

# **EUCHNER**

## **Operating Instructions**

**Transponder-Coded Safety Switch With Guard Locking**  
**CTP-L.-AS1 Unicode/Multicode**

**EN**

## Contents

<b>1.</b>	<b>About this document</b> .....	<b>4</b>
1.1.	Scope.....	4
1.2.	Target group .....	4
1.3.	Key to symbols.....	4
1.4.	Supplementary documents .....	4
<b>2.</b>	<b>Correct use</b> .....	<b>5</b>
<b>3.</b>	<b>Description of the safety function</b> .....	<b>6</b>
<b>4.</b>	<b>Exclusion of liability and warranty</b> .....	<b>7</b>
<b>5.</b>	<b>General safety precautions</b> .....	<b>7</b>
<b>6.</b>	<b>Function</b> .....	<b>8</b>
6.1.	Guard locking on version CTP-L1.....	8
6.2.	Guard locking on version CTP-L2.....	9
6.3.	Switching states .....	9
<b>7.</b>	<b>Manual release</b> .....	<b>10</b>
7.1.	Auxiliary release and auxiliary key release .....	10
7.1.1.	Actuating auxiliary release .....	10
7.1.2.	Actuating auxiliary key release .....	10
7.2.	Emergency unlocking .....	11
7.2.1.	Actuating emergency unlocking.....	11
7.3.	Escape release (optional) .....	11
7.3.1.	Actuating escape release.....	11
7.4.	Wire front release .....	12
7.4.1.	Laying wire front release.....	12
<b>8.</b>	<b>Changing the approach direction</b> .....	<b>13</b>
<b>9.</b>	<b>Installation</b> .....	<b>14</b>
<b>10.</b>	<b>Electrical connection</b> .....	<b>15</b>
10.1.	Notes about c(UL)us.....	15
10.2.	Setting the AS-Interface address .....	15
10.3.	Configuration in the AS-Interface safety monitor .....	15
10.3.1.	Dual-channel dependent.....	15
10.3.2.	Dual-channel conditionally dependent.....	16
10.3.3.	Dual-channel independent .....	16
10.4.	AS-Interface status messages.....	16
10.5.	Safety in case of faults.....	16
10.6.	Connection of guard locking control .....	17
10.6.1.	Guard locking control by means of switching the auxiliary voltage .....	17
10.6.2.	Guard locking control via ASi bit D0 (guard locking for process protection only) .....	17

<b>11.</b>	<b>Setup</b> .....	<b>18</b>
11.1.	LED displays .....	18
11.2.	Teach-in function for actuator (only for unicode evaluation) .....	18
11.2.1.	Actuator teach-in.....	18
11.3.	Functional check.....	19
11.3.1.	Mechanical function test.....	19
11.3.2.	Electrical function test.....	19
<b>12.</b>	<b>System status table</b> .....	<b>20</b>
<b>13.</b>	<b>Technical data</b> .....	<b>21</b>
13.1.	Technical data for safety switch CTP-AS.....	21
13.1.1.	Typical system times.....	21
13.2.	Radio frequency approvals.....	22
13.3.	Dimension drawing for safety switch CTP.....	23
13.4.	Technical data for actuator CTP-... ..	25
13.4.1.	Dimension drawing for actuator CTP-... ..	25
<b>14.</b>	<b>Ordering information and accessories</b> .....	<b>28</b>
<b>15.</b>	<b>Inspection and service</b> .....	<b>28</b>
<b>16.</b>	<b>Service</b> .....	<b>28</b>
<b>17.</b>	<b>Declaration of conformity</b> .....	<b>29</b>

## 1. About this document

### 1.1. Scope

These operating instructions are valid for all CTP-L.-AS1... from version V1.0.0. These operating instructions, the document "Safety information and maintenance" and any enclosed data sheet form the complete user information for your device.

### 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	Meaning
	Printed document
	Document is available for download at <a href="http://www.euchner.com">www.euchner.com</a>
	Document on CD
	This section is applicable only if the memory card is used
 <b>DANGER</b> <b>WARNING</b> <b>CAUTION</b>	Safety precautions <b>Danger</b> of death or severe injuries <b>Warning</b> about possible injuries <b>Caution</b> slight injuries possible
 <b>NOTICE</b> <b>Important!</b>	<b>Notice</b> about possible device damage <b>Important</b> information
<b>Tip</b>	Useful information

### 1.4. Supplementary documents

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

Document title (document number)	Contents	
Safety Information and Maintenance CTP/CET (2113769)	Basic information for safe setup and service	
Operating Instructions (2124662)	(this document)	
Possibly enclosed data sheet	Item-specific information about deviations or additions	
	<b>Important!</b> 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.com">www.euchner.com</a> . For this purpose enter the doc. no. in the search box.	

### 2. Correct use

Safety switches series CTP-L-... are operated as slaves on the safety bus AS-Interface Safety at Work and function as interlocking devices with guard locking (type 4). The device complies with the requirements according to EN IEC 60947-5-3. Devices with unicode evaluation possess a high coding level, devices with multicode evaluation possess a low coding level.

In combination with a movable guard and the machine control, this safety component prevents the 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 guard is closed and locked.
- › The guard locking device must not be unlocked until the dangerous machine function has ended.
- › Closing and locking a 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.

Devices from this series are also suitable for process protection.

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, 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 switch is allowed to be operated only in conjunction with the intended EUCHNER actuator and the related connection components from EUCHNER. On the use of different actuators or other connection components, EUCHNER provides no warranty for safe function.



#### 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.
- › It is only allowed to use components that are permissible in accordance with the table below.

Table 1: Possible combinations for CTP components

Safety switch	Actuator	
	A-C-H...	
CTP-... Unicode/Multicode	●	
<b>Key to symbols</b>	●	Combination possible

### 3. Description of the safety function

Devices from this series feature the following safety functions:

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

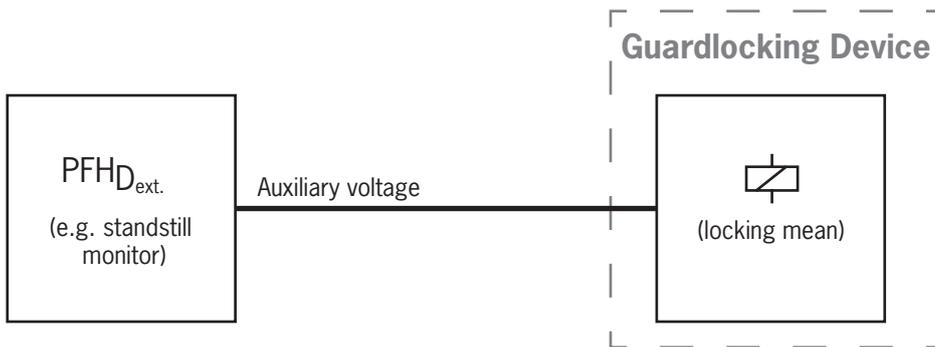
- Safety function (see chapter 6.3. *Switching states on page 9*):
  - When guard locking is unlocked, no valid code sequence is sent (monitoring of the locking device).
  - When the guard is open, no valid code sequence is sent (monitoring of the door position).
  - Guard locking can be activated only when the actuator is located in the switch head (failsafe locking mechanism).
- Safety characteristics: category, Performance Level, PFH<sub>D</sub> (see chapter 13. *Technical data on page 21*).

