http://www.euchner.de).

### 18.5. Application examples

You will find application examples on connecting the device to various control systems at [www.euchner.de](http://www.euchner.de).

## 19. Service

If service support is required, please contact:

EUCHNER GmbH + Co. KG  
Kohlhammerstraße 16  
D-70771 Leinfelden-Echterdingen

**Service telephone:**

+49 711 7597-500

**E-mail:**

support@euchner.de

**Internet:**

www.euchner.de

## 20. Inspection and service



**WARNING**

Loss of the safety function because of damage to the system.  
In case of damage, the affected module must be replaced completely. Only accessories or spare parts that can be ordered from EUCHNER may be replaced.

Regular inspection of the following is necessary to ensure trouble-free long-term operation:

- › Check the switching function (see section 13.6. *Electrical function test on page 28*)
- › Check the secure fastening of the devices and the connections
- › Check for soiling

No servicing is required; repairs to the device are only allowed to be made by the manufacturer.



**NOTICE**

The year of manufacture can be seen in the lower right corner of the rating plate.

## 21. Declaration of conformity

More than safety.



# EUCHNER

**EUCHNER GmbH + Co. KG**  
Kohlhammerstraße 16  
70771 Leinfelden-Echterdingen  
Germany

**EG-Konformitätserklärung**  
**EC-Declaration of Conformity**  
**CE-Déclaration de Conformité**  
**CE-Dichiarazione di conformità**  
**CE-Declaración de conformidad**

Original DE  
Translation EN  
Traduction FR  
Traduzione IT  
Traducción ES

123624-02-02/15

Die nachfolgend aufgeführten Produkte sind konform mit den Anforderungen der folgenden Richtlinien (falls zutreffend):  
*The beneath listed products are in conformity with the requirements of the following directives (if applicable):*  
*Les produits mentionnés ci-dessous sont conformes aux exigences imposées par les directives suivantes (si valable)*  
*I prodotti sotto elencati sono conformi alle direttive sotto riportate (dove applicabili):*  
*Los productos listados a continuación son conforme a los requisitos de las siguientes directivas (si fueran aplicables):*

|    |            |                       |
|----|------------|-----------------------|
| I: | 2006/42/EG | Maschinenrichtlinie   |
|    | 2006/42/EC | Machinery directive   |
|    | 2006/42/CE | Directive Machines    |
|    | 2006/42/CE | Direttiva Macchine    |
|    | 2006/42/CE | Directiva de máquinas |

Die Schutzziele der Niederspannungsrichtlinie wurden gemäß Anhang I, Nr. 1.5.1 der Maschinenrichtlinie eingehalten.  
*The safety objectives of the Low-Voltage Directive comply with Annex I, No. 1.5.1 of the Machinery Directive.*  
*Les objectifs de sécurité de la Directive Basse Tension sont conformes à l'annexe I, No. 1.5.1 de la Directive Machines*  
*Gli obiettivi di sicurezza della Direttiva Bassa Tensione sono conformi a quanto riportato all'allegato I, No. 1.5.1 della Direttiva Macchine.*  
*Los objetivos de seguridad de la Directiva de Bajo Voltaje cumplen con el Anexo I, No. 1.5.1 de la Directiva de Máquinas*

Folgende Normen sind angewandt:  
*Following standards are used:*  
*Les normes suivantes sont appliquées:*  
*Vengono applicate le seguenti norme:*  
*Se utilizan los siguientes estándares:*

|    |                               |
|----|-------------------------------|
| a: | EN 60947-5-3:1999/A1:2005     |
| b: | EN ISO 14119:2013             |
| c: | EN ISO 13849-1:2008           |
| d: | EN 61784-3-3:2008 (Profisafe) |
| e: | EN 60947-5-5:1997/A1:2005     |

| Bezeichnung der Bauteile<br><i>Description of components</i><br><i>Description des composants</i><br><i>Descrizione dei componenti</i><br><i>Descripción de componentes</i>                                                                                                                                                         | Type<br><i>Type</i><br><i>Type</i><br><i>Tipo</i><br><i>Tipo</i> | Richtlinie<br><i>Directives</i><br><i>Directive</i><br><i>Direttiva</i><br><i>Directivas</i> | Normen<br><i>Standards</i><br><i>Normes</i><br><i>Norme</i><br><i>Estándares</i> | Zertifikats-Nr.<br><i>No. of certificate</i><br><i>Numéro du certificat</i><br><i>Numero del certificato</i><br><i>Número del certificado</i> |   |         |                     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|---|---------|---------------------|
| Sicherheitsschalter<br><i>Safety Switches</i><br><i>Interrupteurs de sécurité</i><br><i>Fincorsa di sicurezza</i><br><i>Interruptores de seguridad</i>                                                                                                                                                                              | MGB...PN ...                                                     | I                                                                                            | a, b, c, d                                                                       | Z10 10 04 40393 008                                                                                                                           |   |         |                     |
|                                                                                                                                                                                                                                                                                                                                     | MGB-B...PN...                                                    |                                                                                              |                                                                                  |                                                                                                                                               | I | c, d    | Z10 10 04 40393 008 |
|                                                                                                                                                                                                                                                                                                                                     | MGB-CB...PN...                                                   |                                                                                              |                                                                                  |                                                                                                                                               | I | c, d    | Z10 10 04 40393 008 |
| Sicherheitsschalter mit Not-Halt-Einrichtungen<br><i>Safety Switches with Emergency-Stop facilities</i><br><i>Interrupteurs de sécurité avec appareillage arrêt d'urgence</i><br><i>Fincorsa di sicurezza con dispositivi di arresto di emergenza</i><br><i>Interruptores de seguridad con dispositivos de parada de emergencia</i> | MGB...PN ...                                                     | I                                                                                            | a, b, c, d, e                                                                    | Z10 10 04 40393 008                                                                                                                           |   |         |                     |
|                                                                                                                                                                                                                                                                                                                                     | MGB-B...PN...                                                    |                                                                                              |                                                                                  |                                                                                                                                               | I | c, d, e | Z10 10 04 40393 008 |
|                                                                                                                                                                                                                                                                                                                                     | MGB-CB...PN...                                                   |                                                                                              |                                                                                  |                                                                                                                                               | I | c, d, e | Z10 10 04 40393 008 |

Benannte Stelle  
*Notified Body*  
*Organisme notifié*  
*Sede indicata*  
*Entidad citada*

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