EUCHNER

Operating Instructions

Key Adapter

CKS-K-AS2A-U-C20-PC (Unicode)

EN

Contents

1. About this document

1.1. Scope

These operating instructions are valid for all CKS-K-AS2A-U-C20-PC. These operating instructions, the document *Safety information* 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 www.euchner.com
 **DANGER WARNING CAUTION**	Safety precautions **Danger** of death or severe injuries **Warning** about possible injuries **Caution** slight injuries possible
 **NOTICE Important!**	**Notice** about possible device damage **Important** information
Tip	Useful information

1.4. Supplementary documents

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

Document title (document number)	Contents	
Safety information (2525460)	Basic safety information	
Operating instructions (2123914)	(this document)	
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.

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2. Correct use

EUCHNER key adapters series CKS-K-AS are operated as a slave on the safety bus AS-Interface Safety at Work

This safety component allows dangerous machine movements to be performed as long as a valid key is inserted. A stop command is triggered if the key is removed during the dangerous machine function.

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

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

Correct use includes observing the relevant requirements for installation and operation, e.g.

- EN ISO 13849-1
- EN 60204-1

The key adapter 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.

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 technical data).
- It is only allowed to use components that are permissible in accordance with the table below.

Table 1: Possible combinations for CES components

Key adapter	Key
	CKS-A-BK1-RD-113461
CKS-K-AS2A-U-C20-PC	●

Key to symbols	●	Combination possible

3. Description of the safety function

The safety function is defined by the related application.

- Device safety function:
  - The zero sequence is sent if the key is removed (see chapter *6.1. Switching states on page 6*).
- Safety characteristics: category, Performance Level, PFH_D (see chapter *11. Technical data on page 13*).

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

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

Check the safe function of the safeguard 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 safeguard 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.

- The switching operation may be triggered only by keys specially designated for this purpose.
- The key must be completely pulled out of the key adapter in order to switch the safety circuit off safely.
- Mounting, electrical connection and setup only by authorized personnel possessing the following knowledge:
  - specialist knowledge in handling safety components
  - knowledge about the applicable EMC directives
  - 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. For this reason 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

The key adapter CKS can be used as a lockout bar, for example. As soon as the key is in the key adapter, this is reported via the AS-Interface bus. Each delivered key possesses a unique electronic coding and so is a unique element in the system used.

The code of a key cannot be reprogrammed.

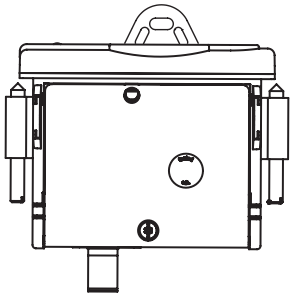
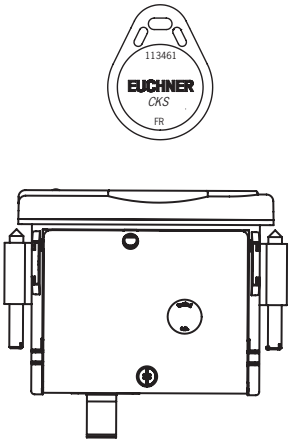
If a permissible code is detected, a bit sequence is sent via the AS-Interface bus to signal that the key is inserted.

The zero sequence is sent via the AS-Interface bus when the key is removed from the key adapter. The machine cannot be started.

If there is a fault in the key adapter, the zero sequence is sent and the LED illuminates.

6.1. Switching states

The detailed switching states for your key adapter can be found in the system status table. All indicator LEDs are described there.

	Key inserted	**Key removed**
		
LED indicator	green	yellow
D0, D1, D2, D3	Code sequence	Zero sequence

7. Mounting

NOTICE

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

- To achieve the degree of protection IP67, it is necessary to install the key adapter in a clean, flat metal plate at least 2 mm thick and to tighten the screws with a tightening torque of 0.25 ... 0.35 Nm.
- The device may be damaged if the tightening torque exceeds 0.35 Nm.
- Suitable strain relief must be provided for the connecting cables in order to avoid damage to the connection sockets or malfunctions.

The key adapter is intended for mounting in control panels with a cut-out measuring 33 mm x 68 mm according to DIN IEC 61554. The device is fastened using screw clamp elements from the rear side of the panel.

1. Insert the key adapter, with seal already bonded in place, into the mounting cut-out from the front.
2. Insert screw clamp elements into the housing of the key adapter from the side up to the stop and tighten with 0.25 …0.35 Nm.
3. After mounting, again check the key adapter for firm seating and correct sealing of the front panel.

