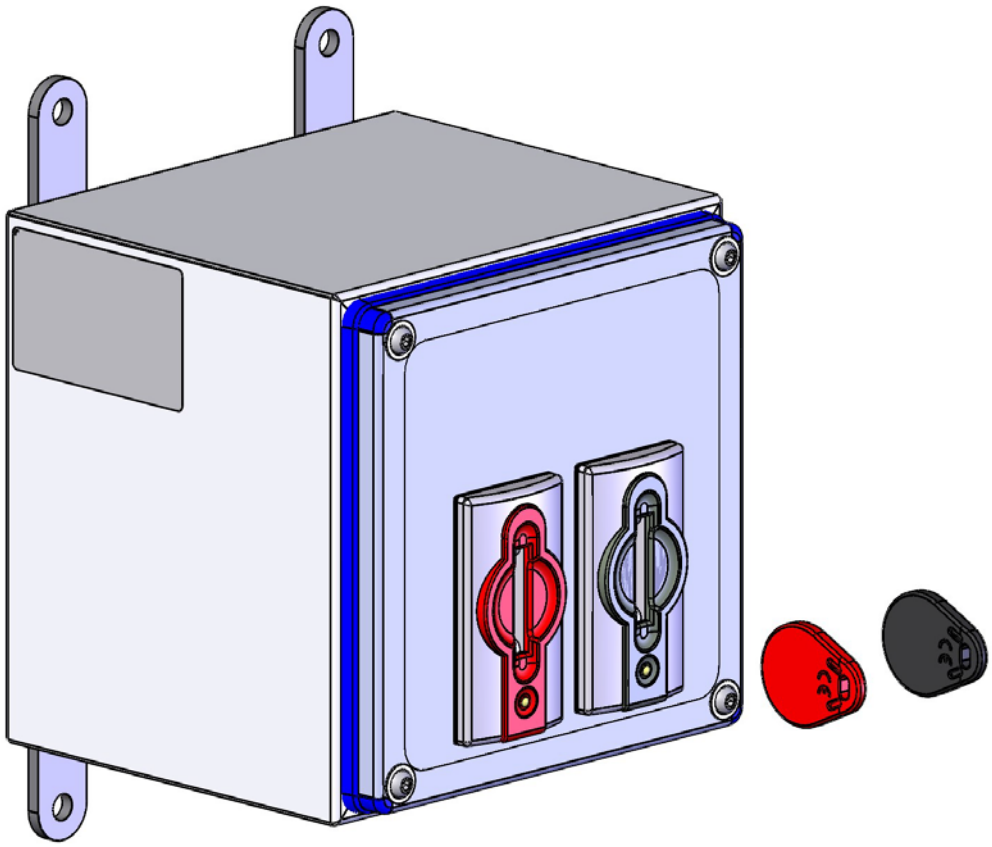
EUCHNER

Operating Instructions



Euchner Control Box

ECB-A-2K-A1-160397
ECB-A-2K-A2-160398

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Contents

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1. About this document

1.1. Scope

This document is valid for the Euchner Control Box:

- ECB-A-2K-A2-160398
- ECB-A-2K-A1-160397

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. These persons must also be familiar with the safety concept underlying this customer-specific solution.

1.3. Key to symbols

Symbol/depiction	Meaning
	Printed document
	Document is available for download at www.euchner.com
 **DANGER** **WARNING** **CAUTION**	**Signal word:** **Consequence if not observed:** **DANGER** Death or severe injuries **WARNING** Possibly death or severe injuries **CAUTION** Possibly minor injuries
 **NOTICE** **Important!**	**Signal word:** **NOTICE** Malfunction or device damage possible **Important!** Important information
Tip	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 (2533580)	(this document)	
Operating Instructions Transponder-Coded Safety Switch CTP-LBI-AP Unicode/Multi-code (2136918)	Operating Instructions	
Safety information (2525460)	Basic safety information	
Possibly enclosed data sheet	Item-specific information about deviations or additions	

Important!

Always read all documents to gain a complete overview of safe installation, setup and use of the device. The documents can be downloaded from www.euchner.com. For this purpose enter the doc. no. in the search box.

2. Correct use

In combination with a control system, the Euchner Control Box allows dangerous machine movements to be performed as long as all valid unique, transponder-coded keys (CKS keys) are inserted. If at least one CKS key is removed during operation, the two safety contacts are switched off and a stop command is triggered. The safety contacts remain switched off when the CKS key is removed. The installation cannot be restarted.

The system allows two CKS keys to be taught-in. When the CKS keys are removed from an ECB device, up to two persons can access the hazardous area for servicing. The ECB therefore performs the function of a safe lockout bar.

The ECB devices are also suitable for use as key transfer systems. When the CKS key is removed, the operator can enter the hazardous area safely and can use the same CKS key to start local machine functions via another ECB device.

The system can fulfill its safety function only if the users always carry their CKS keys with them when accessing the machine. When leaving the machine, they must ensure that there are no other persons in the machine. Only persons who have been instructed about using the ECB device safely may access the machine. The organization operating the machine must ensure that these guidelines are met.

With the ECB-A-2K-A1-160397 version, guard locking release is additionally prevented on the connected safety switch CTP-LBI-AP as long as all CKS keys are inserted in the device.

Each ECB device is a safety system, consisting of:

- A stainless steel housing
- 2 x CKS key adapter
- 2 x CKS keys (already taught-in); unique, transponder-coded devices (see chapter *12.1. Spare parts*)
- 1 x CES evaluation unit, unicode
- A transponder-coded safety switch with guard locking CTP-LBI-AP-U-HA-AZ-SA-127798 is additionally connected on ECB-A-2K-A1-160397 devices.

Before use, a risk assessment must be performed on the machine, e.g. in accordance with:

- EN ISO 13849-1
- EN ISO 12100
- EN IEC 62061

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

- EN ISO 13849-1
- EN ISO 14119
- EN 60204-1

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 *11. Technical data*).
- ECB devices must be used only in conjunction with the designated CKS keys from EUCHNER. On the use of different keys, EUCHNER provides no warranty for safe function. In the delivery state, the two CKS keys have already been taught-in.
- The safety switch CTP-LBI-AP 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.
- The ECB may be opened only to teach-in a new CKS key.
- The required teach-in function is described in chapter *9.1.2. Teach-in operation on the CES evaluation unit*.
- The internal wiring of the device must not be changed, except to perform a new teach-in operation.
- Only the manufacturer may replace device components. Please contact the manufacturer if servicing is required.

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Important!

- Information about safety switch CTP-LBI-AP-U-HA-AZ-SA-127798 is available in the operating instructions (doc. no. 2136918).
- If a data sheet is included with the product, the information on the data sheet applies.
- Only components that are intended for combination with the device may be used. Also observe the operating instructions for the components used (see chapter *1.4. Supplementary documents*).

3. Description of the safety function

The following applies to both ECB devices:

- Reliable detection of a non-inserted CKS key.

The uniquely coded CKS keys are tamper proof and safe to use:

- Each delivered CKS key possesses a unique electronic coding and so is a unique element in the system used.
- The code of a CKS key cannot be reprogrammed.
- Only the most recently taught-in CKS key is recognized as a valid CKS key.
- The CKS key color and the corresponding CKS key adapter cover color indicate the correct key position (red CKS key – red cover, black CKS key – black cover).
- Even if a transponder-coded CKS key belonging to another operator is used, the safety contacts of the CES evaluation unit are not switched and the installation cannot be started unexpectedly.
- Safety contacts 13 / 14 and 23 / 24 are opened if there is a fault in the CKS key adapter or CES evaluation unit.

3.1. Safety function for the ECB-A2 device

- Safety contacts 13 / 14 and 23 / 24 of the CES evaluation unit are opened when the CKS key is removed.