#### Activation of guard locking by switching on/off the auxiliary voltage

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

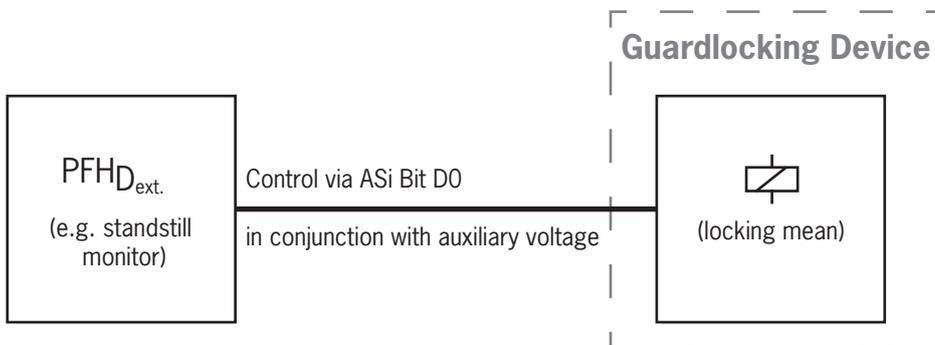
The device does not feature a safety characteristic for control of guard locking, because the guard locking solenoid is completely disconnected from outside the device via the auxiliary power (no control function within the device). It therefore does not contribute to the failure probability.

The safety level for the control of the guard locking is defined only by the external control (e.g. PFH<sub>D, ext.</sub> for the standstill monitor).



#### Control via ASi bit D0 (only for process protection) in conjunction with auxiliary voltage

Because control is via the non-safe bit D0, this control is only allowed to be used for process protection.



### 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 precautions

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

Check the safe function of the guard particularly

- › after any setup work
- › after the replacement of a system component
- › after an extended period without use
- › after every fault

Independent of these checks, the safe function of the 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 personnel 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 must be triggered only by actuators designated for this purpose.
- › 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.com](http://www.euchner.com).

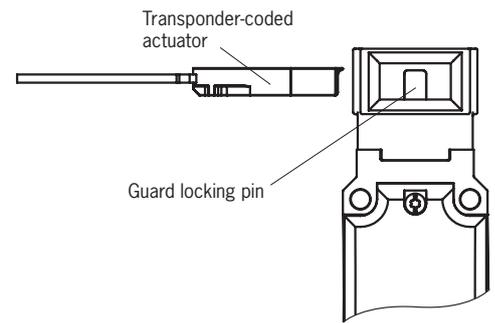
## 6. Function

The device permits the locking of movable guards.

The system consists of the following components: coded actuator (transponder) and switch.

Whether the device learns the complete actuator code (unicode) or not (multicode) depends on the respective version.

- › **Devices with unicode evaluation:** The actuator must be assigned to the safety switch by a teach-in operation so that it is detected by the system. This unambiguous assignment ensures a particularly high level of protection against tampering. The system thus possesses a high coding level.
- › **Devices with multicode evaluation:** Unlike systems with unique code detection, on multicode devices a specific code is not requested but instead it is only checked whether the actuator is of a type that can be detected by the system (multicode detection). There is no exact comparison of the actuator code with the taught-in code in the safety switch (unique code detection). The system possesses a low coding level.



When the guard is closed, the actuator is moved into the safety switch. When the switch-on distance is reached, power is supplied to the actuator by the switch and data are transferred.

If the guard is closed, guard locking is effective and the code is permissible, each CTP-AS transmits a switch-specific, unique safety code sequence with 8 x 4 bits via the AS-Interface bus.

The zero sequence is transmitted via the AS-Interface bus when the guard is unlocked.

In the event of a fault in the safety switch, the zero sequence is transmitted via the AS-Interface bus and the LOCK/DIA LED illuminates red. The occurrence of faults is detected at the latest on the next demand to close the safety outputs (e.g. on starting).

### 6.1. Guard locking on version CTP-L1

(Guard locking actuated by spring force and released by power-ON)

**Activating guard locking:** Close guard; no auxiliary power at the solenoid and/or clear AS-Interface output bit D0.

**Releasing guard locking:** Apply auxiliary power to the solenoid and set AS-Interface output bit D0.

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



#### Important!

- › If the guard is open when the auxiliary power is interrupted and the guard is then closed, guard locking is activated. This can lead to persons being locked in unintentionally.
- › To ensure safe control of the guard locking, the auxiliary power must be shut down.

The actuator cannot be pulled out of the switch and the guard is locked as long as the guard locking pin is extended.

If the solenoid is controlled via the ASi bus and auxiliary power is applied to the solenoid, the guard locking pin is retracted and the actuator is released. The guard can be opened.

### 6.2. Guard locking on version CTP-L2

(Guard locking actuated by power-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 auxiliary power to the solenoid and set AS-Interface output bit D0.

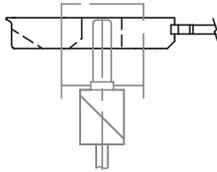
**Releasing guard locking:** No auxiliary power at the solenoid and/or clear AS-Interface output bit D0.

The magnetically actuated guard locking operates in accordance with the open-circuit current principle. If the solenoid is not controlled (D0=0) or if auxiliary power is switched off, guard locking is released and the guard can be opened directly!

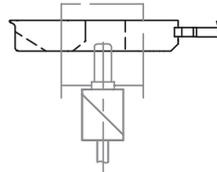
If the solenoid is controlled via the ASi bus (D0=1) and auxiliary power is applied to the solenoid, the guard locking pin is held in extended position and the guard is locked.

### 6.3. Switching states

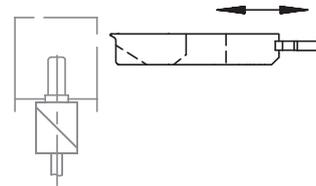
Guard closed and locked



Guard closed and not locked



Guard open



Programming	State	D0, D1	D2, D3	Monitor diagnostics
Dual-channel conditionally dependent	Guard closed and locked	Code sequence		Green
	Guard closed and not locked	Half-sequence	00	Yellow flashing
	Invalid state (guard open, guard locking active)	00	Half-sequence	Red flashing (monitoring of the invalid state)
	Guard open	00	00	Red
	Address 0 or communication disrupted	-		Gray
Dual-channel independent	Guard closed and locked	Code sequence		Green
	Guard closed and not locked	Half-sequence	00	Red
	Invalid state (guard open, guard locking active)	00	Half-sequence	Red
	Guard open	00	00	Red
	Address 0 or communication disrupted	-		Gray
Dual-channel dependent Synchronization time infinite $\infty$	Guard closed and locked	Code sequence		Green if guard was previously open or yellow flashing after startup if only the guard locking was open.
	Guard closed and not locked	Half-sequence	00	Yellow flashing if guard was previously closed. Red if guard was previously open.
	Invalid state (guard open, guard locking active)	00	Half-sequence	Yellow flashing if guard was previously closed. Red if guard was previously open.
	Guard open	00	00	Red
	Address 0 or communication disrupted	-		Gray

## 7. Manual release



### Important!

No further release functions can be retrofitted on Extended variants with controls in position 1 (S1) and position 2 (S2).

