KROHNE

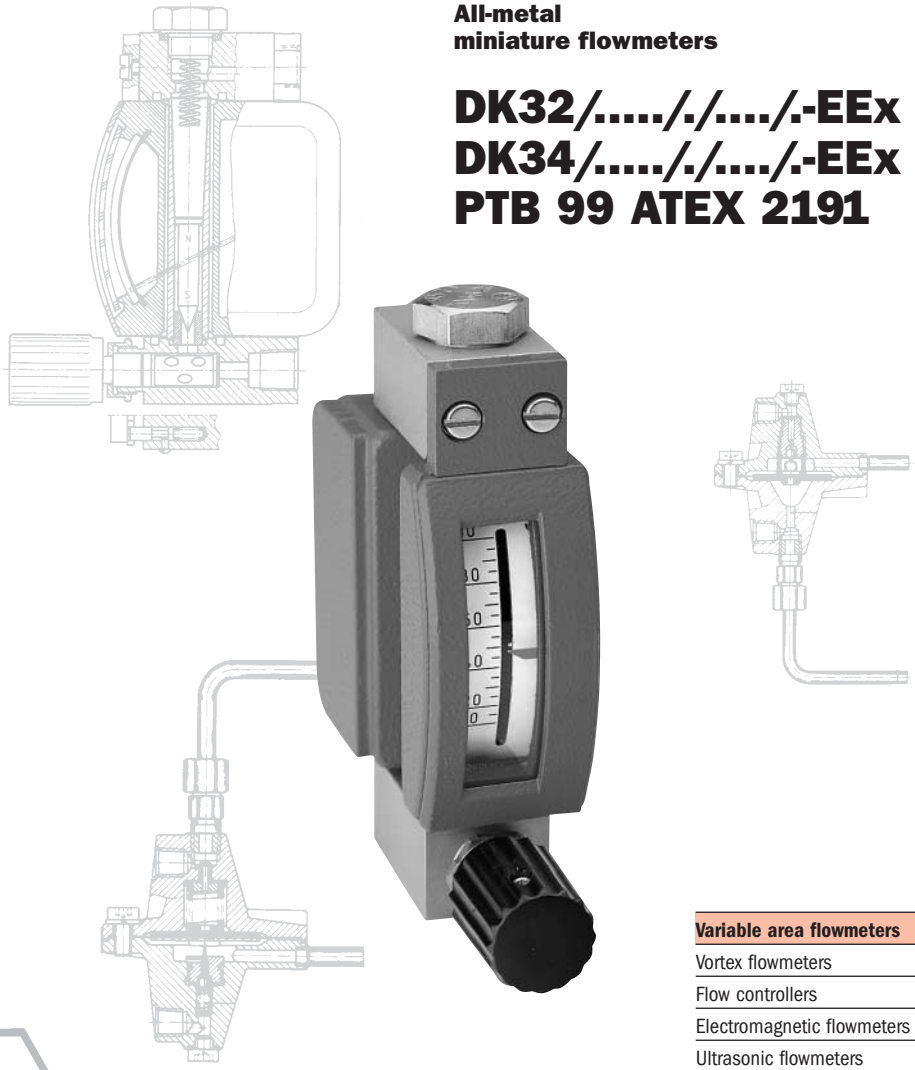
 7.10018.21.00

GR

Supplementary Installation and Operating Instructions

All-metal miniature flowmeters

DK32/....././..../.-EEx
DK34/....././..../.-EEx
PTB 99 ATEX 2191



Variable area flowmeters

Vortex flowmeters

Flow controllers

Electromagnetic flowmeters

Ultrasonic flowmeters

Mass flowmeters

Level measuring instruments

Communications engineering

Engineering systems & solutions

Switches, counters, displays and recorders

Heat metering

Pressure and temperature

Contents

1 General safety information

These additional “Ex“ Instructions apply to the hazardous-duty versions of DK32/....././..../.-EEx and DK34/....././..../.-EEx variable-area flowmeters. They are supplementary to the Installation and Operating Instructions issued for the non-hazardous-duty versions.

The information given in these Instructions contains only the data relevant to explosion protection. The technical details given in the Installation and Operating Instructions for the non-hazardous-duty versions apply unchanged unless excluded or superseded by these Instructions.