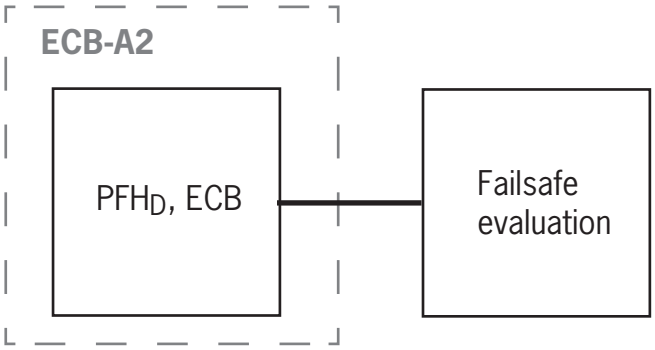

Figure 1: Safety function for ECB-A2

- Safety characteristics for the ECB-A2 device: category, Performance Level, PFH_D (see chapter *11.1. Technical data for ECB-A-2K-A2-160398*).

3.2. Safety function for the ECB-A1 device

- The safe OSSD semiconductor outputs of safety switch CTP-LBI-AP (FO1A and FO1B) are each connected in series with safety contacts 13 / 14 and 23 / 24 of the CES evaluation unit in the ECB device.
- Safety contacts 13 / 14 and 23 / 24 of the CES evaluation unit are opened when the CKS key is removed.

The transponder-coded safety switch CTP-LBI-AP is tamper proof and switches the safety outputs FO1A and FO1B only if the most recently taught-in CTP actuator is recognized as a valid actuator by CTP-LBI-AP.

The following applies here:

- The safety outputs are switched off when the guard is open (monitoring of the door position).

ⓘ	**Important!** The combination of safety switch CTP-LBI-AP with the ECB-A1 device means that CTP guard locking meets only the requirements for process protection.

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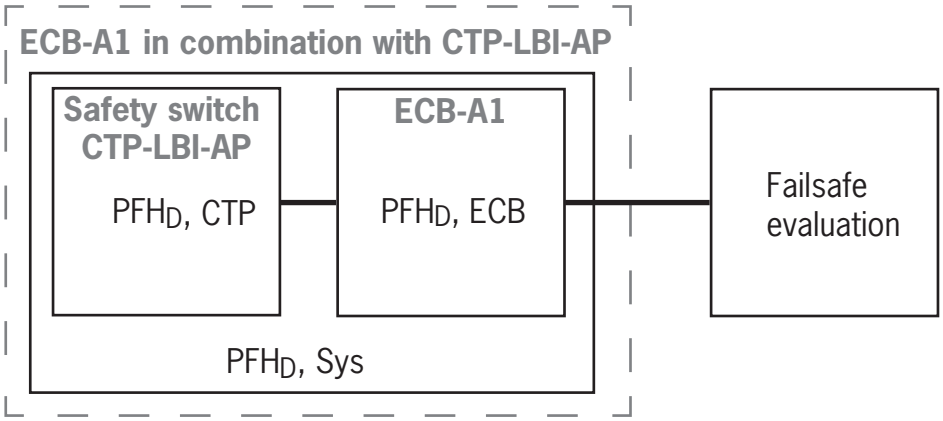

Figure 2: Safety function for ECB-A1

- Safety characteristics for the ECB-A1 device in combination with safety switch CTP-LBI-AP: category, Performance Level, PFH_D (see chapter *11.2. Technical data for ECB-A-2K-A1-160397*).

3.3. Control of guard locking for safety switch CTP-LBI-AP

Control of guard locking in combination with the ECB device is not a safety function.

4. Exclusion of liability and warranty

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

5. General safety precautions

The ECB device and safety switch CTP-LBI-AP 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 fulfill 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 may be triggered only by CKS keys specially designated for this purpose.
- 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 operational 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. You should archive a printed copy of the operating instructions. You can download the operating instructions from www.euchner.com.

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6. Function

	**Important!** The system can fulfill its safety function only if the users always carry their CKS keys with them when accessing the machine. When leaving the machine, they must ensure that there are no other persons in the machine. Only persons who have been instructed about using the ECB device safely may access the machine. The organization operating the machine must ensure that these guidelines are met.

6.1. Operation as an electronic lockout bar (version ECB-A-2K-A2-160398)

The device closes the floating, safe relay contacts 13 / 14 and 23 / 24 if the taught-in CKS keys are inserted into both CKS key adapters.

As soon as the CKS key is in the CKS key adapter, the LED on the CKS key adapter illuminates and data transmission to the CES evaluation unit begins. The read code is compared with the taught-in code in the CES evaluation unit.

When using the system, ensure that the respective CKS key is inserted into the associated CKS key adapter. If the CKS keys are inserted interchanged, safety contacts 13 / 14 and 23 / 24 do not switch through. CKS keys come in different colors to permit a visual allocation. The two safety contacts 13 / 14 and 23 / 24 are closed only when both CKS keys have been correctly inserted into the CKS key adapters of the same color (red or black).

When the CKS key is removed from the CKS key adapter, the white LED goes out, safety contacts 13 / 14 and 23 / 24 are opened and the installation is switched off. The installation is prevented from restarting when the CKS key is removed.

Pulsed signals from a safe control system can be connected to safety contacts 13 / 14 and 23 / 24 of the ECB-A2 device. The pulses are looped through if the relay contacts are closed. The pulsed signals can then be read back and evaluated by the control system to detect any short circuit immediately.

6.2. Operation as an electronic lockout bar in combination with guard locking (version ECB-A-2K-A1-160397)

In addition to the lockout bar function described above, this device features the option of controlling the guard locking of a safety switch CTP-LBI-AP. In this combination, guard locking fulfills only the requirements for process protection.

The task of the ECB-A1 is to ensure that guard locking can be released only if the following conditions are met simultaneously:

- A PLC signal is present at input IMP.
- At least one of the two CKS keys has been removed from the CKS key adapter.

As long as the operator carries the CKS key with him, there is no hazard for the operator due to unexpected machine start-up or being locked into the machine unintentionally.

Guard locking of safety switch CTP-LBI-AP cannot be activated or moved to locked position as long as at least one of the CKS keys is removed. Safety outputs FO1A and FO1B of safety switch CTP-LBI-AP are switched off as long as guard locking is released.

When the operator leaves the hazardous area and inserts the CKS key into the CKS key adapter (both keys are inserted again), guard locking is activated immediately if the door is closed. Safety switch CTP-LBI-AP is moved to locked position even if voltage is present at control input IMP. Safety contacts 13 / 14 and 23 / 24 are closed, and the installation can be started.

Safety switch CTP-LBI-AP additionally features a bistable guard locking function. It ensures that the guard locking remains in its most recent position in case of a power failure. Either “locked” or “released”.

When the operating voltage (24 V at U_B) is applied again after a voltage failure, the door locked by safety switch CTP-LBI-AP will be released only if the following conditions are met:

- A PLC signal is present at input IMP.
- At least one of the two CKS keys has been removed from the CKS key adapter.

These measures prevent persons from being unintentionally locked into the hazardous area, and the installation cannot be started.

