



(1) **EU-TYPE-EXAMINATION CERTIFICATE**  
(Translation)

(2) Equipment or Protective Systems Intended for Use in  
Potentially Explosive Atmospheres - **Directive 2014/34/EU**

(3) EU-Type Examination Certificate Number:

**PTB 10 ATEX 2021 X**

**Issue: 1**

(4) Product: Electronic signal output,  
Modul-types ESK4... , ESK4-I/O, ESK4-FF , ESK4-PA

(5) Manufacturer: Krohne Messtechnik GmbH

(6) Address: Ludwig-Krohne-Straße 5, 47058 Duisburg, Germany

(7) This product and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

(8) The Physikalisch-Technische Bundesanstalt, notified body No. 0102 in accordance with Article 17 of the Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres, given in Annex II to the Directive.

The examination and test results are recorded in the confidential Test Report PTB Ex 17-27018.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

**EN 60079-0:2012 + A11:2013**

**EN 60079-11:2012**

(10) If the sign "X" is placed after the certificate number, it indicates that the product is subject to the Specific Conditions of Use specified in the schedule to this certificate.

(11) This EU-Type Examination Certificate relates only to the design and construction of the specified product in accordance to the Directive 2014/34/EU. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.

(12) The marking of the product shall include the following:

 **II 2 G Ex ia IIC T6 ... T1 Gb**

Konformitätsbewertungsstelle, Sektor Explosionsschutz  
On behalf of PTB:

Braunschweig, May 10, 2017

Dr.-Ing. F. Lienesch  
Regierungsdirektor



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EU-Type Examination Certificates without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by the Physikalisch-Technische Bundesanstalt. In case of dispute, the German text shall prevail.

(13)

## SCHEDULE

(14) **EU-Type Examination Certificate Number PTB 10 ATEX 2021 X, Issue: 1**

(15) Description of Product

The electronic signal output consists of the module-types ESK4... , ESK4-I/O, ESK4-FF, ESK4-PA and it is used for the determination of the position of magnetic sensors. The equipment is intended for the installation into display units inside the hazardous area. Electrical connection is designed for two-wire technique in type of protection Intrinsic Safety. A standardized 4...20 mA current signal with superimposed HART-communication is provided as an output signal. The modules type ESK4-FF and type ESK4-PA are intended for the connection to intrinsically bus systems (Fieldbus FF or Profi Bus PA). The module ESK4-I/O is also available with an optional display. Auxiliary power supply is provided either by the ESK4.. module or by the modules type ESK4-FF or type ESK4-PA. All electrical connections between different modules are system-internal circuits designed to Intrinsic Safety type of protection.

For relationship between module type, temperature class and permissible range of the ambient temperature, reference is made to the following table:

Module type	Temperature class		
	T6	T5	T4 ... T1
	Permissible range of the ambient temperature		
ESK4. and ESK4-I/O	-40 °C ... +60 °C	-40 °C ... +75 °C	-40 °C ... +85 °C
ESK4. and ESK4-FF or ESK4-PA	-40 °C ... +55 °C	-40 °C ... +70 °C	-40 °C ... +85 °C

Electrical data:

### Module ESK4.

Supply and signal circuit  
(terminals 11 and 12)

type of protection Intrinsic Safety Ex ia IIC or Ex ib IIC  
only for connection to a certified intrinsically safe circuit

Maximum values:

$U_i = 30 \text{ V}$   
 $I_i = 130 \text{ mA}$   
 $P_i = 1 \text{ W}$   
 $L_i = 10 \text{ } \mu\text{H}$   
 $C_i$  negligibly low

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## SCHEDULE TO EU-TYPE EXAMINATION CERTIFICATE PTB 10 ATEX 2021 X, Issue: 1

Output signal

standardized 4...20 mA current signal with  
superimposed HART-communication in 2-wire  
connection

### Module ESK4-I/O

(Output 1: terminals 1, 2, 3  
Output 2: terminals 4, 5, 6)

type of protection Intrinsic Safety Ex ia IIC or Ex ib IIC  
only for connection to certified intrinsically safe circuits

Maximum values per circuit:

$U_i = 30 \text{ V}$   
 $I_i = 130 \text{ mA}$   
 $P_i = 1 \text{ W}$   
 $L_i$  negligibly low  
 $C_i = 10 \text{ nF}$

Control input, internal counter  
(terminals 7, 8)

type of protection Intrinsic Safety Ex ia IIC or Ex ib IIC  
only for connection to a certified intrinsically safe circuit

Maximum values:

$U_i = 30 \text{ V}$   
 $I_i = 130 \text{ mA}$   
 $P_i = 1 \text{ W}$   
 $L_i$  negligibly low  
 $C_i = 10 \text{ nF}$

### Modules ESK4-FF / ESK4-PA

Bus-connection  
(terminals D, D $\perp$ )

type of protection Intrinsic Safety Ex ia IIC or Ex ib IIC  
only for connection to a certified intrinsically safe circuit