In compliance with European Directive 94/9 EG (ATEX 100a) and in conformity with European Standards EN 50XXX, variable-area flowmeters of the DK32/....././..../.-EEx and DK34/....././..../.-EEx Series are approved for use in hazardous areas under

PTB 99 ATEX 2191

by the Physikalisch-Technische Bundesanstalt (PTB).

This approval, together with its boundary conditions, is required to be observed without fail (see Attachment A.1 “EC Type Approval Certificate“).

Important: please observe the following:

- the notices and requirements and the electrical data specified in the **EC Type Approval Certificate,**
- in addition to the regulations for heavy-current installations (VDE 0100), in particular the regulations in **EN 60079-14 “Electrical installations in hazardous areas”**.
- Mounting, installation, start-up and maintenance work may only be carried out by personnel who have received **“training in explosion protection”.**

2 Safety-relevant type code

The safety-relevant type code is made up of the following elements: [(1)]

DK	3. ...	.....	/	.	/	....	/.	-	E	Ex
1	2	3	4	5	6	7	8

1 : Variable-area flowmeter **DK**

2 : Model series of measuring section

- 3**2** Measuring section with needle valve and horizontal connection
- 3**2 ...** as above, with controller (RAR; RER; RAN; REN; NRE; NRA)
- 3**4** Measuring section without needle valve, with vertical connection

3 : Limit switches

- **..** Version without limit switches
- **K1min** Version with min. limit switch
- **K1max** Version with max. limit switch
- **K2** Version with two limit switches

4 : Connection variant

- **L** Version with cable entry and connecting cable
- **S** Version with plug connector

5 : Marking – no effect on explosion protection

6 : Variant, limit switch ATEX

- **A** limit switch EC type-tested

7 : **E** Approved to European Standard

8 : **Ex** Hazardous-duty equipment

[1] places for items not needed may be omitted from the type code

3 Main safety-relevant characteristics

3.1 Category / Zone

The indicator sections and the measuring tubes of the variable-area flowmeters are basically designed in Category 2 for use in Zone 1.

3.2 Types of protection

The electric circuits of the limit switches are designed in Intrinsic Safety type of protection of Category “ia“ or “ib“.

3.3 Temperature classes

The variable-area flowmeters DK3./....././..../.-EEx are approved, subject to device version, temperature class and ambient temperature, for the process temperatures listed in Tables 1 and 2 below.

Temperature classification is dependent upon the type of measuring section and on the connection variant of the indicator part. It applies independent of the selected flow measuring range.
No distinction is made between indicators with one or with two contacts.

Temperature class	T_{amb} up to [°C]	T_m up to [°C] for version with plug (S) or with cable entry (L)	
		Type DK32	Type DK34
T6	40	55	55
T5	40	80	85
	50	70	75
	60	65	65
T4	40	130	135
	50	120	130
	60	115	125
T3 ... T1	40	130	140
	50	120	130
	60	115	125

Table 1 DK3./....././....- EEx, permissible process and ambient temperatures

Temperature class	T_{amb} up to [°C]	T_m up to [°C] for version with plug (S) or with cable entry (L)	
		Type DK32	Type DK34
T6	40	75	80
	50	70	70
	60	60	60
T5	40	100	100
	50	95	100
	60	85	90
T4	40	135	135
	50	130	135
	60	120	130
T3 ... T1	40	135	150
	50	130	140
	60	120	130

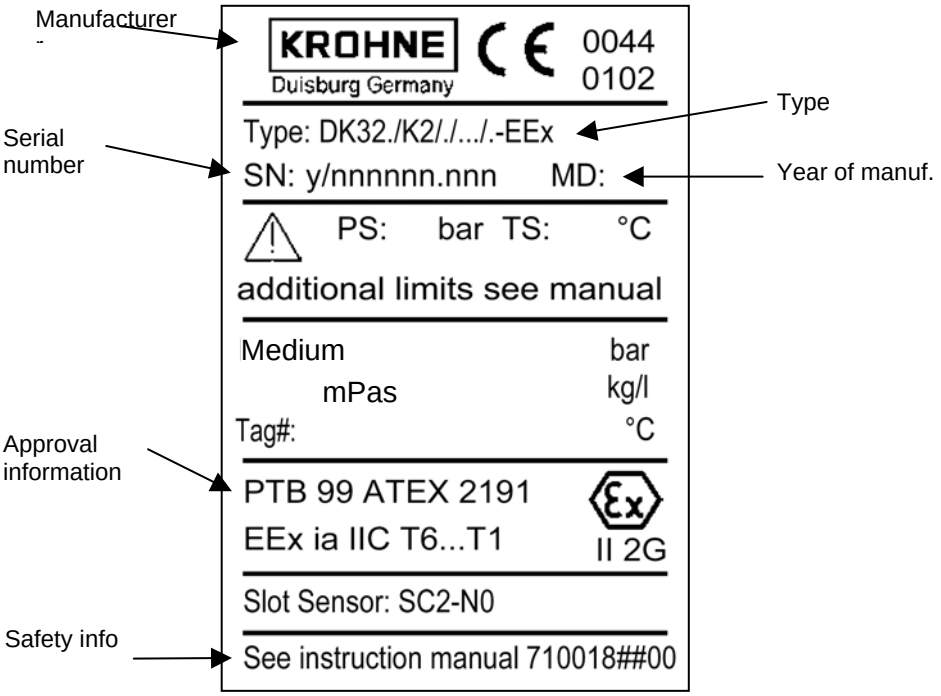
Table 2 DK3./....././....**/A**- EEx, permissible process and ambient temperatures