6.3. Wiring diagrams

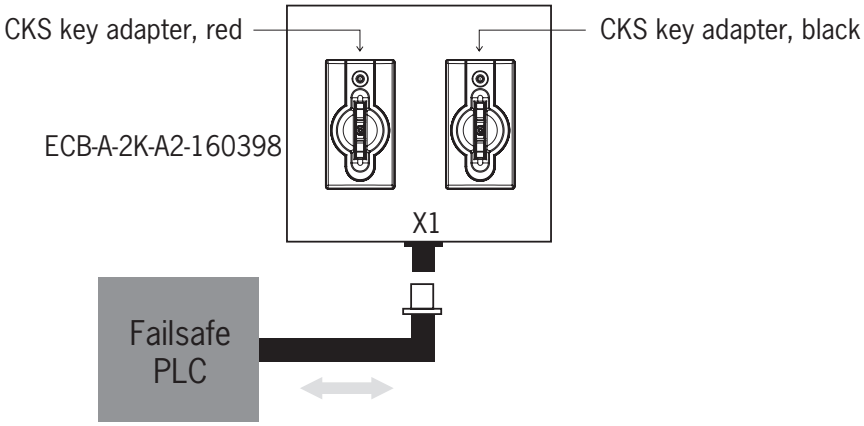

Figure 3: Wiring diagram for ECB-A2 device

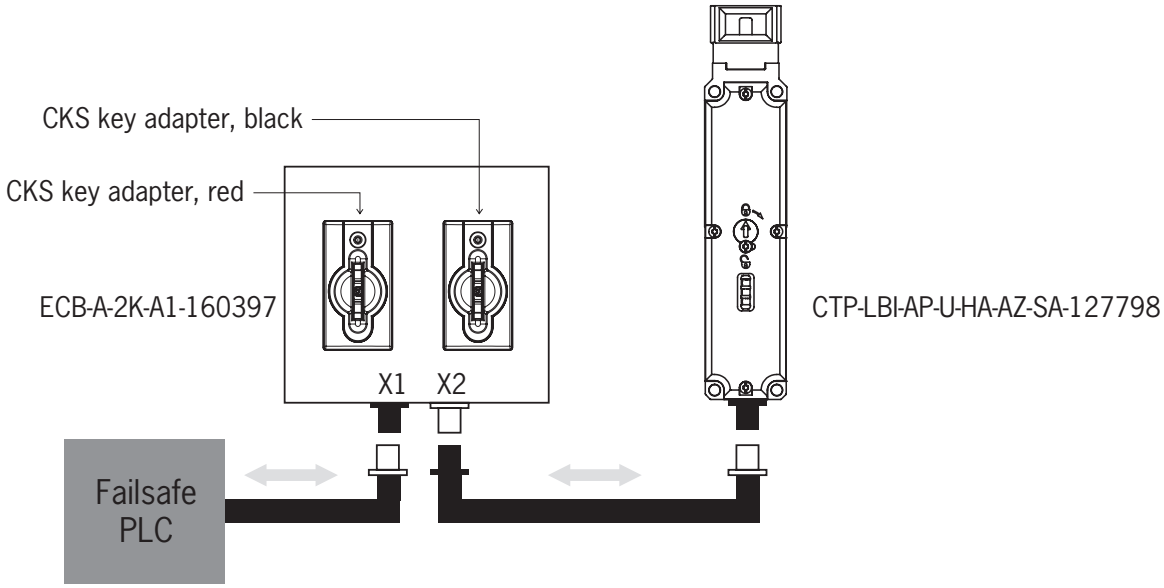

Figure 4: Wiring diagram for ECB-A1 device with safety switch CTP-LBI-AP

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7. Mounting

CAUTION

The ECB device or safety switch CTP-LBI-AP 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.

- The ECB may be opened only to teach-in a new CKS key.
- Observe the screw tightening torque for fastening the housing cover.