Some situations require the 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:

### 7.1. Auxiliary release and auxiliary key release

In the event of malfunctions, the guard locking can be released with the auxiliary release irrespective of the state of the solenoid.

The zero sequence is sent via the ASi bus when the auxiliary release is actuated.

Open the guard and close it again after resetting the auxiliary release. The device will then operate normally again.

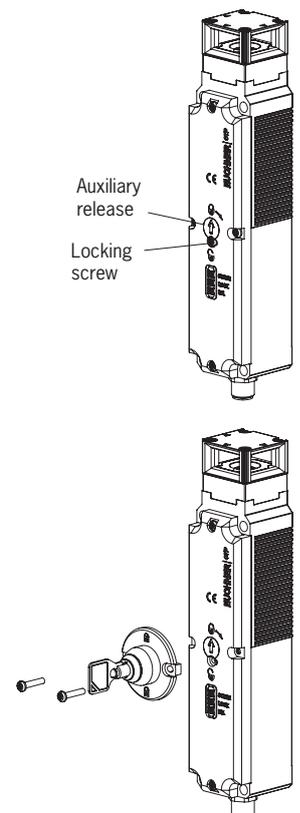
#### 7.1.1. Actuating auxiliary release

1. Unscrew locking screw.
  2. Using a screwdriver, turn the auxiliary release to  in the direction of the arrow.
- ➔ Guard locking is released.



### Important!

- › The actuator must not be under tensile stress during manual release.
- › After use, reset the auxiliary release and screw in and seal the locking screw (e.g. with sealing lacquer).
- › The auxiliary key release must not be used to lock the switch during servicing to prevent activation of guard locking, for example.
- › Loss of the release function due to mounting errors or damage during mounting.
- › Check the release function every time after mounting.
- › Please observe the notes on any enclosed data sheets.



#### 7.1.2. Actuating auxiliary key release

On devices with auxiliary key release (can be retrofitted), simply turn the key to release. Function as for auxiliary release. For mounting, see the auxiliary key release supplement.

### 7.2. Emergency unlocking

Permits opening of a locked guard from outside the danger zone without tools. For mounting, see the mounting supplement.



#### Important!

- › It must be possible to operate the emergency unlocking manually from outside the protected area without tools.
- › The emergency unlocking must possess a marking indicating that it may be used only in an emergency.
- › The actuator must not be under tensile stress during manual release.
- › The emergency unlocking must be sealed or the misuse of the release function must be prevented in the control system.
- › The unlocking function meets all other requirements from EN ISO 14119.
- › The emergency unlocking meets the requirements of Category B according to EN ISO 13849-1:2015.
- › Loss of the release function due to mounting errors or damage during mounting.
- › Check the release function every time after mounting.
- › Please observe the notes on any enclosed data sheets.

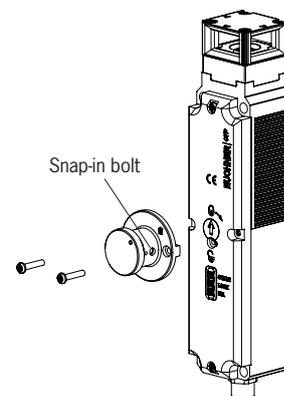
#### 7.2.1. Actuating emergency unlocking

- › Turn emergency unlocking clockwise until it clicks into place.
- ➔ Guard locking is released.

To reset, press the snap-in bolt inward using a small screwdriver or similar tool and turn the emergency unlocking back.

The zero sequence is sent via the ASi bus when the emergency unlocking is actuated.

Open the guard and close it again after resetting the emergency unlocking. The device will then operate normally again.



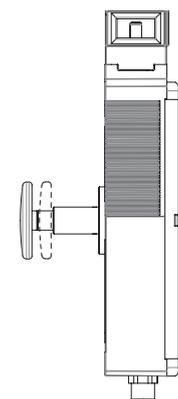
### 7.3. Escape release (optional)

Permits opening of a locked guard from the danger zone without tools (see chapter 13.2. Radio frequency approvals on page 22).



#### Important!

- › It must be possible to actuate 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 13849-1:2015.



#### 7.3.1. Actuating escape release

- › Press the red release knob to the end stop
- ➔ Guard locking is released.

Pull the knob out again to reset.

The half-sequence/zero sequence is sent via the ASi bus when the escape release is actuated.

Open the guard and close it again after resetting the escape release. The device will then operate normally again.

## 7.4. Wire front release

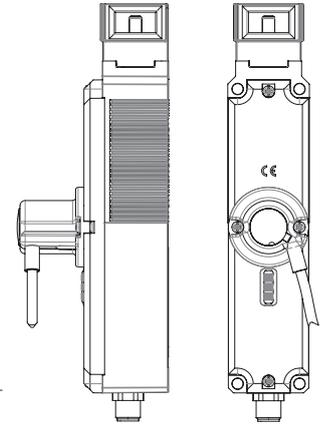
Release via a pull wire. Depending on the type of attachment, the wire front release can be used as emergency unlocking or escape release.

The following applies to non-latching wire front releases.

If the release is to be used as emergency unlocking, one of the following measures must be taken (see EN ISO 14119:2013, section 5.7.5.3):

- › Install the release so that it can be reset only with the aid of a tool.
- › Alternatively, the reset can be undertaken at the control system level. E.g. by means of a plausibility check (status of the transmitted code sequence/zero sequence does not match the guard locking control signal).

The emergency-unlocking specifications in chapter 7.2 on Page 11 apply irrespective of this information.



### Important!

- › The wire front release meets the requirements of Category B according to EN ISO 13849-1:2015.
- › The correct function depends on the laying of the pull wire and on the attachment of the pull handle, and this is the responsibility of the plant manufacturer.
- › The actuator must not be under tensile stress during manual release.

### 7.4.1. Laying wire front release



### Important!

- › Loss of the release function due to mounting errors, damage or wear.
- › Check the release function every time after mounting.
- › When routing the wire front release, ensure that it operates smoothly.
- › Observe the min. bending radius (100 mm) and minimize the number of bends.
- › The switch is not allowed to be opened.
- › Observe the notes on the enclosed data sheets.

## 8. Changing the approach direction

The approach direction needs to be changed only if the switch is to be approached from the rear.