4 Marking

4.1 Marking of indicator part

The device type designation is clearly visible on the nameplate, shown below.
The type code is described in Section 2.

An additional marking with the serial number is affixed inside the indicator.

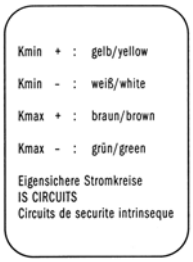


4.2 Wiring labels

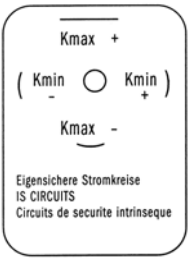
Depending on the version, the indicator is identified by the following labels.

Note:
The labels refer in all cases to indicators with two limit switches. For indicators with one contact, use the safety-relevant type code (see Section 2) and the type designation on the nameplate to establish the contact fitted.

Indicator with cable entry (L)



Indicator with plug connector (S)



5 Mounting and installation

Mounting and installation work to be carried out in conformity with the valid wiring standards for hazardous areas (e.g. EN 60079-14 / VDE 0165) by specialist personnel trained in explosion protection. The information given in the standard Installation and Operating Instructions, the Supplementary Installation and Operating Instructions (“Ex“) and the EC Type Approval Certificate (see Attachment A.1) shall be observed without fail. Verify suitability of the variable-area flowmeter for the application range in question by checking the information given on the nameplate. Check compatibility of the process product with the wetted parts against the data specified in the order.
Special attention should be paid to the following points when installing.

5.1 Electrical connection

The limit switches may only be connected to separated intrinsically safe circuits. The following maximum values per circuit apply depending on the device version:

- Version DK3./....././....-EEx
  U_i = 16 V
  I_i = 52 mA
  P_i = 169 mW
- Version DK3./....././..../**A**-EEx
  U_i = 16 V
  I_i = 25 mA
  P_i = 64 mW

Independent of the device version, when interconnecting allow for the following values for each intrinsically safe circuit:

- C_i = 150 nF
- L_i = 150 µH

5.1.1 Terminal assignment

Electrical connection of the limit switches for:

- version with plug connector (S)
  is carried out in the terminal compartment of the plug connector housing,
- version with prefabricated connecting cable (L)
  is carried out direct at the flying lead

as shown in the wiring labels (see Section 4.2).

Note:
The wiring labels in all cases describe indicator parts with two contacts. Where indicator parts have only one contact, refer to the safety-relevant type code (see Section 2) and the type designation on the nameplate to establish the contact fitted.

5.1.2 Connecting cable

Select the connecting cables for the intrinsically safe circuits in accordance with the valid wiring standard (e.g. EN 60079-14 / VDE 0165).

6 Start-up

Check the following points before (initial) start-up:

- Suitability of the materials used for the measuring cone and for the gaskets for adequate resistance to corrosion from the process fluid.
- Correct connection of the limit switches.

7 Operation

Limit switches may be adjusted during operation. For this purpose, remove the housing cover and close it again immediately after setting the limit switches.

8 Preventive maintenance

8.1 Indicator

The indicator section does not require any maintenance under normal operating conditions and when used for the intended purpose. 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:

- inspection of the housing, cable entries and incoming cables for signs of corrosion and damage.
- check of the measuring section and the needle valve, if applicable, for leakages.