7.1. Dimension drawing

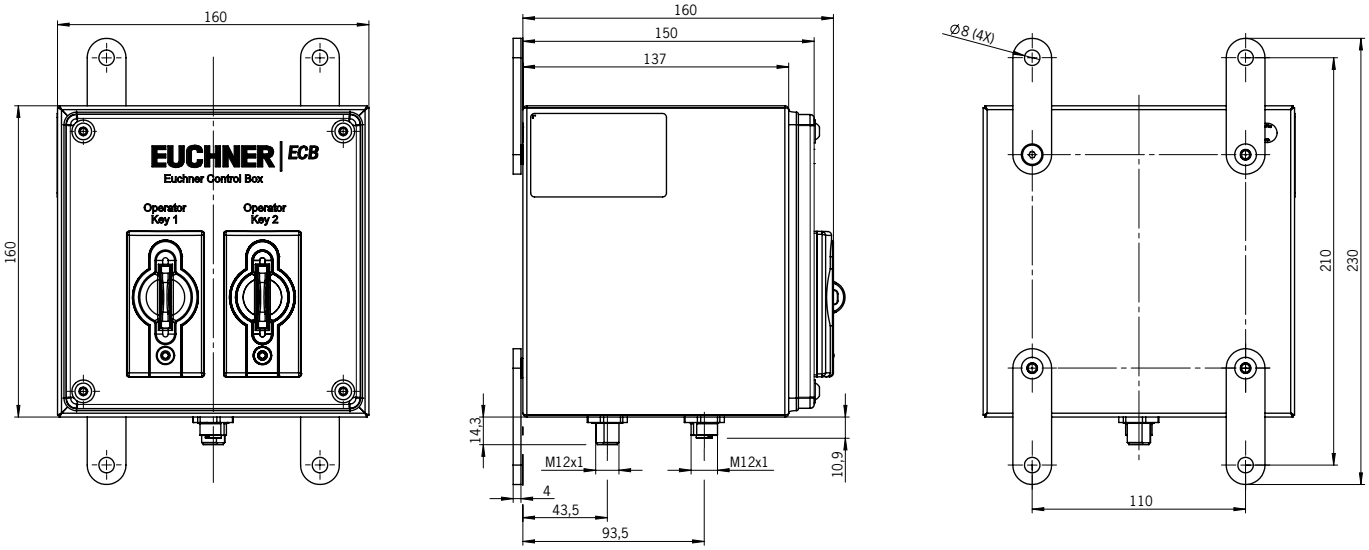

Figure 5: Dimension drawing for ECB device

7.2. Mounting the brackets

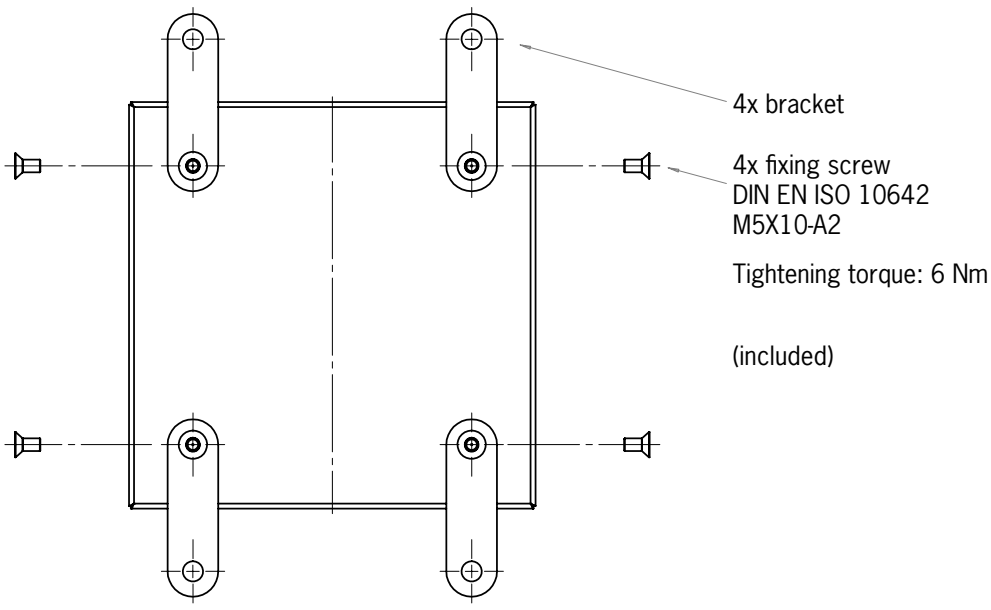

Figure 6: Fastening the brackets

7.3. Mounting the housing cover

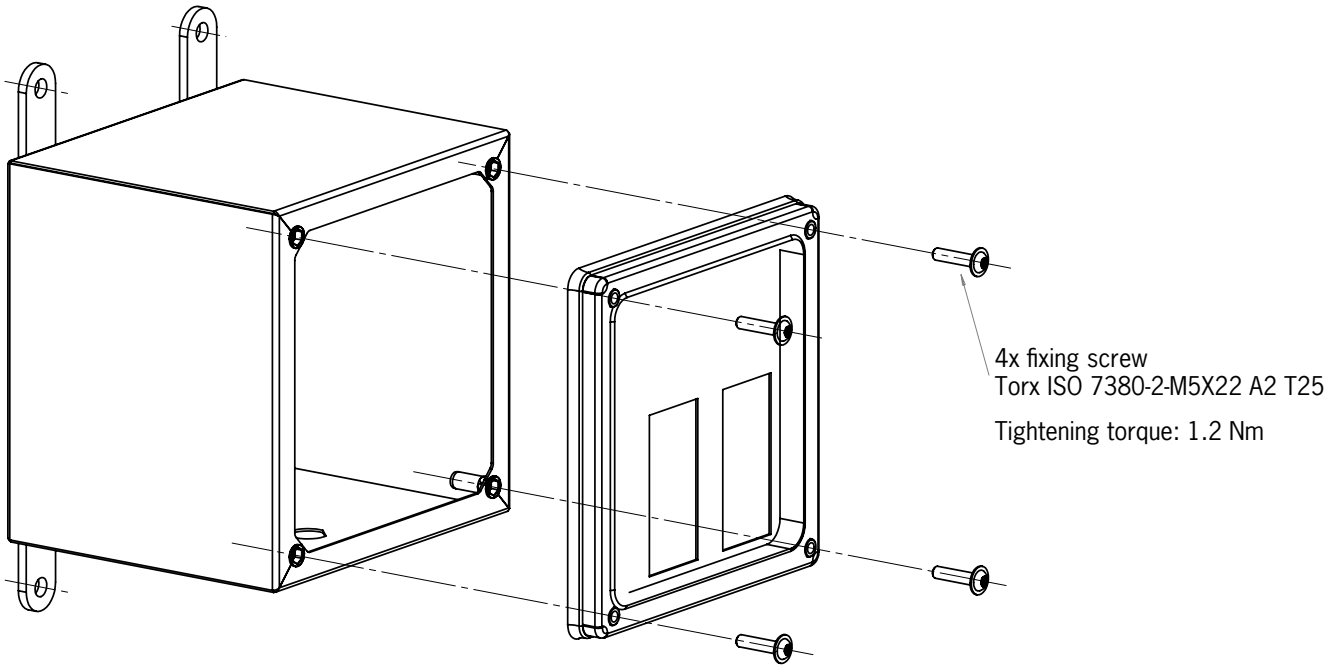

Figure 7: Fastening the cover

7.4. Mounting safety switch CTP-LBI-AP

	NOTICE Mount safety switch CTP-LBI-AP according to the specifications in Operating Instructions Transponder-Coded Safety Switch CTP-LBI-AP Unicode/Multicode (see chapter *1.4. Supplementary documents*).

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8. Electrical connection

8.1. Electrical connection of the ECB device

WARNING

In the event of a fault, loss of the safety function due to incorrect connection.

- Monitoring outputs must not be used as safety outputs.
- Lay the connecting cables with protection to prevent the risk of short circuits.

NOTICE

Risk of damage to equipment or malfunctions as a result of incorrect connection.

- All the electrical connections must either be isolated from the mains supply by a safety transformer according to IEC 61558-2-6 with limited output voltage in the event of a fault, or by other equivalent isolation measures.
- All electrical outputs must have an adequate protective circuit for inductive loads. The outputs must be protected with a free-wheeling diode for this purpose. The switch-on current may have to be limited for capacitive loads.
- 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 EN 60204-1:2006, section 4.4.2 (EMC).

Please pay attention to any interference fields from devices such as frequency converters or induction heating systems. Observe the EMC instructions in the manuals from the respective manufacturer.

8.2. Electrical connection of safety switch CTP-LBI-AP

NOTICE

Connect safety switch CTP-LBI-AP according to the specifications in Operating Instructions Transponder-Coded Safety Switch CTP-LBI-AP Unicode/Multicode (see chapter *1.4. Supplementary documents*).

Important!

If the safety switch CTP-LBI-AP does not appear to function when the operating voltage is applied (e.g. green STATE LED does not flash), the safety switch CTP-LBI-AP must be returned unopened to the manufacturer.

8.3. Notes on cULus

Important!

- This device is intended to be used with a Class 2 power source in accordance cULus with UL1310. As an alternative a LV/C (Limited Voltage/Current) power source with the following properties can be used:
  - This device shall be used with a suitable isolating source in conjunction with a fuse in accordance with UL248. The fuse shall be rated max. 3.3 A and be installed in the max. 30 V DC power supply to the device in order to limit the available current to comply with the cULus requirements. Please note possibly lower connection ratings for your device (refer to the technical data).
- For use and application as per the requirements of cULus 1) a connecting cable listed under the UL category code CYJV2 or CYJV must be used.

1) 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).

Important!

The components used have an cULus approval as per UL508.

8.4. Safety in case of faults

8.4.1. ECB-A2

- A short circuit between 13 / 14 (channel 1) and 23 / 24 (channel 2) can be detected only by means of external pulsing.
- A short circuit in the cable can be excluded by laying the cable with protection.
- The operating voltage U_B is reverse polarity protected.

8.4.2. ECB-A1

- A short circuit between 13 / 14 (channel 1) and 23 / 24 (channel 2) is detected by the pulsing of the OSSD outputs of safety switch CTP-LBI-AP.
- A short circuit in the cable can be excluded by laying the cable with protection.
- The operating voltage U_B and the control voltage IMP are reverse polarity protected.

8.5. Fusing of the power supply and the safety contacts

8.5.1. ECB-A2

- Provide external contact fuses (6 A gG fuse or 6 A circuit breaker, characteristic B or C) for relay outputs.
- The power supply must be protected with a max. 8 A fuse upstream of terminal U_B.

8.5.2. ECB-A1

- The power supply must be protected with a max. 8 A fuse, medium slow-blow, upstream of terminal U_B.

8.6. Requirements for connecting cables

⚠	**CAUTION** Risk of damage to equipment or malfunctions as a result of incorrect connecting cables. - Use connection components and connecting cables from EUCHNER.

ⓘ	**NOTICE** Observe the requirements for the connecting cables in Operating Instructions Transponder-Coded Safety Switch CTP-LBI-AP Unicode/Multicode (see chapter *1.4. Supplementary documents*).

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8.7. Cable outlets when using angled plugs