Proceed as follows:

1. Remove the screws from the safety switch
2. Set the required direction
3. Tighten the screws with a torque of 1.2 Nm

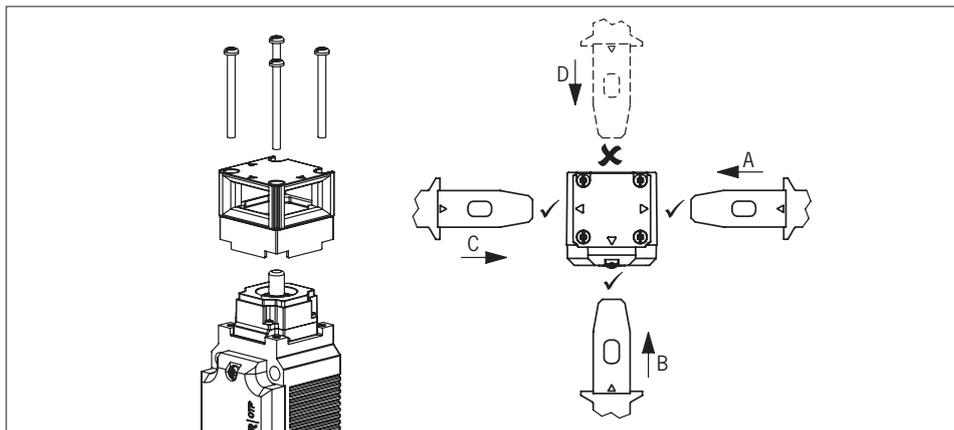


Figure 1: Changing the approach direction

## 9. Installation



### CAUTION

Safety switches must not be bypassed (bridging of contacts), turned away, removed or otherwise rendered ineffective.

- › Observe EN ISO 14119:2013, section 7, for information about reducing the possibilities for bypassing an interlocking device.



### NOTICE

Risk of damage to equipment and malfunctions as a result of incorrect installation.

- › Safety switches and actuators must not be used as an end stop.
- › Observe EN ISO 14119:2013, sections 5.2 and 5.3, for information about fastening the safety switch and the actuator.
- › Protect the switch head against damage, as well as penetrating foreign objects such as swarf, sand and blasting shot, etc.
- › Observe the min. door radii (see chapter 13.4.1. *Dimension drawing for actuator CTP-... on page 25*).
- › Observe the tightening torque for fastening the switch (max.1.4 Nm).

A clearance of 12 mm must be maintained around the actuator head (see *Figure 2*).

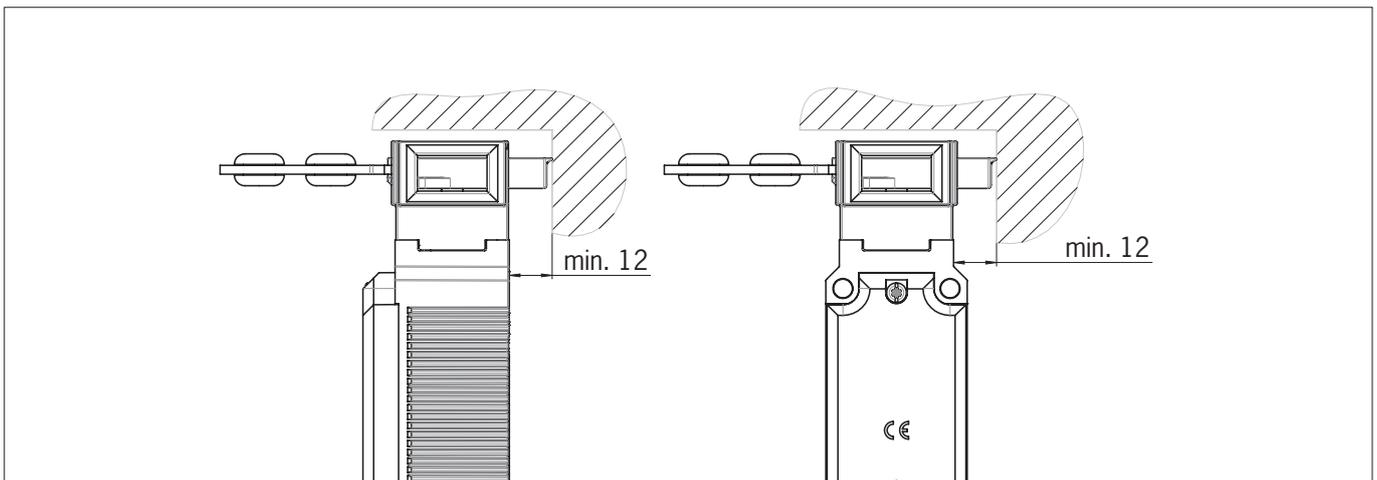


Figure 2: Actuator head clearance

### 10. Electrical connection

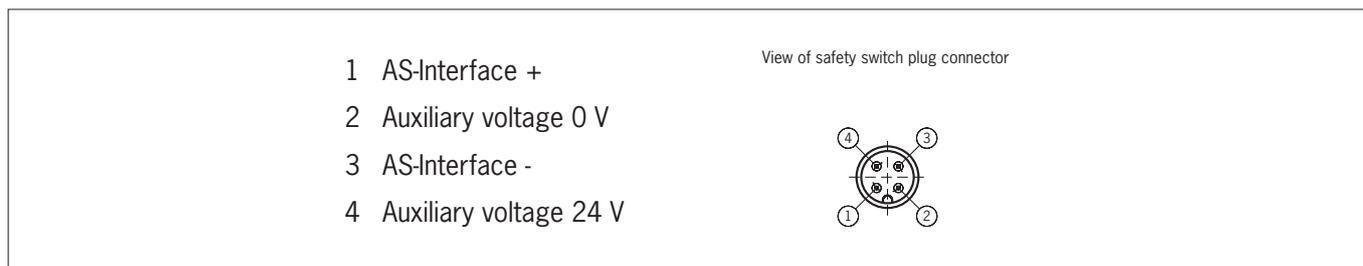


Figure 3: Terminal assignment, AS-Interface M12 plug connector

#### 10.1. Notes about



##### Important!

- › 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.  
Alternative solutions must comply with the following requirements:  
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.
- › For use and applications as per the  requirements <sup>1)</sup>, a connection cable listed under UL category code CYJV/7, min. 24 AWG, min 80 °C, must be used.

<sup>1)</sup> Note on the scope of the UL approval: the devices have been tested as per the requirements of UL508 and CSA/ C22.2 no. 14 (protection against electric shock and fire).

#### 10.2. Setting the AS-Interface address

The address can be set prior to or after mounting.

The AS-Interface address of the safety switch is set using an AS-Interface programming device. Addresses 1 to 31 are valid.

The unit is programmed by connecting the programming device to the M12 plug connector of the safety switch with a programming cable.

Address 0 is the default setting on delivery (the AS-Interface LED flashes alternately red/yellow).

#### 10.3. Configuration in the AS-Interface safety monitor

(see operating instructions for the AS-Interface safety monitor)

##### 10.3.1. Dual-channel dependent

**Cat.**  
**4**

The safety switch is configured in the AS-Interface safety monitor with the AS-Interface address set as follows, for example:

- › Dual-channel dependent
- › With or without start-up test
- › Synchronization time = infinite

In this operating mode, the guard must be opened each time prior to restarting.