8.2 Measuring section

The measuring section is maintenance-free under normal operating conditions and when used for the intended purpose. Depending on application, however, the measuring function may in unfavourable cases become impaired through soiling of the measuring cone or the float. The measuring section should be cleaned as described in the Installation and Operating Instructions for the non-hazardous-duty versions. The measuring section must be dismantled before it can be cleaned.
In this connection, refer to the notes on replacement of the complete flowmeter (see Section 9.2).

9 Dismantling

9.1 Replacement of indicator section

Indicator replacement is possible thanks to the modular structure of the variable-area flowmeters. The measuring tube need not be removed and can remain in the pipeline. This also applies to pressurized pipes.

Replacement and removal should if possible be carried out when the device is disconnected from supply. If that proves impossible, be sure to observe the boundary conditions for Intrinsic Safety (e.g. no grounding or interconnection of different intrinsically safe circuits) during dismantling.

9.2 Replacement of complete flowmeter

The same requirements apply as described in Section 9.1.

Note:
Pressurized pipes to be depressurized before removing the measuring section.
Avoid uncontrolled discharge of residual liquid from the measuring section.
In the case of environmentally critical substances, carefully decontaminate the wetted parts of the measuring tube after dismantling.
Removal and installation are the responsibility of the operator.

10 Maintenance

Maintenance work of a safety-relevant nature within the meaning of explosion protection may only be carried out by the manufacturer, his authorized representative or under the supervision of authorized inspectors.

11 Attachment A.1 EC Type Approval Certificate PTB 99 ATEX 2191

German Original

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

PTB

EG-Baumusterprüfbescheinigung

(1)

(2) Geräte und Schutzsysteme zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen - **Richtlinie 94/9/EG**

(3) EG-Baumusterprüfbescheinigungsnummer

PTB 99 ATEX 2191

(4) Gerät: Schwebekörper Durchflussmesser Typ DK3./...../../....-EEx

(5) Hersteller: Krohne Meßtechnik GmbH & Co KG

(6) Anschrift: D-47058 Duisburg, Ludwig Krohne Straße 5

(7) Die Bauart dieses Gerätes sowie die verschiedenen zulässigen Ausführungen sind in der Anlage zu dieser Baumusterprüfbescheinigung festgelegt.

(8) Die Physikalisch-Technische Bundesanstalt bescheinigt als benannte Stelle Nr. 0102 nach Artikel 9 der Richtlinie des Rates der Europäischen Gemeinschaften vom 23. März 1994 (94/9/EG) die Erfüllung der grundlegenden Sicherheits- und Gesundheitsanforderungen für die Konzeption und den Bau von Geräten und Schutzsystemen zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen gemäß Anhang II der Richtlinie.

Die Ergebnisse der Prüfung sind in dem vertraulichen Prüfbericht PTB Ex 99-29264 festgelegt.

(9) Die grundlegenden Sicherheits- und Gesundheitsanforderungen werden erfüllt durch Übereinstimmung mit

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

(10) Falls das Zeichen "X" hinter der Bescheinigungsnummer steht, wird auf besondere Bedingungen für die sichere Anwendung des Gerätes in der Anlage zu dieser Bescheinigung hingewiesen.

(11) Diese EG-Baumusterprüfbescheinigung bezieht sich nur auf Konzeption und Bau des festgelegten Gerätes gemäß Richtlinie 94/9/EG. Weitere Anforderungen dieser Richtlinie gelten für die Herstellung und das Inverkehrbringen dieses Gerätes.

(12) Die Kennzeichnung des Gerätes muß die folgenden Angaben enthalten:

II 2 G EEx ia IIC T6

Zertifizierungsstelle Explosionsschutz
Im Auftrag

Dr.-Ing. U. Johannsmeyer
Regierungsdirektor

Braunschweig, 16. November 1999

PHYSIKALISCH-TECHNISCHE BUNDESANSTALT

Seite 1/3

English Translation

Physikalisch-Technische Bundesanstalt **PTB**
Brunswick and Berlin

(1) **EC Type Approval Certificate**

(2) Devices and protective systems for use as prescribed
In hazardous areas – **Directive 94/9/EC**

(3) EC Type Approval Certificate Number

PTB 99 ATEX 2191

(4) Device: Variable-area flowmeters Type DK3./…././….-EEx

(5) Manufacturer: KROHNE Messtechnik GmbH & Co. KG

(6) Address: D-47058 Duisburg, Ludwig Krohne Strasse 5

(7) The design of this device as well as the variously approved versions are defined in the Schedule to this Type Approval Certificate and in the documents listed in the Schedule.