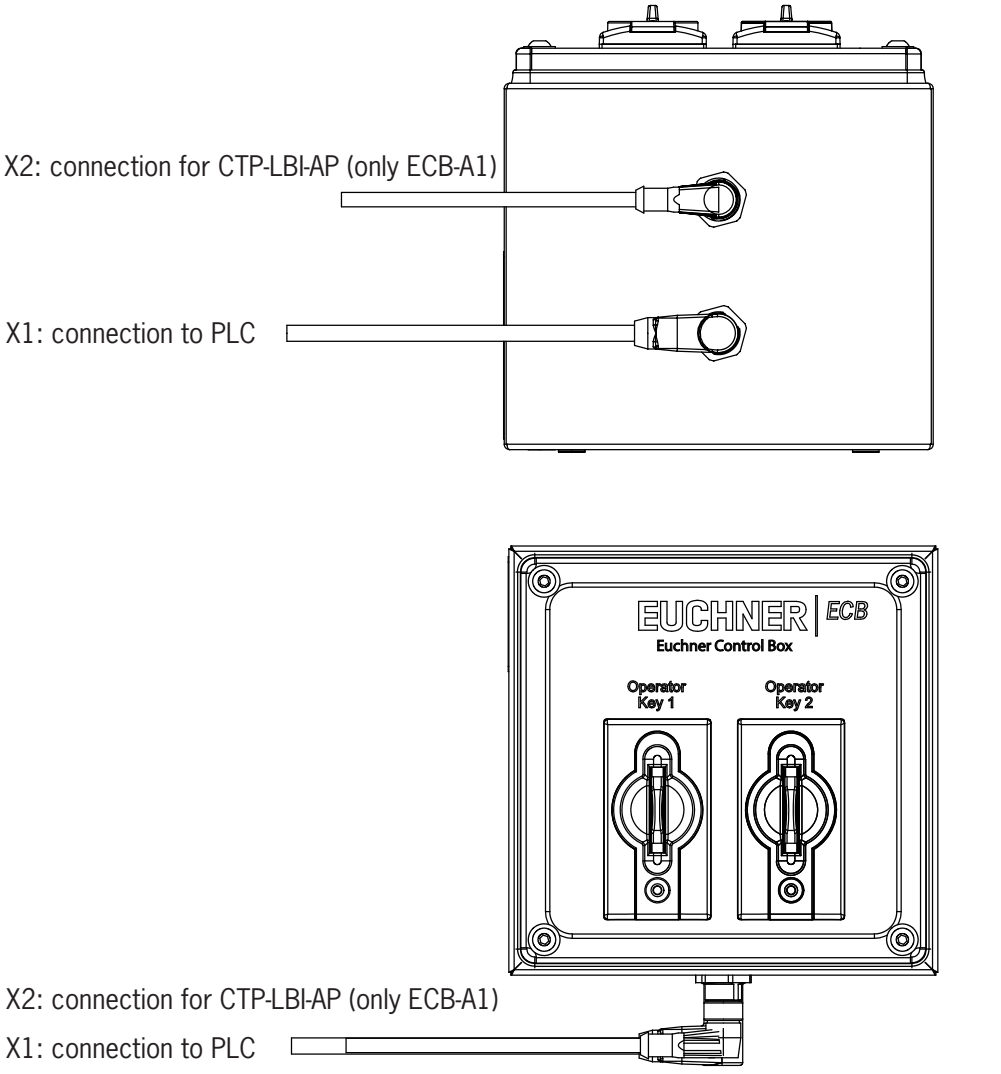


Figure 8: Cable outlets and installation orientation

8.8. Connector assignment

Table 1: Pin assignment for ECB-A-2K-A2-160398

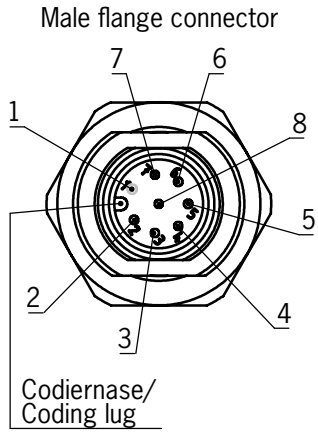
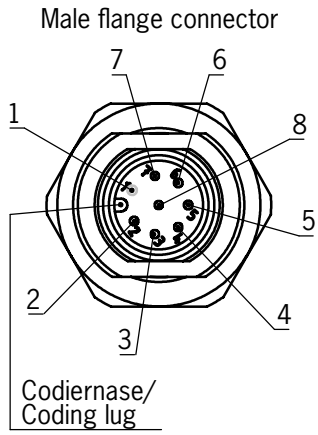
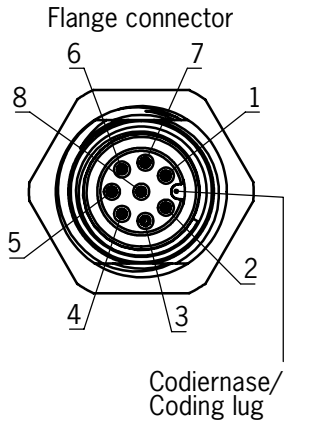
Connection to control system			
M12/8-pin	**Pin**	**Designation**	**Function**
	X 1.1	13	Enable input for channel 1
	X 1.2	U_B	Operating voltage, 24 V DC
	X 1.3	24	Safety output for channel 2
	X 1.4	14	Safety output for channel 1
	X 1.5	n. c.	-
	X 1.6	23	Enable input for channel 2
	X 1.7	0 V U_B	Operating voltage, 0 V DC
	X 1.8	n. c.	-

Table 2: Pin assignment for ECB-A-2K-A1-160397

Connection to control system			
M12/8-pin	**Pin**	**Designation**	**Function**
	X 1.1	IMP	Control input of guard locking solenoid, 24 V DC
	X 1.2	U_B	Operating voltage, 24 V DC
	X 1.3	14	Safety output for channel 1
	X 1.4	24	Safety output for channel 2
	X 1.5	OI	Diagnostic output
	X 1.6	OD	Door monitoring output
	X 1.7	OL	Guard locking monitoring output
	X 1.8	0 V U_B	Operating voltage, 0 V DC

Connection for safety switch CTP-LBI-AP			
M12/8-pin	**Pin**	**Designation**	**Function**
	X 2.1	OMP	Control output for guard locking solenoid CTP, 24 V DC
	X 2.2	U_B	Operating voltage, 24 V DC
	X 2.3	13	Connection for safety output CTP, channel 1
	X 2.4	23	Connection for safety output CTP, channel 2
	X 2.5	OI	Connection for diagnostic output CTP
	X 2.6	OD	Connection for door monitoring output CTP
	X 2.7	OL	Connection for monitoring output of CTP guard locking
	X 2.8	0 V U_B	Operating voltage, 0 V DC

