Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

(1) # EC-TYPE-EXAMINATION CERTIFICATE

(Translation)

(2) Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres - **Directive 94/9/EC**

(3) EC-type-examination Certificate Number:

PTB 99 ATEX 2191

(4) Equipment: Variable-area flow meter, type DK3./....././....-EEx

(5) Manufacturer: Krohne Meßtechnik GmbH & Co. KG

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

(7) This equipment and any acceptable variation thereto are 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 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, given in Annex II to the Directive.

The examination and test results are recorded in the confidential report PTB Ex 99-29264.

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

EN 50014:1997 **EN 50020:1994**

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EC-type-examination Certificate relates only to the design, examination and tests of the specified equipment in accordance to the Directive 94/9/EC. Further requirements of the Directive apply to the manufacturing process and supply of this equipment. These are not covered by this certificate.

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

II 2 G EEx ia IIC T6

Zertifizierungsstelle Explosionsschutz
By order:

(signature)

Dr.-Ing. U. Johannsmeyer
Regierungsdirektor

Braunschweig, November 16, 1999

3 pages, correct and complete as regards content.
By order:

Dr.-Ing. Johannsmeyer
Direktor und Professor

Braunschweig, March, 18, 2009

(13) # S C H E D U L E

(14) ## EC-TYPE-EXAMINATION CERTIFICATE PTB 99 ATEX 2191

(15) Description of equipment

The Variable-area flow meters of type series DK3./...././....-EEx are used for the measurement of the volumetric flow of flammable and non-flammable gases and liquids.

For relationship between temperature class, ambient temperature and medium temperature, reference is made to the following table:

Temperature class	maximum permissible ambient temperature [°C]	maximum permissible medium temperature [°C] with plug connector (S) or cable gland (L) type DK 32	type DK 34
T6	40°C	55°C	55°C
T5	40°C 50°C 60°C	80°C 70°C 65°C	85°C 75°C 65°C
T4	40°C 50°C 60°C	130°C 120°C 115°C	135°C 130°C 125°C
T3 ... T1	40°C 50°C 60°C	130°C 120°C 115°C	140°C 130°C 125°C

Electrical data

Limit sensor circuits
(plug connector or open-ended cable)

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

Maximum values for each circuit:

U_i = 16 V
I_i = 52 mA
P_i = 169 mW

$C_i \leq$ 150 nF
$L_i \leq$ 150 µH

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

SCHEDULE TO EC-TYPE-EXAMINATION CERTIFICATE PTB 99 ATEX 2191

(16) Test report PTB Ex 99-29264

(17) Special conditions for safe use

none

(18) Essential health and safety requirements

met by compliance with the standards mentioned above

Zertifizierungsstelle Explosionsschutz
By order:

(signature)

Dr.-Ing. U. Johannsmeyer
Regierungsdirektor

Braunschweig, November 16, 1999

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

1. SUPPLEMENT

according to Directive 94/9/EC Annex III.6

to EC-TYPE-EXAMINATION CERTIFICATE PTB 99 ATEX 2191

(Translation)

Equipment: Variable-area flow meter, type DK3./....././/....-EEx

Marking: Ex **II 2 G EEx ia IIC T6**

Manufacturer: KROHNE Meßtechnik GmbH & Co. KG

Address: Ludwig-Krohne-Straße 5
47058 Duisburg, Germany

Description of supplements and modifications

In the future the variable-area flow meter, type DK3./....././/....-EEx may also be manufactured and operated according to test documents listed in the test report. The modifications concern the type label, the application of a mechanical differential pressure controller for the variant DK32/....././/....-EEx as well as the introduction of the variant DK3./....././/..../A-EEx provided with a separately certified limit sensor. The temperature specifications and the "Electrical data" for this variant change as follows:

Variable-area flow meter, type DK3./....././/..../A-EEx

For relationship between temperature class, ambient temperature and medium temperature, reference is made to the following table:

Temperature-class	maximum permissible ambient temperature [°C]	maximum permissible medium temperature [°C] with plug connector (S) or cable gland (L)	
		type DK 32	type DK 34
T6	40 50 60	75 70 60	80 70 60
T5	40 50 60	100 95 85	100 100 90
T4	40 50 60	135 130 120	135 135 130

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

1. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 99 ATEX 2191

Electrical data

Limit sensor circuits
(plug connector or open-ended cable)

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

Maximum values for each circuit:

U_i = 16 V
I_i = 25 mA
P_i = 64 mW

C_i ≤ 150 nF
L_i ≤ 150 µH

All other specifications apply without changes.