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8. Electrical connection

CAUTION

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

- Power devices which are a powerful source of interference must be installed in a separate location away from the input and output circuits for signal processing. The cable routing for safety circuits should be as far away as possible from the cables of the power circuits.
- 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).
- 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.

Important!

If the device does not appear to function when the operating voltage is applied (e.g. green LED does not flash), the key adapter must be returned unopened to the manufacturer.

8.1. Notes about cULus

Important!

- This device is intended to be used with a *Class 2* power source in accordance with UL1310. As an alternative an 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 applications as per the requirements of cULus [1)], a connecting cable listed under the UL category code CYJV2 or CYJV must be used.

1) Notice on the scope of the UL approval: only for applications as per NFPA 79 (Industrial Machinery). The devices have been tested as per the requirements of UL508 and C SA/ C22.2 no. 14 (protection against electric shock and fire).

8.2. Setting the AS-Interface address

The address can be set prior to or after mounting.

The AS-Interface address of the key adapter 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 ASi connection on the key adapter using a programming cable.

The AS-Interface address can also be set directly on the AS-Interface bus with a master.

The default setting for the address on delivery is 0.

8.3. Configuration in the AS-Interface safety monitor

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

8.3.1. Dual-channel positively driven

The key adapter is configured in the AS-Interface safety monitor with the AS-Interface address set as follows:

- Dual-channel positively driven
- With or without start-up test

8.4. Connector assignment of key adapter CKS-K-AS2A-U-C20-PC

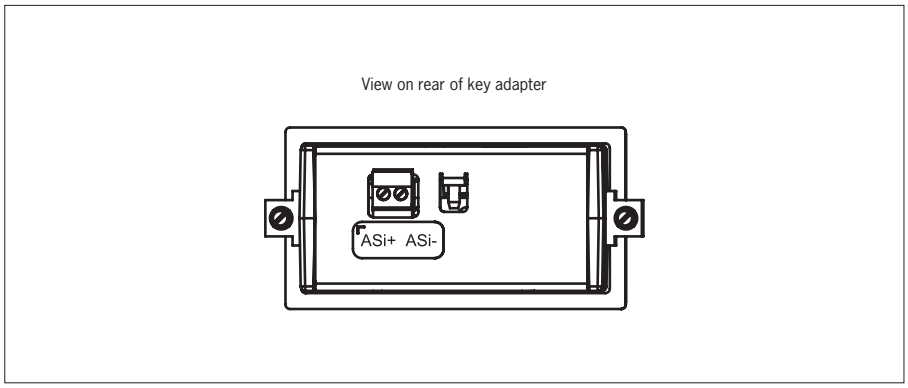

Figure 1: Terminal assignment, AS-Interface connection terminal

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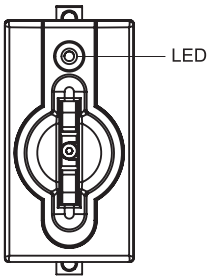
9. Setup

9.1. LED indicator

You will find a detailed description of the signal functions in chapter *10. System status table on page 12*.

LED color	Meaning
Green	Key inserted
Yellow	Readiness for operation
Red	Fault



9.2. Teach-in function for key

The key must be allocated to the key adapter using a teach-in function before the system forms a functional unit.

The zero sequence is sent during the teach-in operation.

Important!

- The teach-in operation may be performed only if the device functions flawlessly. The red LED must not be illuminated.
- The key adapter disables the code of the previous key if teach-in is carried out for a new key. Teach-in is not possible again immediately for this device if a new teach-in operation is carried out. The disabled code is released again in the key adapter only after a third code has been taught-in.
- The key adapter can be operated only with the last key taught-in.
- If the key adapter detects the key that was most recently taught-in when in the teach-in standby state, this state is ended immediately and the key adapter changes to normal operation.
- If the key to be taught-in is within the actuating range for less than 60 s, it will not be activated and the most recently taught-in key will remain saved.

9.2.1. Preparing device for teach-in operation and teaching-in key

1. Insert new key
2. Connect AS-Interface bus to the key adapter.

➡ Teach-in operation starts, the LED flashes green (approx. 1 Hz). During the teach-in operation, the key adapter checks whether the key is a disabled key. Provided this is not the case, the teach-in operation is completed after approx. 60 seconds, and the green LED goes out. The new code has now been stored, and the old code is disabled.

3. To activate the new key code from the teach-in operation in the key adapter, the key adapter must then be disconnected from the AS-Interface bus for min. 3 seconds.

9.3. 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 valid accident prevention regulations.

9.3.1. 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 key adapter carries out a self-test. The LED then flashes green (3 min).

2. Insert key.

➡ The LED illuminates green.