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8.9. Wiring diagrams

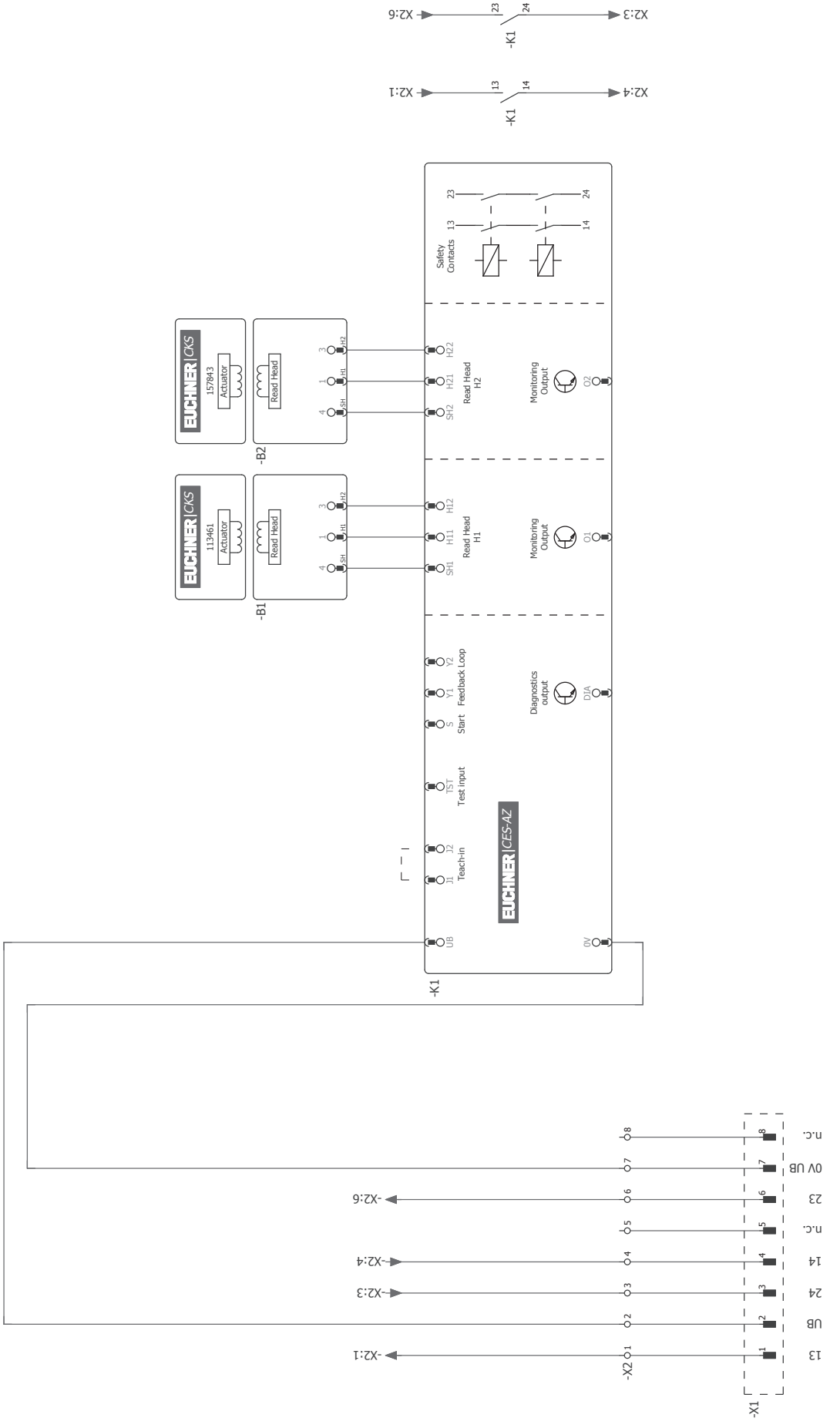

Figure 9: Wiring diagram for version ECB-A-2K-A2-160398

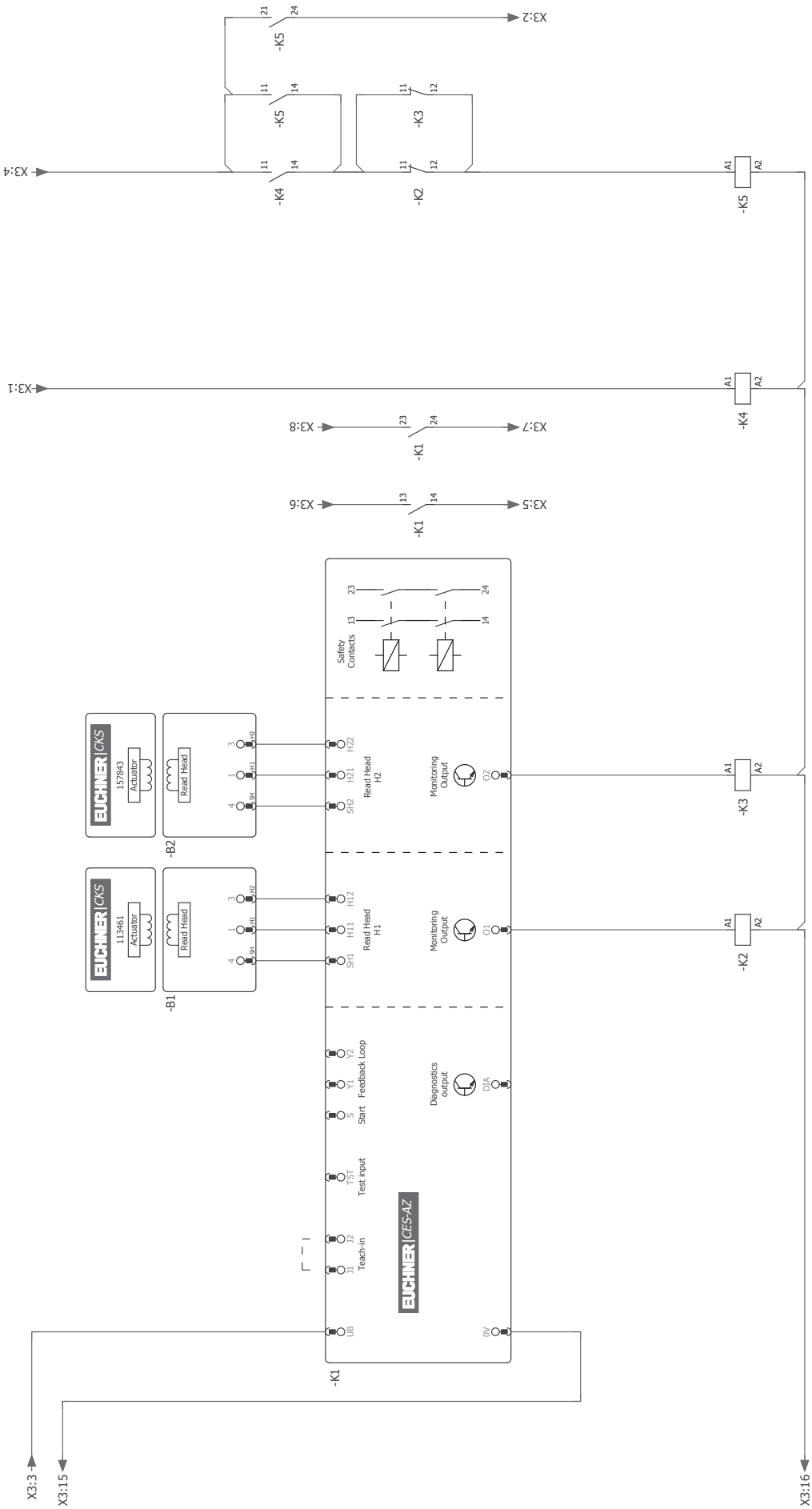

Figure 10: Wiring diagram for version ECB-A-2K-A1-160397, part 1

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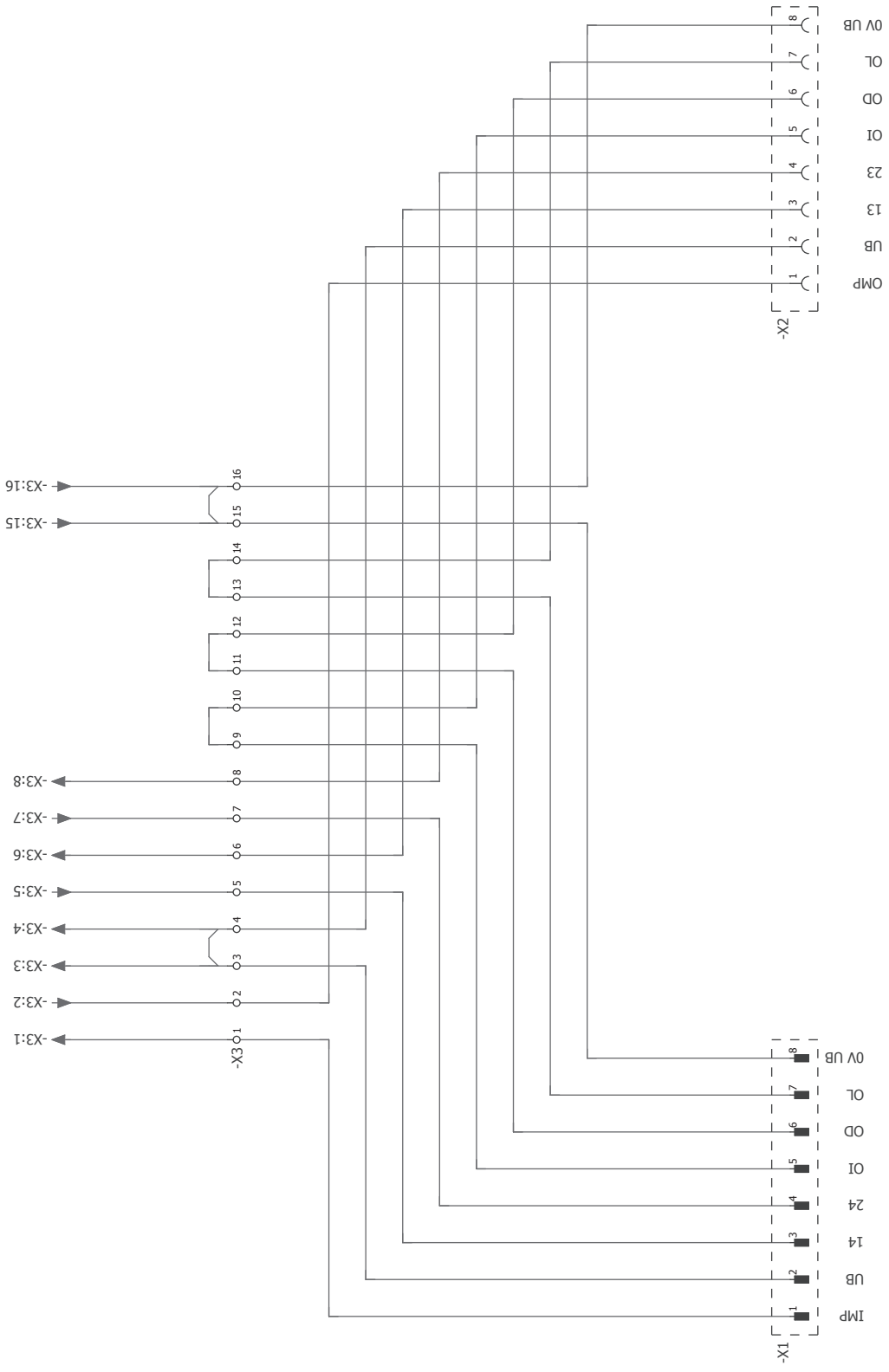

