



CERTIFICATE

1 EU – Type Examination Certificate

2 Equipment or Protective System Intended for use in Potentially Explosive Atmospheres
Directive 2014/34/EU

3 EU – Type Examination Certificate Number: **KIWA 18ATEX0008 X Issue: 2**

4 Product: **Variable Area Flowmeters types DK3. /ESK/ .. / .. / .. – Ex,
DK3. / K. / .. / .. / .. – Ex, and DK3. / R1 / .. / .. / .. – Ex**

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 Kiwa Nederland B.V., Notified Body number 0620 in accordance with Article 17 of 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 confidential ATEX Assessment Report No. 170500848.

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

**EN IEC 60079-0 : 2018
EN 60079-11 : 2012**

**EN 60079-1 : 2014
EN 60079-31 : 2014**

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. 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
II 2 D Ex ia IIIC T85 °C... T140 °C Db
II 2 G Ex db IIC T6...T1 Gb
II 2 D Ex tb IIIC T85 °C...T140 °C Db

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First issue:

10 April 2019

This certificate shall, as far as applicable, be revised before the date of cessation of presumption of conformity of (one of) the included standards above as communicated in the Official Journal of the European Union.

© Integral publication of this certificate in its entirety and without any change is allowed.



13 SCHEDULE

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15.1 Description of Product

The Variable Area Flowmeters types DK3. /ESK/ .. / .. / .. – Ex, DK3. / K. / .. / .. / .. – Ex, and DK3. / R1 / .. / .. / .. – Ex, for fixed installations, are devices that are intended to measure the volume flow of flammable and non-flammable gasses and liquids. The flowmeters are equipped with a mechanical display and a 4...20 mA current output interface, with up to two MIN/MAX limit switches (NAMUR) or a reed contact.

Nomenclature

DK3. / .. / .. / .. / .. - Ex

1 / 2 / 3 / 4 / 5 / 6 – Ex

| | |
|---|---|
| 1 = Series | DK32 = Measuring unit with valve and horizontal connections DK34 = Measuring unit without valve and vertical connections |
| 2 = Optional pressure regulator | RE = Inlet pressure regulator RA = Outlet pressure regulator |
| 3 = Type of signal indicator | ESK = Current output K1 = One limit switch K2 = Two limit switches (min. and max.) R1 = Reed switch |
| 4 = Type of connection | L = Cable assembly S = Connection plug |
| 5 = Optional HT | HT = High temperature version (only in combination with reed switch (3 = R1) and cable assembly (4 = L) |
| 6 = designation not relevant for Ex | - |
| Note: Non indicated designations can be skipped | |

The type of protection is not applicable for all types in the series as indicated in the following table:

| Type | Type of protection | | | |
|-------------------------------|--------------------|------------|-----------|------------|
| | Ex ia IIC | Ex ia IIIC | Ex db IIC | Ex tb IIIC |
| DK3. /ESK/ .. / .. / .. – Ex | X | X | X | X |
| DK3. / K. / .. / .. / .. – Ex | X | X | - | - |
| DK3. / R1 / .. / .. / .. – Ex | X | - | - | - |

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15.2 Thermal data

The temperature class or surface temperature in relation to the maximum ambient temperature and the maximum process temperature is listed in the following tables:

Type DK3. /ESK/ .. / .. / .. – Ex

| | Maximum process temperature [°C] | | | | | | | | | | | | | |
|--------------------------|----------------------------------|----|----|-----|------|-----|------|------|------|-----|---------|------|------|-----|
| | T6 | | | T5 | | | T4 | | | | T3...T1 | | | |
| Ambient temperature [°C] | 40 | 50 | 55 | 50 | 65 | 70 | 40 | 60 | 65 | 70 | 40 | 60 | 65 | 70 |
| DK3./ESK/. | 85 | 85 | 85 | 100 | 100* | 90* | 135* | 105* | 100* | 90* | 140* | 105* | 100* | 90* |