Maximum values:

$U_i = 24 \text{ V}$   
 $I_i = 380 \text{ mA}$   
 $P_i = 5.32 \text{ W}$   
 $L_i$  negligibly low  
 $C_i$  negligibly low

or

FISCO FIELD DEVICE for connection to a bus circuit  
according to the FISCO-model

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**Internal module circuits**

**Module ESK4., passive**  
(connector X2)

type of protection Intrinsic Safety Ex ia IIC  
only for connection to a certified intrinsically safe circuit

Maximum values:

$U_i = 10 \text{ V}$   
 $I_i = 1600 \text{ mA}$   
 $P_i = 1 \text{ W}$   
 $L_i$  negligibly low  
 $C_i$  negligibly low

**Module ESK4., active**  
(connector X2)

type of protection Intrinsic Safety Ex ia IIC  
internal circuit

Maximum values:

$U_o = 7.26 \text{ V}$   
 $I_o = 2317 \text{ mA}$   
 $P_o = 1 \text{ W}$   
 $L_o = 22 \text{ } \mu\text{H}$   
 $C_o = 3.3 \text{ } \mu\text{F}$

**Module ESK4-I/O, passive**  
(connector X2)

type of protection Intrinsic Safety Ex ia IIC  
only for connection to a certified intrinsically safe circuit

Maximum values:

$U_i = 7.26 \text{ V}$   
 $I_i = 2317 \text{ mA}$   
 $P_i = 1 \text{ W}$   
 $L_i = 22 \text{ } \mu\text{H}$   
 $C_i = 3.3 \text{ } \mu\text{F}$

**Module ESK4-I/O, active**  
(connector X3)

type of protection Intrinsic Safety Ex ia IIC  
internal circuit

Maximum values:

$U_o = 7.26 \text{ V}$   
 $I_o = 71 \text{ mA}$   
 $P_o = 129 \text{ mW}$   
 $L_o = 5 \text{ } \mu\text{H}$   
 $C_o = 10 \text{ } \mu\text{F}$

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**Module ESK4-I/O (display), passive**  
 (connector X1)

type of protection Intrinsic Safety Ex ia IIC  
 only for connection to a certified intrinsically safe circuit

Maximum values:

$$\begin{aligned} U_i &= 7.26 \text{ V} \\ I_i &= 71 \text{ mA} \\ P_i &= 129 \text{ mW} \\ L_i &= 5 \text{ } \mu\text{H} \\ C_i &= 10 \text{ } \mu\text{F} \end{aligned}$$

**Modules ESK4-FF / ESK4-PA, active**  
 (connector X2)

type of protection Intrinsic Safety Ex ia IIC

Maximum values:

$$\begin{aligned} U_o &= 6.6 \text{ V} \\ I_o &= 1347 \text{ mA} \\ P_o &= 0.5 \text{ W} \\ L_o &= 50 \text{ } \mu\text{H} \\ C_o &= 3 \text{ } \mu\text{F} \end{aligned}$$

### Changes with respect to previous editions

Summarization of the specifications from the initial certificate and the 1<sup>st</sup> supplement and details resulting from the following changes:

1. Modification of the arrangement and the values of components (resistors and capacitances) in the non-safety-relevant functional area of the circuitry.
2. Introduction of the new module type ESK4A that distinguishes from the module ESK4. only with respect to its software.
3. Revision of the type labels (indication of manufacturer address)
4. Revision of the presentation of the electrical data (all values apply without changes)
5. Correction of the marking
6. Revision of the operating instructions manual

(16) Test Report PTB Ex17-27018

(17) Specific conditions of use

1. The electronic signal output, module types ESK4... , ESK4-I/O, ESK4-FF , ESK4-PA shall be mounted into an enclosure which meets the degree of protection IP20 according to EN 60529 as a minimum.
2. The enclosure of the electronic signal output consists of plastic material which can charge electrostatically. A note in the operating instruction manual and a warning label on the equipment shall point to this risk.
3. For permissible range of the ambient temperature depending on the temperature class, reference is made to the operating instruction manual.

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**SCHEDULE TO EU-TYPE EXAMINATION CERTIFICATE PTB 10 ATEX 2021 X, Issue: 1**

(18) Essential health and safety requirements

Met by compliance with the aforementioned standards.

According to Article 41 of Directive 2014/34/EU, EC-type examination certificates which have been issued according to Directive 94/9/EC prior to the date of coming into force of Directive 2014/34/EU (April 20, 2016) may be considered as if they were issued already in compliance with Directive 2014/34/EU. By permission of the European Commission supplements to such EC-type examination certificates and new issues of such certificates may continue to hold the original certificate number issued before April 20, 2016.

Konformitätsbewertungsstelle, Sektor Explosionsschutz  
On behalf of PTB:

Braunschweig, May 10, 2017

Dr.-Ing. F. Lienesch  
Regierungsdirektor