Figure 11: Wiring diagram for version ECB-A-2K-A1-160397, part 2

9. Setup

9.1. Teaching-in a new CKS key

Teach-in of CKS keys can be repeated any number of times. Observe the teach-in operation in accordance with section *9.1.2. Teach-in operation on the CES evaluation unit* for this purpose. Faulty CKS keys can thus be replaced at any time. In the delivery state, the keys in the evaluation unit have already been taught-in.

9.1.1. LED indicators on the CES evaluation unit

Designation	Color	Meaning
State	green	Status indication (multifunction display using flashing modes)
OUT	yellow	Safety circuit closed
DIA	red	‣ Operating fault or ‣ External fault (fault in the feedback loop) or ‣ Teach-in operation not valid or ‣ Internal device fault or ‣ TST input activated (function test active)

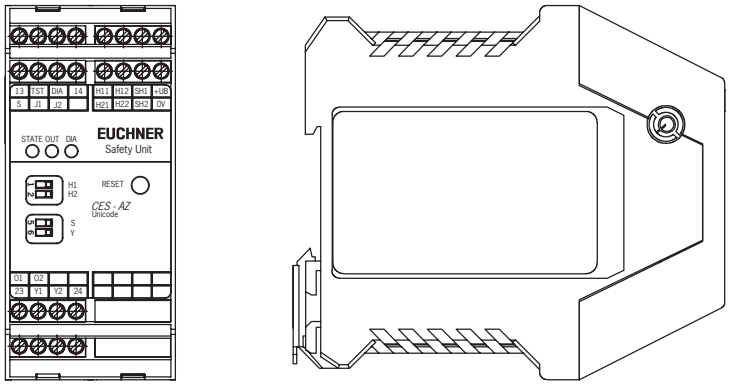

Figure 12: Evaluation unit CES-AZ-AES-02B

9.1.2. Teach-in operation on the CES evaluation unit

A new CKS key can be taught-in on the CES evaluation unit if necessary.

During the teach-in operation the safety outputs are open. The system is in the safe state.

Important!

- CKS keys must not be removed during the teach-in operation.
- If the teach-in operation is interrupted, the CES evaluation unit switches to the safe fault state (diagnostic LED illuminates) and signals this operating fault with the STATE LED by 3 short flashes that are repeated every 1 second. The teach-in operation must be repeated.
- The number of teach-in operations is unlimited. The CES evaluation unit can be re-configured as often as required.
- CKS key adapters cannot be interchanged without a renewed teach-in operation.
- If a CKS key is not taught-in, it is not recognized by the respective CKS key adapter.
- Even if only one new CKS key needs to be taught-in, a complete new teach-in operation must be carried out.
- Do not change DIP switches during operation.

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To trigger a teach-in operation, the user must perform the following actions in the stipulated order:

1. Prepare for teach-in operation
 - Switch off power supply U_B
 - Insert both keys into the key adapter. Observe the color assignment.
 - Remove the ECB device housing cover
 - Check the positions of the DIP switches:

Switch position left (OFF)	Switch position right (ON)
S and Y	H1 and H2

 - Fit a jumper between terminals J1 and J2

NOTICE

Do not change the configuration on the DIP switches.

‣ On switches 1 and 2, the correct switch position is right (ON).

2. Start teach-in operation
 - Switch on operating voltage
 - Wait for self-test (STATE LED flashes for approx. 10 seconds at 15 Hz)
 - Teach-in operation starts (STATE LED flashes at approx. 1 Hz)
 - Wait for acknowledgment of the teach-in operation (STATE LED goes out after approx. 10 seconds)
3. End teach-in operation
 - Remove jumper between J1 and J2
 - Press reset button or interrupt operating voltage for at least 10 seconds
 - Wait for self-test (STATE LED flashes for approx. 10 seconds at 15 Hz)
4. Fit the ECB device housing cover
 - Tighten cover screws to 1.2 Nm.
5. Perform a function check (see next section).

9.2. Functional check

After a new CKS key has been taught-in, the safety function must be fully checked. Proceed as follows:

⚠	**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 valid accident prevention regulations.

9.2.1. Functional check for the ECB-A2 device

1. Switch on operating voltage.
   - The machine must not start automatically.
   - The CES evaluation unit carries out a self-test.
2. Insert both CKS keys.
   - The LEDs on the CKS key adapters illuminate white.
3. Enable operation in the control system.
4. Remove CKS key.
   - The machine must switch off, and it must not be possible to start it unless both CKS keys are inserted.
   - The LED on the CKS key adapter goes out.

9.2.2. Functional check for the ECB-A1 device

1. Switch on operating voltage.
   - The CES evaluation unit carries out a self-test.
   - The safety switch CTP-LBI-AP carries out a self-test.
2. Insert both CKS keys.
   - The LEDs on the CKS key adapters illuminate white.
   - The machine must not start automatically.
3. Close the guard
   - Guard locking is activated automatically.
   - The green STATE LED and the yellow LOCK LED on safety switch CTP-LBI-AP are illuminated continuously.
   - It must not be possible to open the guard.
   - The machine must not start automatically.
4. Enable operation of the machine in the control system.
   - Machine enters normal operation.
5. Switch off operation of the machine in the control system and switch on control input IMP.
   - The guard remains locked as long as both CKS keys are inserted into the CKS key adapter.
6. Remove one CKS key
   - Guard locking is released
   - It must not be possible to start the machine as long as guard locking is released.
   - Guard locking remains released as long as at least one CKS key is removed, even if the IMP signal is switched off after the key is removed (latching).
7. Repeat steps 2 to 6 individually for each CKS key.

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10. System status table for the CES evaluation unit

Operating mode	LED indicator STATE (green)	OUT (yellow)	DIA (red)	State
Teach-in operation	1 Hz	○	○	Teach-in operation
	○	○	○	Acknowledgment of completed teach-in operation
Normal operation	15 Hz (10 s)	○	○	Self-test, duration approx. 10 seconds, is performed after the application of the operating voltage U_B
	☀	○	○	Normal operation, not all CKS keys inserted
	☀	☀	○	Normal operation, all CKS keys inserted
Fault display	○	○	☀	Component failure in the device or excessively high external interference (EMC)
Operating fault	3x	○	☀	Configuration fault: **Teach-in operation must be performed again** Possible causes: - State change during the teach-in operation - The DIP switch setting and the configuration did not match during the teach-in operation - DIP switch setting has been changed without teach-in operation - The jumper (J1, J2) was fitted with power supply switched on

Key to symbols	
N	0 V or not connected
1	24 V
0	0 V
○	LED not illuminated
☀	LED illuminated
15 Hz (10 s)	LED flashes for 10 seconds at 15 Hz
3x	LED flashes three times, and this is then repeated
X	Any state

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.