### 10.3.2. Dual-channel conditionally dependent

**Cat.  
4**

The safety switch is configured in the AS-Interface safety monitor with the AS-Interface address set as follows, for example:

- Dual-channel conditionally dependent
- Independent: In-1



**Important!**

The switch is monitored for a malfunction; the door monitoring must not switch before guard locking monitoring. The guard does not have to be opened in this operating mode. Safety is provided again when the guard locking is closed.

### 10.3.3. Dual-channel independent

**Cat.  
1**

The safety switch is configured in the AS-Interface safety monitor with the AS-Interface address set as follows, for example:

- Dual-channel independent
- With or without start-up test



**Important!**

Failure of a signal or function is not detected in this operating mode. The guard does not have to be opened in this operating mode. Safety is provided again when the guard locking is closed.

## 10.4. AS-Interface status messages

A dual LED (red/green) displays the colors red, green and yellow. The following table provides assistance with troubleshooting.

State ASI LED	Explanation
green	Normal operation
red	No data exchange between master and slave Cause: - Master in STOP mode - Slave not in LPS - Slave with wrong IO/ID
red/yellow alternately flashing	No data exchange between master and slave Cause: slave address = 0
red/green alternately flashing	Device fault in the slave. Contact EUCHNER.
red flashing	

## 10.5. Safety in case of faults

The ASI power supply and the auxiliary voltage are reverse polarity protected.

### 10.6. Connection of guard locking control

#### 10.6.1. Guard locking control by means of switching the auxiliary voltage

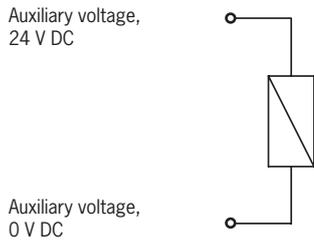


Figure 4: Connection example guard locking control by means of switching the auxiliary voltage

#### 10.6.2. Guard locking control via ASi bit D0 (guard locking for process protection only)

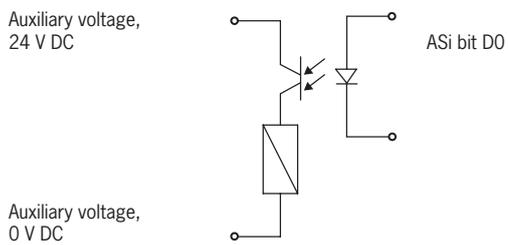


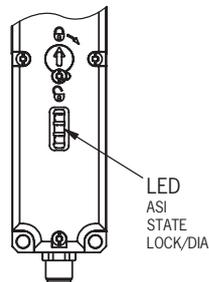
Figure 5: Connection example guard locking control via ASi bit D0 (guard locking for process protection only)

## 11. Setup

### 11.1. LED displays

You will find a detailed description of the signal functions in chapter 12. *System status table on page 20.*

LED	Color
ASI	green/red
STATE	green
LOCK/DIA	yellow/red



### 11.2. Teach-in function for actuator (only for unicode evaluation)

The actuator must be allocated to the safety switch using a teach-in function before the system forms a functional unit.

The half-sequence is output during a teach-in operation. The number of possible teach-in operations is unlimited.



#### Tip!

Prior to switching on, close the guard on which the actuator to be taught in is installed. The teach-in operation starts immediately after switching on.



#### Important!

- › The teach-in operation may be performed only if the device does not have any internal errors.
- › Devices in the condition as supplied remain in teach-in standby state until you have successfully taught in the first actuator. Once taught in, switches remain in the teach-in standby state for approx. 3 min. after each switch-on.
- › The safety switch disables the code of the previous actuator if teach-in is carried out for a new actuator. Teach-in is not possible again immediately for this actuator if a new teach-in operation is carried out. The disabled code is released again in the safety switch only after a third code has been taught in.
- › The safety switch can be operated only with the last actuator taught in.
- › If the switch detects the actuator that was most recently taught when in the teach-in standby state, this state is ended immediately and the switch changes to normal state.
- › The actuator to be taught in is not activated if it is within the operating distance for less than 30 s.

#### 11.2.1. Actuator teach-in

1. Establish teach-in standby:
  - Devices in the condition as supplied: unlimited teach-in standby after switching on
  - Switch already taught in: teach-in standby is available for approx. 3 min after switching on
- ➔ Teach-in standby indication, STATE LED flashes 3x repeatedly
2. Insert the actuator during teach-in standby.
  - ➔ The automatic teach-in operation starts (duration approx. 30 s). During the teach-in operation the STATE LED flashes (approx. 1 Hz). Alternate flashing of the STATE and LOCK/DIA LEDs acknowledges the successful teach-in operation. Teach-in errors are indicated by the illumination of the red LOCK/DIA LED and a flashing code on the green STATE LED (see chapter 12. *System status table on page 20*).
3. Switch off operating voltage (min. 3 s).
  - ➔ The code of the actuator that was just taught in is activated in the safety switch.
4. Switch on operating voltage.
  - ➔ The device operates normally.

### 11.3. Functional check



#### WARNING

Danger of fatal injury as a result of faults in installation and functional check.

- › Before carrying out the functional check, make sure that there are no persons in the danger zone.
- › Observe the applicable accident prevention regulations.

#### 11.3.1. Mechanical function test

The actuator must slide easily into the actuating head. Close the guard several times to check the function. For devices with mechanical release (emergency unlocking or escape release), the correct function of the release must be checked as well.

#### 11.3.2. Electrical function test

After installation and any fault, the safety function must be fully checked. Proceed as follows:

1. Switch on operating voltage.
  - ➔ The machine must not start automatically.
  - ➔ The safety switch carries out a self-test. The green STATE LED then flashes at regular intervals.
2. Close all guards. Guard locking by solenoid force: activate guard locking.
  - ➔ The machine must not start automatically. It must not be possible to open the guard.
  - ➔ The green STATE LED and the yellow LOCK/DIA LED are illuminated continuously.
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 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.

Repeat steps 2 - 4 for each guard.

## 12. System status table

The dual LOCK/DIA LED displays the colors red and yellow. Depending on the state, both colors can flash alternately.

Operating mode	Actuator/door position	LED indicator Output		LOCK/DIA (yellow)	State
		STATE (green)	LOCK/DIA (red)		
Normal operation	closed		○		Normal operation, door closed and locked
	closed	 1 x in-verse	○	○	Normal operation, door closed and <b>not</b> locked
	open	 1 x	○	○	Normal operation, door open
Teach-in operation (only unicode)	X	 3 x	○	○	Device in teach-in standby
	closed	 1 Hz	○	○	Teach-in operation
	X	 ↔ 	○	○	Positive acknowledgment after completion of teach-in operation
Fault display	X	 1 x		○	Fault in the teach-in operation (only unicode) Actuator removed from the operating distance prior to the end of the teach-in operation or faulty actuator detected.
	X	 3 x		○	Read error (e.g. actuator faulty)
	X	 5 x		○	Disabled actuator detected
	X	○		X	Internal error
Key to symbols	○				LED not illuminated
					LED illuminated
	 10 Hz (8 s)				LED flashes for 8 s at 10 Hz
	 3 x				LED flashes three times, and this is then repeated
					LEDs flash alternately
	X				Any state

After the cause has been remedied, faults can generally be reset by opening and closing the guard. If the fault is still displayed afterward, use the reset function or briefly interrupt the power supply. Please contact the manufacturer if the fault could not be reset after restarting.