3. Enable operation in the control system.
4. Remove key.

➡ The machine must switch off and it must not be possible to start it as long as a key is not inserted.

➡ The LED illuminates yellow.

Repeat steps 2 - 4 for each key adapter.

10. System status table

Operating mode	Key inserted	CKS LED indicator: Green	CKS LED indicator: Yellow	CKS LED indicator: Red	State
Normal operation	Yes	☀		○	Normal operation, key inserted
	No	☀ 1 x		○	Normal operation, no key taught-in
	No	○	☀	○	Normal operation, no key inserted, AS-i bus connected and in operation
	Yes	○	☀ 1 Hz	○	Normal operation, key inserted but not taught-in, AS-i bus connected and in operation
Teach-in standby	No	☀ 3 x		○	Device is ready for teach-in of another key (only short time after power-up)
Setup	Yes	☀ 1 Hz		○	Teach-in operation
	X	○		○	Positive acknowledgment after completion of teach-in operation or device not connected
Fault display	Yes	☀ 3 x		☀	Defective key (e.g. fault in code or code cannot be read)
	X	○		☀	Internal fault (e.g. component faulty, data error)
	X	☀ 4 x	○	☀	Error: AS bus connected, no communication with the master

Key to symbols	
○	LED not illuminated
☀	LED illuminated
☀ 10 Hz (8 s)	LED flashes for 8 seconds at 10 Hz
☀ 3 x	LED flashes three times, and this is then repeated
X	Any state

After the cause has been remedied, faults can generally be reset by removing the key and inserting it again. If the fault is still displayed afterward, briefly interrupt the power supply. 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.

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 key adapter CKS-K-AS2A-U-C20-PC

Parameter	Value			Unit
	min.	typ.	max.	
Housing material		Plastic PA6-GF30 black		
Fixing screw tightening torque	0.25	-	0.35	Nm
Dimensions		75 x 40 x 73		mm
Weight (without connection cable)		0.13		kg
Ambient temperature at U_B = DC 30 V	-10	-	+65	°C
Degree of protection		IP65/IP67 in installed state (only access side)		
Safety class		III		
Degree of contamination		2		
Installation orientation		On the front panel		
Mounting cut-out acc. to DIN IEC 61554		33 x 68		mm
Connection		Screw terminal, 2-pin		
For the approval acc. to UL the following applies		Operation only with UL class 2 power supply or equivalent measures		
Rated insulation voltage U_i	-	-	300	V
Rated impulse withstand voltage U_{imp}	-	-	1.5	kV
Resilience to vibration		Acc. to EN IEC 60947-5-2		
Ready delay	-	0.5	-	s
Risk time	-	-	260	ms
Turn-on time	-	-	300	
AS-Interface data	EA code: 0		ID code: B	
AS-i operating voltage	19	-	31.6	DC V
Total current consumption	-	-	50	mA
Valid AS-Interface addresses		1 - 31		
AS-Interface inputs		Acc. to AS-Interface Safety at Work		
Influenced by key		D0 - D3		
Reliability values acc. to EN ISO 13849-1				
Category		4		
Performance Level		PL e		
PFH_D		4.5×10^{-9} / h		
Mission time		20		years

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11.1.1. Typical system times