(8) The Physikalisch-Technische Bundesanstalt, being the notified body No. 0102 in accordance with Article 9 of the Council Directive of European Communities dated 23rd March 1994 (94/9/EC), certifies that the basic health and safety requirements have been satisfied for the conception and construction of devices and protective systems for use as prescribed in hazardous areas in accordance with Appendix II of said Directive.

The results of the test are specified in the confidential test report PTB Ex 99-29264.

(9) The basic health and safety requirements are satisfied by conformity with

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

(10) If the character "X" is appended to the certificate number, this refers to special conditions for the safe application of the device as given in the Schedule to this Certificate.

(11) This EC Type Test Certificate applies only to the conception and construction of the defined device in accordance with Directive 94/9/EC. Further requirements of said Directive apply to the manufacture of that device and to putting it on the market. Such requirements are not covered by this Certificate.

(12) The marking of the device must include the following details:

 **II 2 G** **EEx ia IIC T6**

Certification Agency for Explosion Protection Brunswick, 16th November 1999
on behalf of Official stamp
(signed) of the PTB
Dr.-Ing. U. Johannsmeyer
Regierungsdirektor

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German Original

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

(13) **A n l a g e**

(14) **EG-Baumusterprüfbescheinigung PTB 99 ATEX 2191**

(15) Beschreibung des Gerätes

Die Schwebekörper Durchflussmesser Typ DK3./....././....-EEx dienen zur Messung des Volumendurchflusses von brennbaren und nicht brennbaren Gasen und Flüssigkeiten.

Der Zusammenhang zwischen Temperaturklasse, Umgebungs- und Mediumtemperatur ist der folgenden Tabelle zu entnehmen:

Temperatur-klasse	Höchstzul. Umgebungs-temperatur	Höchstzul. Mediumtemperatur mit Stecker bzw. Leitungseinführung Typ DK 32	Typ 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

Elektrische Daten

Grenzwertgeberstromkreise (Stecker bzw. Kabelschwanz)

in Zündschutzart Eigensicherheit EEx ia IIC/IIB
bzw. EEx ib IIC/IIB
nur zum Anschluß an bescheinigte eigensichere Stromkreise
Höchstwerte je Stromkreis:

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

$C_i \leq 150$ nF
$L_i \leq 150$ µH

Seite 2/3

English Translation

Physikalisch-Technische Bundesanstalt **PTB**
Brunswick and Berlin

(13) **S c h e d u l e**

(14) **EC Type Approval Certificate PTB 99 ATEX 2191**

(15) Device description

The Type DK3./….././….-EEx variable-area flowmeters are designed to measure the volume rate of flow of flammable and non-flammable gases and liquids.

The correspondence between temperature class, ambient temperature and process temperature is shown in the following table.

Temperature class	Max. permissible ambient temperature	Max. permissible process temperature with plug connector Type DK 32	or cable entry 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 switch circuits
(plug connector or flying lead)

Intrinsic Safety type of protection EEx ia IIC/IIB
or EEx ib IIC/IIB
only for connection to a certified intrinsically safe circuit.
Peak values per circuit:
U_i = 16 V
I_i = 52 mA
P_i = 169 mW

C_i ≤ 150 nF
L_i ≤ 150 µH

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

Anlage zur EG-Baumusterprüfbescheinigung PTB 99 ATEX 2191

(16) Prüfbericht PTB Ex 99-29264

(17) Besondere Bedingungen

keine

(18) Grundlegende Sicherheits- und Gesundheitsanforderungen

durch vorstehende Normen abgedeckt

Zertifizierungsstelle Explosionsschutz
Im Auftrag

Dr.-Ing. U. Johannsmeyer
Regierungsdirektor

Braunschweig, 16. November 1999

PHYSIKALISCH-TECHNISCHE BUNDESANSTALT 24

Seite 3/3

Physikalisch-Technische Bundesanstalt • Bundesallee 100 • D-38116 Braunschweig

English Translation

Physikalisch-Technische Bundesanstalt **PTB**
Brunswick and Berlin

Schedule to EC Type Approval Certificate PTB 99 ATEX 2191

(16) Test report PTB Ex 99-29264

(17) Special conditions
none.