### 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.

### 13. Technical data



#### NOTICE

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

#### 13.1. Technical data for safety switch CTP-AS

Parameter	Value			Unit
	min.	typ.	max.	
<b>General</b>				
Material	Die-cast zinc			
- Switch head	Reinforced thermoplastic			
- Switch housing				
Installation position	Any			
Degree of protection	IP 67/IP 69/IP 69K (screwed tight with the related mating connector)			
Safety class according to EN IEC 61558	III			
Mechanical life	1 x 10 <sup>6</sup> operating cycles			
Ambient temperature at UB = 24 V	-20	-	+55	°C
Actuator approach speed, max.	20			m/min
Actuating/extraction/retention force at 20 °C	10/20/20			N
Locking force F <sub>max</sub> <sup>1)</sup>	3900			N
Locking force F <sub>Zh</sub> <sup>1)</sup> according to EN ISO 14119	F <sub>Zh</sub> = F <sub>max</sub> /1.3 = 3,000			N
Weight	Approx. 0.42			kg
Connection	Plug connector M12, 4-pin			
For the approval according to UL the following applies	Operation only with UL class 2 power supply, or equivalent measures			
Resilience to vibration	Acc. to EN 60947-5-3			
EMC protection requirements	Acc. to EN 60947-5-3			
Ready delay	-	-	1	s
Risk time	-	-	260	ms
Switch-on time	-	-	400	ms
Frequency band	120 ... 130			kHz
<b>Solenoid</b>				
Auxiliary voltage	24 +10%/-15% (PELV)			V DC
Current consumption with auxiliary voltage	400			mA
Duty cycle	100			%
<b>AS-Interface data</b>				
		EA code: 7		ID code: B
AS-i operating voltage	26.5	-	31.6	V DC
Total current consumption from AS-i	CTP...AS.A	-	450	mA
	CTP...AS.B	-	50	
Valid AS-Interface addresses	1 - 31			
<b>AS-Interface inputs</b>				
Acc. to ASi Safety at work				
Influenced by door position	CTP...AS1..	D0, D1		
	CTP...AS2..	D0, D1, D2, D3		
Influenced by guard locking	CTP...AS1..	D2, D3		
	CTP...AS2..	D0, D1, D2, D3		
<b>AS-Interface outputs</b>				
Guard locking solenoid	D0 (1 = solenoid energized)			
<b>Reliability values acc. to EN ISO 13849-1</b>				
Mission time	20			years
<b>Monitoring of guard locking and the guard position</b>				
Category	4			
Performance Level (PL)	e			
PFD <sub>0</sub>	4.1 x 10 <sup>-9</sup> /h			
<b>Control of guard locking</b>				
Category				
Performance Level (PL)	Depends on external control			
PFD <sub>0</sub>				

1) Dependent on the actuator used.

#### 13.1.1. Typical system times

Please refer to the technical data for the exact values.

**Ready delay:** After switching on, the device carries out a self-test. The system is ready for operation only after this time.

**Switch-on time of safety outputs:** The max. reaction time  $t_{on}$  is the time from the moment when the guard is locked to the moment when the safety outputs switch on.

**Risk time according to EN 60947-5-3:** If an actuator moves outside the operating distance, transmission of the code sequence on the corresponding safety switch is deactivated at the latest after the risk time.

## **13.2. Radio frequency approvals**

**FCC ID: 2AJ58-05**

**IC: 22052-05**



### **FCC/IC-Requirements**

This device complies with part 15 of the FCC Rules and with Industry Canada's licence-exempt RSSs. Operation is subject to the following two conditions:

- 1) This device may not cause harmful interference, and
- 2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

- (1) l'appareil ne doit pas produire de brouillage, et
- (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

### **Supplier's Declaration of Conformity** **47 CFR § 2.1077 Compliance Information**

#### **Unique Identifier:**

CTP-I-AR SERIES  
CTP-I1-AR SERIES  
CTP-I2-AR SERIES  
CTP-IBI-AR SERIES  
CTP-L1-AR SERIES  
CTP-L2-AR SERIES  
CTP-LBI-AR SERIES  
CTP-I-AP SERIES  
CTP-I1-AP SERIES  
CTP-I2-AP SERIES  
CTP-IBI-AP SERIES  
CTP-L1-AP SERIES  
CTP-L2-AP SERIES  
CTP-LBI-AP SERIES

#### **Responsible Party – U.S. Contact Information**

##### **EUCHNER USA Inc.**

6723 Lyons Street  
East Syracuse, NY 13057

+1 315 701-0315

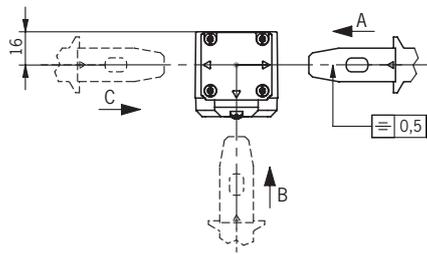
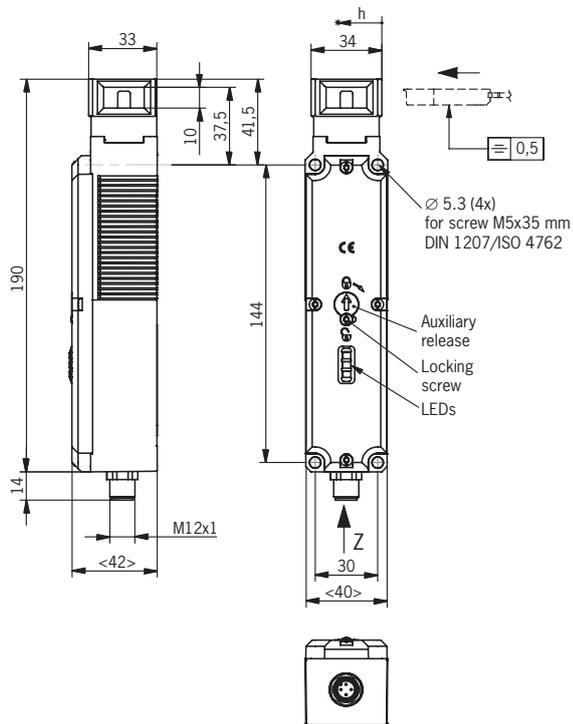
+1 315 701-0319