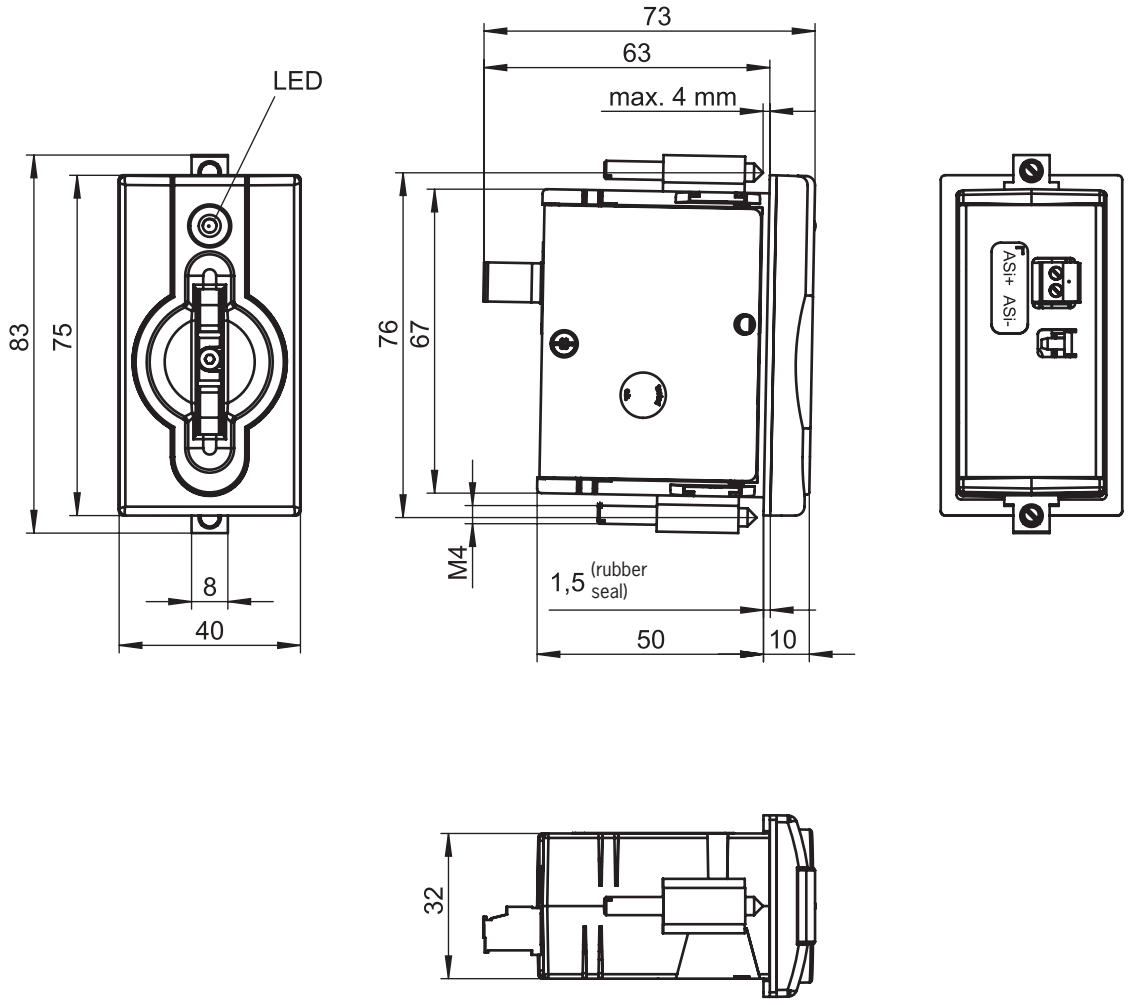
Refer to the technical data for the exact values.

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

Risk time according to EN 60947-5-3: If a key moves outside the actuating range, the zero sequence is sent via the AS-Interface bus.

Turn-on time: The max. reaction time t_{on} is the time from the moment when the key is in the actuating range to the moment when the code sequence is sent.

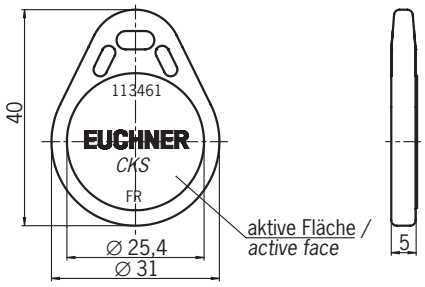
11.1.2. Dimension drawing of key adapter CKS-K-AS2A-U-C20-PC



11.2. Technical data for key CKS-A-BK1-RD-113461

Parameter	Value min.	typ.	max.	Unit
Housing material		ABS plastic		
Dimensions		40 x 31 x 5		mm
Weight		0.004		kg
Ambient temperature	- 20	-	+ 70	°C
Degree of protection		IP65/IP67		
Power supply		Inductive via key adapter		

11.2.1. Dimension drawing



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12. 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 *9.3. Functional check on page 11*)
- 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.

13. Service

If servicing is required, please contact:

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

Service telephone:

+49 711 7597-500

E-mail:

support@euchner.de

Internet:

www.euchner.com

14. Declaration of conformity

CE

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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

2077154-35-12/18

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:	Funkanlagen-Richtlinie (RED)	2014/53/EU
	Radio equipment directive	*2014/53/EU*
	Directive équipement radioélectrique	*2014/53/UE*
	Direttiva apparecchiatura radio	*2014/53/UE*
	Directiva equipo radioeléctrico	*2014/53/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*

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/EU 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
b: EN ISO 14119:2013
c: EN 62026-2:2013 (ASi)
d: EN ISO 13849-1:2015
e: EN ISO 13849-2:2012
f: EN 60947-5-2:2007/A1:2012
i: EN 50581:2012 (RoHS)
j: EN 50364:2010
k: EN 300 330 V2.1.1