NOTICE

The CKS key adapter has an LED. The LED lights up when the CKS key is inserted.

11. Technical data

NOTICE

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

11.1. Technical data for ECB-A-2K-A2-160398

Parameter	Value			Unit
	min.	typ.	max.	
Housing material	Stainless steel 1.4301			
Housing seal	Silicone			
Safety class acc. to EN IEC 61558	III			
Dimensions	160 x 160 x 150			mm
Weight	Approx. 2.5			kg
Ambient temperature at U_B = DC 24 V	-20	-	45	°C
Atmospheric humidity, not condensing	-	-	80	%
Degree of protection	IP65			
Degree of contamination	3			
Operating voltage U_B (regulated, residual ripple <5%)	21	24	27	V DC
For the approval acc. to cULus the following applies	Operation only with UL class 2 power supply or equivalent measures			
Current consumption I_B (with relay energized)	-	150	-	mA
External fuse (operating voltage U_B)	0.4	-	8	A
Safety outputs	2 (relays with internally monitored contacts)			
Switching current (relay outputs) - at switching voltage AC/DC 5 ... 30 V	10	-	1500	mA
External fuse (safety circuit) acc. to EN 60269-1	6 AgG or 6 A circuit breaker (characteristic B or C)			
Utilization category acc. to EN 60947-5-1	AC-12 30 V 0.3 A, DC-12 30 V 0.3 A, AC-12 30 V 1.5 A, DC-12 30 V 1.5 A, DC-13 24 V 1.5 A			
Rated insulation voltage U_i	75			V DC
Rated impulse withstand voltage U_{imp}	0.8			kV
Rated conditional short-circuit current	100			A
Resilience to vibration	Acc. to EN 60947-5-2			
Mechanical operating cycles (safety relay)	10 x 10^6			
Discrepancy time of the operating points of both relays	-	-	25	ms
Ready delay 1)	-	10	12	s
EMC protection requirements	Acc. to EN 60947-5-3			
Reliability values acc. to EN ISO 13849-1 as a function of the switching current at 24 V DC	Monitoring of the CKS keys ≤ 0.1 A		≤ 1 A	
Category	4			
Performance Level (PL)	e			
PFH_D, ECB	1.9 x 10^{-8}			
Mission time	20			years
Number of switching cycles/year	760,000		153,000	
Diagnostic coverage DC	99			%

1) After the operating voltage is switched on, the relay outputs are switched off and the monitoring outputs are set to LOW potential during the ready delay. For the visual indication of the delay, the green STATE LED flashes at a frequency of approx. 15 Hz.

EN

11.2. Technical data for ECB-A-2K-A1-160397

Parameter	Value			Unit
	min.	typ.	max.	
Housing material		Stainless steel 1.4301		
Housing seal		Silicone		
Safety class acc. to EN IEC 61558		III		
Dimensions		160 x 160 x 150		mm
Weight		Approx. 2.5		kg
Ambient temperature at U_B = 24 V DC	-20	-	45	°C
Atmospheric humidity, not condensing	-	-	80	%
Degree of protection		IP65		
Degree of contamination		3		
Operating voltage U_B (regulated, residual ripple <5%)	21	24	27	V DC
For the approval acc. to cULus the following applies		Operation only with UL class 2 power supply or equivalent measures		
Current consumption I_B (with relay energized) 1)	-	650	-	mA
External fuse (operating voltage U_B)	1.2	-	8	A
Safety outputs		2 semiconductor outputs of safety switch CTP-LBI-AP are connected in series with one relay contact each (relay with internally monitored contacts)		
Switching current (semiconductor outputs)	10	-	150	mA
External fuse (safety circuit) acc. to EN 60269-1		6 AgG or 6 A circuit breaker (characteristic B or C)		
Utilization category acc. to EN 60947-5-1		DC-13 24 V 150 mA		
Rated insulation voltage U_i		75		V DC
Rated impulse withstand voltage U_{imp}		0.5		kV
Rated conditional short-circuit current		100		A
Resilience to vibration		Acc. to EN 60947-5-2		
Mechanical operating cycles (relays)		10×10^6		
Discrepancy time of the operating points of both relays	-	-	25	ms
Ready delay 2)	-	10	12	s
EMC protection requirements		Acc. to EN 60947-5-3		
Reliability values acc. to EN ISO 13849-1 as a function of the switching current at 24 V DC		Monitoring of the CKS keys and the guard position ≤ 0.1 A		
Category		4		
Performance Level (PL)		e		
PFH_D, Sys		2.3×10^{-8}		
Mission time		20		years
Number of switching cycles/year		760,000		
Diagnostic coverage DC		99		%

1) Without taking into account the load currents on the monitoring outputs.
2) After the operating voltage is switched on, the relay outputs are switched off and the monitoring outputs are set to LOW potential during the ready delay. For the visual indication of the delay, the green STATE LED flashes at a frequency of approx. 15 Hz.

NOTICE

Technical data for transponder-coded safety switch CTP-LBI-AP unicode/multicode can be found in the operating instructions (see chapter *1.4. Supplementary documents*).

12. Ordering information and accessories

Tip!

Suitable accessories, e.g. cables or assembly material, can be found at 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.”

12.1. Spare parts

Series	Design	Order no./item	
CKS-A-BK1-...	CKS key, color: red	**113461** CKS-A-BK1-RD-113461	For detailed information, enter the order number for the product in the search box at www.euchner.com.
	CKS key, color: black	**157843** CKS-A-BK1-BK-157843	

13. Inspection and service

WARNING

Loss of the safety function because of damage to the device.
- In case of damage, the entire device must be replaced.
- 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 chapter *9.2. Functional check*)
- Check the secure mounting 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.
The current version number in the format (VX.X.X) can also be found on the device.

14. Service

If servicing is required, please contact:

EUCHNER GmbH + Co. KG

Kohlhammerstraße 16

70771 Leinfelden-Echterdingen

Service telephone:

+49 711 7597-500

E-mail:

support@euchner.de

Internet:

www.euchner.com

EN

15. Declaration of conformity

CE

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

2533405-03-01/20

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
	Machinery directive	*2006/42/EC*
	Directive Machines	*2006/42/CE*
	Direttiva Macchine	*2006/42/CE*
	Directiva de máquinas	*2006/42/CE*
II:	EMV Richtlinie	2014/30/EU
	EMC Directive	*2014/30/EU*
	Directive de CEM	*2014/30/UE*
	Direttiva EMV	*2014/30/UE*
	Directiva CEM	*2014/30/UE*
III:	RoHS Richtlinie	2011/65/EU
	RoHS directive	*2011/65/EU*
	Directive de RoHS	*2011/65/UE*
	Direttiva RoHS	*2011/65/UE*
	Directiva RoHS	*2011/65/UE*

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	d:	EN 55011:2009/A1:2010 (ISM)
b:	EN ISO 13849-1: 2015	e:	EN 61000-6-2:2005
c:	EN 60204-1:2018	f:	EN 50581:2012 (RoHS)

Bezeichnung der Bauteile *Description of components* *Description des composants* *Descrizione dei componenti* *Descripción de componentes*	**Type** *Type* *Type* *Tipo* *Typo*	**Richtlinie** *Directives* *Directive* *Direttiva* *Directivas*	**Normen** *Standards* *Normes* *Norme* *Estándares*	**Zertifikats-Nr.** *No. of certificate* *Numéro du certificat* *Numero del certificato* *Número del certificado*
Euchner Control Box *Euchner Control Box* *Euchner Control Box* *Euchner Control Box* *Euchner Control Box*	ECB...	I, II, III	a, b, c, d, e, f	UQS 2535025
Schlüssel *Key* *Clé* *Chiave* *llave*	CKS-A-B...	I, II, III	a, b, c, d, e, f	UQS 2535025

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

0035
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
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Leinfelden, Januar 2020

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