info(at)euchner-usa.com

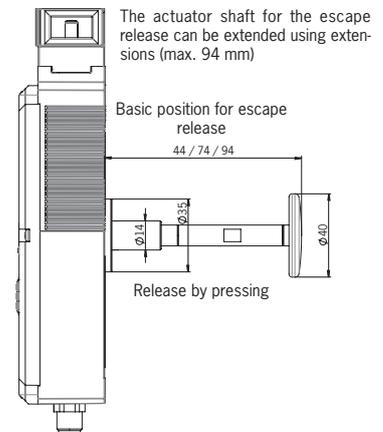
<http://www.euchner-usa.com>

### 13.3. Dimension drawing for safety switch CTP...

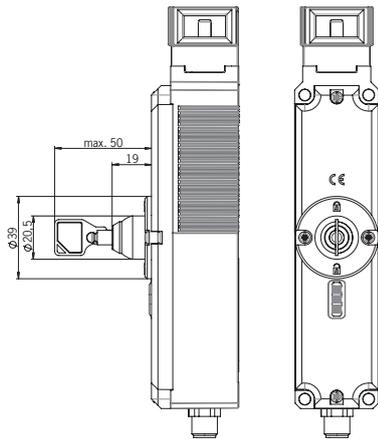
Version with plug connector M12



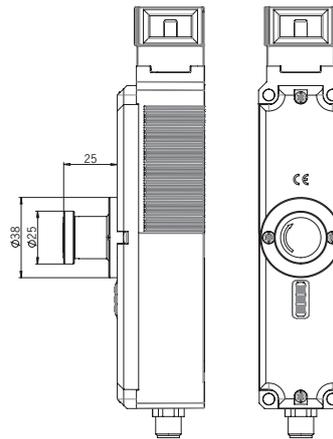
#### With escape release



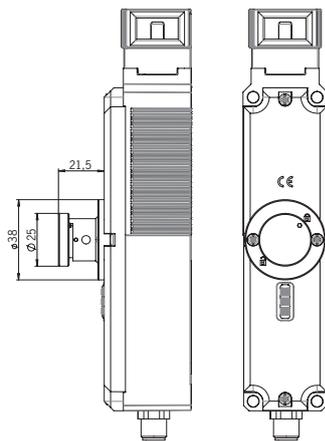
With auxiliary key release



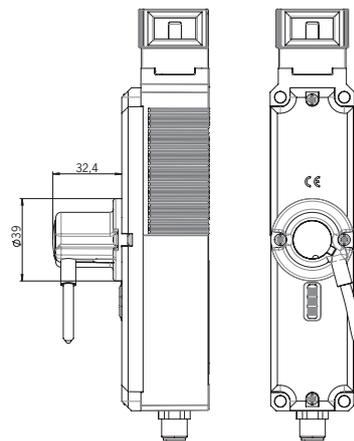
With auxiliary release



With emergency unlocking



With wire front release



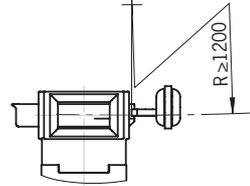
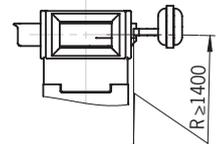
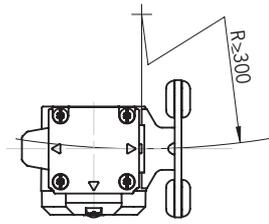
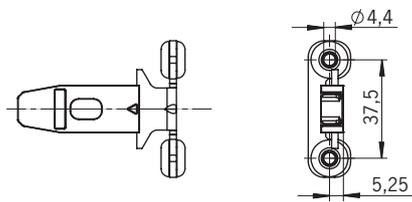
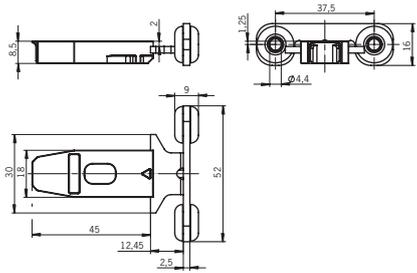
### 13.4. Technical data for actuator CTP-...

Parameter	Value			Unit
	min.	typ.	max.	
Housing material	Fiber reinforced plastic			
Weight	0.03 ... 0.06 (depending on version)			kg
Ambient temperature	-20	-	+55	°C
Degree of protection	IP 67/IP 69/IP 69K			
Mechanical life	1 x 10 <sup>6</sup>			
Locking force, max. - Straight actuator 126015 (red) 122666 (black) - Hinged actuator - Bent actuator		3900 2600 2600 1500		N
Installation position	Any			
Power supply	Inductive via read head			

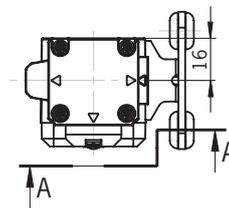
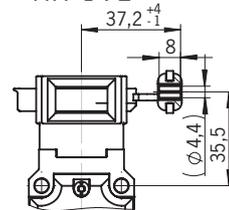
#### 13.4.1. Dimension drawing for actuator CTP-...

	Dimension drawing	Min. door radius [mm]	Order no./item
Straight actuators			<b>122666</b> A-CH-G-SST-122666
			<b>126015</b> A-CH-G-SST-126015

Bent actuators



A-A 1 : 2



**122667**  
 A-CHW-SST-122667

**122668**  
 A-CHW-SST-122668

	Dimension drawing	Min. door radius [mm]	Order no./item
Hinged actuators		<p>max. 28    X <math>\begin{smallmatrix} +4 \\ -1 \end{smallmatrix}</math></p> <p>X = 53 mm (122671, 122672) X = 49 mm (122669, 122670)</p>	<p><b>122671</b> A-C-HRL-LS-122671</p>
		<p>max. 28    X <math>\begin{smallmatrix} +4 \\ -1 \end{smallmatrix}</math></p> <p>X = 41 mm (122673, 122674) X = 45 mm (122675, 122676)</p>	<p><b>122672</b> A-C-HRL-LS-122672</p>
Hinged actuators		<p>max. 28    X <math>\begin{smallmatrix} +4 \\ -1 \end{smallmatrix}</math></p> <p>X = 41 mm (122673, 122674) X = 45 mm (122675, 122676)</p>	<p><b>122675</b> A-C-HR0-LS-122675</p>
		<p>max. 28    X <math>\begin{smallmatrix} +4 \\ -1 \end{smallmatrix}</math></p> <p>X = 41 mm (122673, 122674) X = 45 mm (122675, 122676)</p>	<p><b>122676</b> A-C-HR0-LS-122676</p>



### Tip!

Safety screws are included with the actuator.

## 14. Ordering information and accessories



**Tip!**

Suitable accessories, e.g. cables or assembly material, can be found at [www.euchner.com](http://www.euchner.com). To order, enter the order number of your item in the search box and open the item view. Accessories that can be combined with the item are listed in "Accessories."

## 15. Inspection and service



**WARNING**

Danger of severe injuries due to the loss of the safety function.

- › If damage or wear is found, the complete switch and actuator assembly must be replaced. Replacement of individual parts or assemblies is not permitted.
- › Check the device for proper function at regular intervals and after every fault. For information about possible time intervals, refer to EN ISO 14119:2013, section 8.2.

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

- › Check the switching function (see chapter 11.3. *Functional check on page 19*)
- › Check all additional functions (e.g. escape release, lockout bar, etc.)
- › 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 is given in the laser marking at the bottom right corner. The current version number in the format (V X.X.X) can also be found on the device.