* Heat-resistance cable and cable entry ≥ 90 °C

Type DK3. / K. / .. / .. / .. – Ex

| Limit switch input power | Maximum process temperature [°C] with Connection plug (S) or Cable assembly (L) | | | | | | | | | | | | | | | |
|--------------------------|---|----|----|-----|-----|-----|-----|-----|------|------|------|---------|------|------|------|------|
| | T6 | | | T5 | | | T4 | | | | | T3...T1 | | | | |
| Ambient temperature [°C] | 40 | 50 | 55 | 40 | 50 | 55 | 40 | 60 | 65 | 70 | 90 | 40 | 60 | 65 | 70 | 90 |
| SC2-NO 64 mW | 80 | 70 | 65 | 100 | 100 | 95 | 135 | 125 | 120* | 120* | 100* | 140* | 125* | 120* | 120* | 100* |
| SC2-NO 169 mW | - | - | - | 55 | - | - | 90 | 75 | 70 | - | - | 90 | 75 | 70 | - | - |
| SJ2-SN 64 mW | 80 | 70 | 70 | 100 | 100 | 95 | 135 | 125 | 120* | 120* | 100* | 140* | 125* | 120* | 120* | 100* |
| SJ2-SN 169 mW | - | - | - | 60 | 55 | - | 95 | 80 | 75* | 70* | - | 95 | 80 | 75* | 70* | - |
| I7S2002-N 64 mW | 85 | 80 | 75 | 100 | 100 | 100 | 135 | 125 | 120* | 120* | 100* | 140* | 125* | 120* | 120* | 100* |
| I7S2002-N 169 mW | 55 | - | - | 80 | 70 | 70 | 135 | 120 | 115* | 110* | 95* | 135* | 120* | 115* | 110* | 95* |

* Heat-resistance cable and cable entry ≥ 90 °C

Type DK3. / R1 / .. / .. / .. – Ex

| Reed switch | Maximum process temperature [°C] with Connection plug (S (not for HT)) or Cable assembly (L) | | | | | | | | | |
|--------------------------|--|--|------|-----|------|--|-----|---------|-----|-----|
| | T6 | | T5 | | T4 | | | T3...T1 | | |
| Ambient temperature [°C] | 55 | | 70 | 85 | 70 | | 90 | 100 | 145 | 180 |
| DK3./ R1 / . | 85 | | 100* | - | 135* | | - | 150* | - | - |
| DK3./ R1 / L / HT | 85 | | - | 100 | - | | 135 | - | 200 | 180 |

* Heat-resistance cable and cable entry ≥ 90 °C

The minimum ambient temperature is -40 °C; the minimum process temperature is -40 °C.

The maximum surface temperature T85 °C is determined for a dust layer thickness of maximum 5 mm and applies for a maximum ambient temperature of 65 °C and a maximum process temperature of 75 °C. For a process temperature > 75 °C, the maximum surface temperature is equal to the process temperature up to a maximum of 140 °C.

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15.3 Electrical data

Type DK3. /ESK/ .. / . / .. / .. – Ex

Supply and output circuit (terminals +/-):

in type of protection intrinsic safety Ex ia IIC and Ex ia IIIC, only for connection to an intrinsically safe circuit, with the following maximum values:

$U_i = 30 \text{ V}$; $I_i = 130 \text{ mA}$; $P_i = 1 \text{ W}$; $C_i = 10 \text{ nF}$; $L_i = 0 \text{ }\mu\text{H}$.

or

in types of protection Ex db or Ex tb:

$U_N = 12 \dots 32 \text{ V}$; $I_N = 4 \dots 20 \text{ mA}$.

Type DK3. / K. / . / . / . / .. / .. – Ex

Supply and output circuits (terminals Max+/- and/or Min+/-):

in type of protection intrinsic safety Ex ia IIC and Ex ia IIIC, only for connection to an intrinsically safe circuit, with the following maximum values (for each +/- circuit individually):

$U_i = 16 \text{ V}$; $I_i = 25 / 52 \text{ mA}$; $P_i = 64 / 169 \text{ mW}$;

$C_i = 150 \text{ nF}$ (fixed cable up to 10 m) or 152 nF (fixed cable from 10 m up to 20 m); $L_i = 150 \text{ }\mu\text{H}$.

Type DK3. / R1 / .. / . / .. / .. – Ex

Supply and output circuit (terminals 1,2,3 or bn,bu,rd):

in type of protection intrinsic safety Ex ia IIC and Ex ia IIIC, only for connection to an intrinsically safe circuit, with the following maximum values:

$U_i = 30 \text{ V}$; $I_i = 100 \text{ mA}$; $P_i = 1 \text{ W}$; $C_i = 0 \text{ nF}$; $L_i = 0 \text{ }\mu\text{H}$.

15.4 Instructions

The instructions provided with the product shall be followed in detail to assure safe operation.

16 ATEX Assessment Report Number

170500848.

17 Specific Conditions of Use

- 1) The Variable Area Flowmeters with coated parts shall be installed and maintained such that the risk of electrostatic discharge is minimized.
- 2) For thermal data and electrical data, refer to 15.2 and 15.3.

18 Essential Health and Safety Requirements

All relevant Essential Health and Safety Requirements are covered by the standards listed at section 9.

19 Drawings and Documents

As listed in ATEX Assessment Report No. 170500848

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20 **Description of Certificate Changes (for Issue 2 and above)**

Issue 2, Kiwa reference no. 200101027:

- Upgrade from EN 60079-0 : 2012 + A11 : 2013 to EN IEC 60079-0 : 2018.
- Correction of process temperature tables for Type DK3. / K. / .. / . / .. / .. – Ex.