ESK Handbook

Signal converter

Additional Ex manual

LEGAL NOTICE!
This document is based on a German source document!

II2G

KROHNE

This supplementary “Ex” instruction applies to explosion protected versions of the electronic signal outputs ESKII, ESK2A and ESK3-PA. It supplements the installation and operating instructions issued for the non-hazardous-duty versions.

These instructions only contain data relevant to explosion protection. The technical specifications of the installation and operating instructions for the non-hazardous-duty version remain valid unless explicitly excluded or replaced by these Instructions.

Electronic signal outputs of the ESKII, ESK2A and ESK3-PA series have been certified in accordance with European Directive 94/9 EG (ATEX 100a) to European standards EN 60079- X for use in potentially explosive areas as stated in

PTB 00 ATEX 2063

by the Physikalisch-Technische Bundesanstalt (PTB).

This certification and its boundary conditions must be observed.

Installation, startup and maintenance may be carried out only by personnel trained in explosion protection !

2.1 Description

ESK II and the update version ESK2A are a 4...20mA loop transmitter in 2-wire technology, used as a signal output. The linear analog signal output represents the volume or massflow of a VA-meter or the level of a levelmeter.

ESK3-PA provides additional information for connecting and operating a PROFIBUS-PA field bus. The details in these instructions, especially the safety instructions, have not been modified by this supplement, and must continue to be observed.
The signal converter ESK3-PA is designed in the context of the modular concept. Installation and attachment are identical to the signal converter ESKII and ESK2A.

2.2 Safety description code

The safety description code consists of the following elements: [1]

1. **E**lectronic **S**ignal output **K**rohne
2. Designs of the signal output :
   II - Analog signal output 4-20mA with HART signal
   2A - Analog signal output 4-20mA with HART signal
   3-PA - Digital signal output for Profibus-PA in conformity with FISCO model

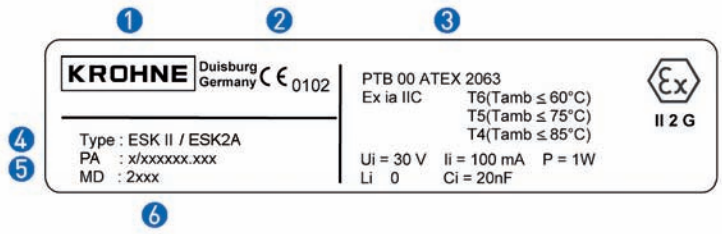
[1] positions not needed can be omitted from the description code.

2.3 Marking

Marked housing

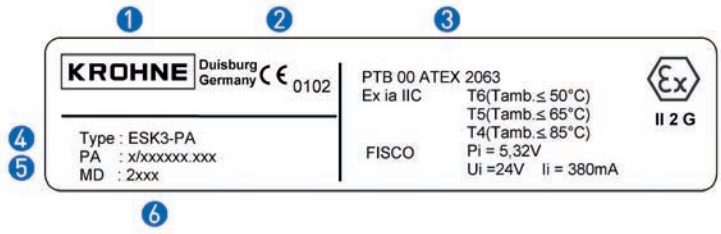
The housing is marked with the type designation of the electronic signal outputs ESK .... as shown below

ESKII / ESK2A



1. Manufacturer
2. European Conformity
3. Certification details
4. Type according to description code
5. Serial number
6. Year of manufacture

ESK3-PA



1. Manufacturer
2. European Conformity
3. Certification details
4. Type according to description code
5. Serial number
6. Year of manufacture

The description code is described in the section before. The aboriginal marking of all types according to EN50014 is registered to EEx ia IIC.

2.4 Category / Zone

The electronic signal outputs ESK .... are designed in category 2 for use in zone 1.

2.5 Ignition protected types

The power circuits of the electronic signal outputs ESK .... are designed to conform with the intrinsically safe type classified in level of protection “ia”. Operation with intrinsically safe circuits in level of protection "ib" is also allowed.

2.6 Temperature classes

Depending on temperature class and ambient temperature, the electronic signal outputs ESK .... are approved for the process temperatures contained in the following table.

Temperature class	Permitted ambient temperature T_{amb} [°C]	
	ESK II / ESK2A	ESK3-PA
T6	-40 … 60	-40 … 50
T5	-40 … 75	-40 … 65
T4...T1	-40 … 85	-40 … 85

ESK .... permitted ambient temperature T_{amb} depending on temperature class

3.1 Installation

Installation to be carried out by qualified persons in conformity with installation standards for potentially explosive areas (e.g. EN 60079-14 / VDE 0165).

The information given in the installation and operating instructions as well as in the supplementary instructions (Ex) and the EU certificate must be observed.

The suitability of the electronic signal output for the intended use should be checked by referring to the nameplate.

Special attention must be given to the following points.

4.1 Electrical connection

The electronic signal outputs must be connected to intrinsically safe circuits. The maximum safety-related values are listed below.

ESKII / ESK2A

Connection by way of a certified intrinsically safe isolation amplifier with the following maximum values:

- Ui =30 V
- Ii =100 mA
- Pi =1,0 W

For the interconnection to intrinsically safe circuits note the following values:

- Ci = 20 nF
- Li ≈ 0 µH

ESK3-PA

Connection by way of a certified segment coupler with the following maximum values:

- Pi =5,32W
- Ui =24 V
- Ii =380mA

For the interconnection, the permissible limit values for the Profibus-PA in conformity with the FISCO model must be observed.

Pinning

The electronic signal outputs are electrically connected at the terminals. The table shows the polarity at the terminals

Terminal	Polarity of terminals for electronic signal output	
Number	ESKII	ESK2A / ESK3-PA
11	+	Not polarity sensitive
12	-	

Terminal polarity of ESK ....

Connection lines

The connection lines for the intrinsically safe circuits must be selected in keeping with the applicable installation standard (e.g. EN 60079-14 / VDE 0165).

Repairs relevant to safety in relation to explosion protection may only be carried out by the manufacturer, his authorized agent, or under the supervision of qualified experts.

5.1 Maintenance

The electronic signal outputs are maintenance-free under normal operating conditions and when used as intended.

Within the scope of checks required to be carried out in hazardous areas to maintain systems in proper working order, the following visual inspections should be carried out at regular intervals:

- Inspect the housing, the terminals and the incoming lines for signs of corrosion and damage.

5.2 Dismantling

Due to the intrinsically safe supply of the electronic signal output ESK ..., replacement during operation is possible, but should preferably be carried out in off-load condition.
If this is not possible, the boundary conditions for intrinsic safety (e.g. no grounding or interconnection of different intrinsically safe circuits) must be observed during dismantling.

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