03.12.2018 - NG - BJ - Blatt/*Sheet/ Page/Pagina/ Página* 1
EUCHNER GmbH + Co. KG Kohlhammerstraße 16 70771 Leinfelden-Echterdingen Tel. +49/711/7597-0 Fax +49/711/753316 www.euchner.de info@euchner.de

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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*
Auswertegerät *Safety Unit* *Analyseur* *Centralina* *Unidad de evaluación*	CES-A-ABA-01 CES-A-UBA-01 CES-A-ABA-01B CES-A-UBA-01B	I, II, III	a, b, d, e, i, j, k	ET 15038
	CES-A-AEA-02B CES-A-AEA-04B CES-A-UEA-02B CES-A-UEA-04B	I, II, III	a, b, d, e, i, j, k	ET 15050
	CES-AZ-ABS-01B CES-AZ-UBS-01B	I, II, III	a, b, d, e, i, j, k	ET 15038
	CES-AZ-AES-01B CES-AZ-AES-02B CES-AZ-AES-04B CES-AZ-UES-01B CES-AZ-UES-02B CES-AZ-UES-04B	I, II, III	a, b, d, e, i, j, k	ET 15042
Lesekopf *Read head* *Tête de lecture* *Testina di lettura* *Cabeza lectora*	CES-A-LMN-SC CES-A-LNA-SC CES-A-LNA-xxx CES-A-LCA-xxx CES-A-LQA-SC CES-A-LNN-SC CES-A-LNN-..V-...	I, II, III	a, b, d, e, i, j, k	ET 15038 ET 15050 ET 15042
	CES-A-LSP-SB CES-A-LSP-...	I, II, III	a, b, d, e, i, j, k	ET 15042
	CEM-A-LE05K-S2 CEM-A-LE05R-S2 CEM-A-LH10K-S3 CEM-A-LH10R-S3 CEM-A-LE05K-S1-10V CEM-A-LH10K-S2-10V	I, II, III	a, b, d, e, i, j, k	ET 15038 ET 15050 ET 15042
	CET.-AX-L...	I, II, III	a, b, d, e, i, j, k	ET 13050
Betätiger *Actuator* *Actionneur* *Azionatore* *Actuador*	CES-A-BBA... CES-A-BCA... CES-A-BDA... CES-A-BMB... CES-A-BQA...	I, II, III	a, b, d, e, i, j, k	ET 15038 ET 15050 ET 15042
	CES-A-BSP... CES-A-BBN...	I, II, III	a, b, d, e, i, j, k	ET 15042
	CEM-A-BE05 CEM-A-BH10	I, II, III	a, b, d, e, i, j, k	ET 15038 ET 15050 ET 15042
	CET-A-BW...	I, II, III	a, b, d, e, i, j, k	ET 13050

Benannte Stelle *Notified Body* *Organisme notifié* *Sede indicata* *Entidad citada*	0340 DGUV Test Prüf- und Zertifizierungsstelle Fachausschuss Elektrotechnik Gustav-Heinemann-Ufer 130 50968 Köln - Germany

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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* *Norma* *Estándares*	**Zertifikats-Nr.** *No. of certificate* *Numéro du certificat* *Numero del certificato* *Número del certificado*
Auswertegerät	CES-AZ-ALS...	I, II, III	a, b, d, e, i, j, k	UQS 115948
Safety Unit *Analyseur*	CES-A-F1B-01B-AS1 CES-A-V1B-01B-AS1	I, II, III	a, b, c, d, e, i, j, k	Euchner QS PB 62/2005
Centralina *Unidad de evaluación*	CEM-A-ME05K-S1 CEM-A-LE05H-S2 CEM-A-LE05K-S2-P	I, II, III	a, b, d, e, i, j, k	Euchner QS PB 22/2005 Euchner QS PB 132/2010 Euchner QS PB 019/2018
	CET1-AX-L... CET2-AX-L...	I, II, III	a, b, d, e, i, j, k	Euchner QS PB 17/2008 Euchner QS PB 23/2008 Euchner QS PB 116/2009 Euchner QS PB 115/2009
Lesekopf *Read head* *Tête de lecture* *Testina di lettura* *Cabeza lectora*	CES-A-LFP...	I, II, III	a, b, d, e, i, j, k	Euchner QS PB 110/2010
Betätiger *Actuator* *Actionneur* *Azionatore* *Actuador*	CES-A-BFP...	I, II, III	a, b, d, e, i, j, k	Euchner QS PB 110/2010
Zubehör *Accessory* *Accessoire* *Accessorio* *Accesorio*	PM-SCL-096945	III	f, i	Euchner QS PB 14 /2006

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:

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Leinfelden, Dezember 2018

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