## 16. Service

If service support is required, please contact:

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

**Service telephone:**

+49 711 7597-500

**E-mail:**

[support@euchner.de](mailto:support@euchner.de)

**Internet:**

[www.euchner.com](http://www.euchner.com)

### 17. Declaration of conformity



# EUCHNER

More than safety.

**EU-Konformitätserklärung**  
**EU declaration of conformity**  
**Déclaration UE de conformité**  
**Dichiarazione di conformità UE**  
**Declaración UE de conformidad**

Original DE  
 Translation EN  
 Traduction FR  
 Traduzione IT  
 Traducción ES

2123042-07-03/19

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:	Maschinenrichtlinie	2006/42/EG
	<i>Machinery directive</i>	<i>2006/42/EC</i>
	<i>Directive Machines</i>	<i>2006/42/CE</i>
	<i>Direttiva Macchine</i>	<i>2006/42/CE</i>
	<i>Diretiva de máquinas</i>	<i>2006/42/CE</i>
II:	Funkanlagen-Richtlinie (RTTE / RED)	2014/53/EU
	<i>Radio equipment directive</i>	<i>2014/53/EU</i>
	<i>Directive équipement radioélectrique</i>	<i>2014/53/UE</i>
	<i>Direttiva apparecchiatura radio</i>	<i>2014/53/UE</i>
	<i>Diretiva equipo radioeléctrico</i>	<i>2014/53/UE</i>
III:	RoHS Richtlinie	2011/65/EU
	<i>RoHS directive</i>	<i>2011/65/EU</i>
	<i>Directive de RoHS</i>	<i>2011/65/UE</i>
	<i>Direttiva RoHS</i>	<i>2011/65/UE</i>
	<i>Diretiva RoHS</i>	<i>2011/65/UE</i>

Die Schutzziele der Niederspannungsrichtlinie 2014/35/EU und EMV Richtlinie 2014/30/EU werden gemäß Artikel 3.1 der Funkanlagen-Richtlinie eingehalten.

*The safety objectives of the Low-voltage directive 2014/35/EU and EMC Directive 2014/30/EU comply with article 3.1 of the Radio equipment directive.*

*Les objectifs de sécurité de la Directive basse tension 2014/35/UE et Directive de CEM 2014/30/UE sont conformes à l'article 3.1 de la Directive équipement radioélectrique.*

*Gli obiettivi di sicurezza della Direttiva bassa tensione 2014/35/UE e Direttiva CEM 2014/30/UE sono conformi a quanto riportato nell'articolo 3.1 della Direttiva apparecchiatura radio.*

*Los objetivos de seguridad de la Directiva de bajo voltaje 2014/35/UE y Directiva CEM 2014/30/UE cumplen con el artículo 3.1 de la Directiva equipo radioeléctrico.*

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 60947-5-3:2013	f:	EN 50581:2012 (RoHS)
b:	EN ISO 14119:2013	g:	EN 50364:2010
c:	EN ISO 13849-1:2015	h:	EN 300 330 V2.1.1
d:	EN 62026-2:2013 (ASI)		
e:	EN 60947-5-5:1997/A1:2005/A11:2013		

Bezeichnung der Bauteile <i>Description of components</i> <i>Description des composants</i> <i>Descrizione dei componenti</i> <i>Descripción de componentes</i>	Type <i>Type</i> <i>Type</i> <i>Tipo</i> <i>Typo</i>	Richtlinie <i>Directives</i> <i>Directive</i> <i>Direttiva</i> <i>Directivas</i>	Normen <i>Standards</i> <i>Normes</i> <i>Norme</i> <i>Estándares</i>	Zertifikats-Nr. <i>No. of certificate</i> <i>Numéro du certificat</i> <i>Norme</i> <i>Número del certificado</i>
Sicherheitsschalter <i>Safety Switches</i> <i>Interrupteurs de sécurité</i> <i>Finecorsa di sicurezza</i> <i>Interruptores de seguridad</i>	CTP-...	I, II, III	a, b, c, f, g, h	UQS 123565, ET 18080 *
	CTP-..AS...	I, II, III	a, b, c, d, f, g, h	UQS 125542
	CTP-LBI...	I, II, III	a, b, c, f, g, h	UQS 127798
	CEM-I2-...-C40...	I, II, III	a, b, c, f, g, h	UQS 124482
Sicherheitsschalter mit Not-Halt-Einrichtungen <i>Safety Switches with Emergency-Stop facilities</i> <i>Interrupteurs de sécurité avec appareillage arrêt d'urgence</i> <i>Finecorsa di sicurezza con dispositivi di arresto di emergenza</i> <i>Interruptores de seguridad con dispositivos de parada de emergencia</i>	CTP-...	I, II, III	a, b, c, e, f, g, h	UQS 123565
Betätiger <i>Actuator</i> <i>Actionneur</i> <i>Azionatore</i> <i>Actuador</i>	A-C-... A-C40-... A-TI-...	I, II, III } I, II, III	a, b, c, f, g, h	UQS 123565, ET 18080 * UQS 124482



**EUCHNER**

More than safety.

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

0340  
DGUV Test  
Prüf- und Zertifizierungsstelle Elektrotechnik  
Fachbereich ETEM  
Gustav-Heinemann-Ufer 130  
50968 Köln

Genehmigung der umfassenden Qualitätssicherung (UQS) durch die benannte Stelle 0035  
*Approval of the full quality assurance system by the notified body 0035*  
*Approbation du système d'assurance qualité complet par l'organisme notifié 0035*  
*Approvazione del sistema di garanzia di qualità totale da parte dell'organismo notificato 0035*  
*Aprobación del sistema de aseguramiento de calidad total por parte del organismo 0035 notificado*

TÜV Rheinland Industrie Service GmbH  
Alboinstr. 56  
12103 Berlin  
Germany

Die alleinige Verantwortung für die Ausstellung dieser Konformitätserklärung trägt der Hersteller:  
*This declaration of conformity is issued under the sole responsibility of the manufacturer:*  
*La présente déclaration de conformité est établie sous la seule responsabilité du fabricant:*  
*La presente dichiarazione di conformità è rilasciata sotto la responsabilità esclusiva del fabbricante:*  
*La presente declaración de conformidad se expide bajo la exclusiva responsabilidad del fabricante:*

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

Leinfelden, März 2019

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

i.A. Dipl.-Ing. Richard Holz  
Leiter Elektronik-Entwicklung  
Manager Electronic Development  
Responsable Développement Electronique  
Direttore Sviluppo Elettronica  
Director de desarrollo electrónico

i.A. Dipl.-Ing. (FH) Duc Binh Nguyen  
Dokumentationsbevollmächtigter  
Documentation manager  
Responsable documentation  
Responsabilità della documentazione  
Agente documenta



Euchner GmbH + Co. KG  
Kohlhammerstraße 16  
70771 Leinfelden-Echterdingen  
info@euchner.de  
www.euchner.com

Edition:  
2124662-04-05/19  
Title:  
Operating Instructions Transponder-Coded Safety Switch  
CTP-L-AS1  
(translation of the original operating instructions)  
Copyright:  
© EUCHNER GmbH + Co. KG, 05/2019

Subject to technical modifications; no responsibility is accepted for the accuracy of this information.