Test report: PTB Ex 01-21218

Zertifizierungsstelle Explosionsschutz
By order:

Braunschweig, October 29, 2001

(signature)

Dr.-Ing. U. Johannsmeyer
Regierungsdirektor

2 pages, correct and complete as regards content.
By order:

Dr.-Ing. Johannsmeyer
Direktor und Professor

Braunschweig, March, 18, 2009

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

2. S U P P L E M E N T

according to Directive 94/9/EC Annex III.6

to EC-TYPE-EXAMINATION CERTIFICATE PTB 99 ATEX 2191

(Translation)

Equipment: Variable-area flow meter, type DK3./../../../../.-Ex

Marking: ⟨Ex⟩ **II 2 G EEx ia IIC T6**

Manufacturer: KROHNE Messtechnik GmbH & Co. KG

Address: Ludwig-Krohne-Straße 5, 47058 Duisburg, Germany

Description of supplements and modifications

In the future the variable-area flow meter, type DK3./../../../../.-Ex may also be manufactured and operated according to test documents listed in the test report. The modifications comprise the introduction of alternative, separately certified limit sensors, the introduction of flange connection adaptors intended for the installation of the measuring units into vertically mounted pipings, measures against electrostatic charge, the extension of the permissible medium and ambient temperatures, the revision of the type code and the introduction of an alternative lacquer as well as the adaption to the current state of the standard series EN 60079-et sqq. and, therefore, the marking of the equipment.

This will read in future:

Marking: ⟨Ex⟩ **II 2 G Ex ia IIC T6**

The electrical data change with respect to the marking of the limit sensor circuits (the values apply without changes).

Electrical data

Limit sensor circuits
(plug connector or open-ended cable)

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

Maximum values for each circuit:

U_i = 16 V
I_i = 25 mA
P_i = 64 mW

C_i ≤ 150 nF
L_i ≤ 150 µH

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Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

2. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 99 ATEX 2191

For relationship between temperature class, ambient temperature and medium temperature, reference is made to the following table:

Temperature-class	maximum permissible ambient temperature [°C]	maximum permissible medium temperature [°C] with plug connector (S) or cable gland (L) type DK 32	type DK 34
T6	-20 ... +40 -20 ... +50 -20 ... +60	75 70 60	80 70 60
T5	-20 ... +40 -20 ... +50 -20 ... +60	100 95 85	100 100 90
T4	-20 ... +40 -20 ... +50 -20 ... +60 -20 ... +90	135 130 120 90	135 135 130 90
T3 ... T1	-20 ... +40 -20 ... +50 -20 ... +60 -20 ... +90	135 130 120 90	150 140 130 90

All other specifications of the EC-type examination certificate including the 1st supplement apply without changes also to this 2nd supplement.

Applied standards

EN 60079-0:2006 EN 60079-11:2007

Assessment and test report: PTB Ex 09-29015

Zertifizierungssektor Explosionsschutz
By order:

Dr.-Ing. U. Johannsmeyer
Direktor und Professor

Braunschweig, March 17, 2009

Physikalisch-Technische Bundesanstalt
Braunschweig und Berlin
Nationales Metrologieinstitut

3. SUPPLEMENT

according to Directive 94/9/EC Annex III.6

to EC-TYPE-EXAMINATION CERTIFICATE PTB 99 ATEX 2191

(Translation)

Equipment: Variable-area flow meter, type DK3./../../../../.-Ex

Marking: **II 2 G Ex ia IIC T6**

Manufacturer: KROHNE Messtechnik GmbH
formerly
KROHNE Messtechnik GmbH & Co. KG

Address: Ludwig-Krohne-Straße 5, 47058 Duisburg, Germany

Description of supplements and modifications

In the future the variable-area flow meter, type DK3./../../../../.-Ex may also be manufactured and operated according to test documents listed in the test report. The modifications concern the adaption to the current state of the standards, the marking of the equipment as well as the name of the manufacturer (change of corporate form) as given above. Technical modifications have not been made.

The marking will read in future:

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

All other specifications of the EC-type examination certificate including the 1st and 2nd supplement apply without changes also to this 3rd supplement.

Applied standards

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

Test report: PTB Ex 15-25192

Konformitätsbewertungsstelle, Sektor Explosionsschutz
On behalf of PTB:

Braunschweig, October 29, 2015

Dr.-Ing. U. Johannsmeyer
Direktor und Professor

Sheet 1/1

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