(18) Basic health and safety requirements
are satisfied by conformity with the afore-mentioned standards.

Certification Agency for Explosion Protection
On behalf of
(signed)

Official stamp
of the PTB

Brunswick, 16th November 1999

Dr.-Ing. U. Johannsmeyer
Regierungsdirektor

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

1. ERGÄNZUNG

gemäß Richtlinie 94/9/EG Anhang III Ziffer 6

zur EG-Baumusterprüfbescheinigung PTB 99 ATEX 2191

Gerät: Schwebekörper Durchflussmesser Typ DK3./....././....-EEx

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

Hersteller: Krohne Meßtechnik GmbH & Co.KG

Anschrift: Ludwig Krohne Straße 5
47058 Duisburg, Deutschland

Beschreibung der Ergänzungen und Änderungen

Der Schwebekörper Durchflussmesser Typ DK3./....././....-EEx darf künftig auch nach den im Prüfbericht aufgeführten Prüfungsunterlagen gefertigt und betrieben werden. Die Änderungen betreffen das Typenschild, die Verwendung eines mechanischen Differenzdruckreglers für die Variante DK32/....././....-EEx, sowie die Einführung der Gerätevariante DK3./....././..../A-EEx mit separat bescheinigtem Grenzwertkontakt. Für diese Variante ändern sich die Temperaturangaben und "Elektrischen Daten" wie folgt:

Schwebekörper Durchflussmesser Typ DK3./....././..../A-EEx

Der Zusammenhang zwischen Temperaturklasse, Umgebungs- und Mediumtemperatur ist der folgenden Tabelle zu entnehmen:

Temperatur-klasse	Höchstzul. Umgebungs-temperatur in °C	Höchstzul. Mediumtemperatur in °C mit Stecker (S) bzw. Leitungseinführung (L)	
		Typ DK 32	Typ DK 34
T6	40	75	80
	50	70	70
	60	60	60
T5	40	100	100
	50	95	100
	60	85	90
T4	40	135	135
	50	130	135
	60	120	130
T3 ... T1	40	135	150
	50	130	140
	60	120	130

Seite 1/2

English Translation

Physikalisch-Technische Bundesanstalt **PTB**
Brunswick and Berlin

SUPPLEMENT No. 1
in accordance with Directive 94/9/EC Annex III Sub-item 6

to EC Type Approval Certificate PTB 99 ATEX 2191

Device:	Flowmeter Type DK3./….././….-EEx
Marking:	⟨Ex⟩ II 2 G EEx ia IIC T6
Manufacturer:	KROHNE Messtechnik GmbH & Co. KG
Address:	D-47058 Duisburg, Ludwig Krohne Strasse 5, Germany

Description of additions and modifications

The variable-area flowmeter Type DK3./….././….-EEx may in future also be manufactured and operated in accordance with the approval documents listed in the test report. The modifications relate to the nameplate, the use of a mechanical differential-pressure controller for the variant DK32/….././….-EEx, as well as the introduction of the device variant DK3./….././…./A-EEx with separately certified limit contact. For this variant the temperature data and “electrical data” have been changed as follows.

Variable-area flowmeter Type DK3./….././…./A-EEx

The correspondence between temperature class, ambient temperature and process temperature is shown in the following table:

Temperature class	Max. permissible ambient temperature in °C	Max. permissible process temperature in °C with plug (S) Type DK 32	or cable entry (L) Type DK 34
T6	40	75	80
	50	70	70
	60	60	60
T5	40	100	100
	50	95	100
	60	85	90
T4	40	135	135
	50	130	135
	60	120	130
T3 … T1	40	135	150
	50	130	140
	60	120	130

German Original

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

1. Ergänzung zur EG-Baumusterprüfbescheinigung PTB 99 ATEX 2191

Elektrische Daten

Grenzwertgeberstromkreise (Stecker bzw. Kabelschwanz)	in Zündschutzart Eigensicherheit EEx ia IIC/IIB bzw. EEx ib IIC/IIB nur zum Anschluß an bescheinigte eigensichere Stromkreise

Höchstwerte je Stromkreis:

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

$C_i \leq 150$ nF
$L_i \leq 150$ µH

Alle übrigen Angaben bleiben unverändert.

Prüfbericht: PTB Ex 01-21218

Zertifizierungsstelle Explosionsschutz
Im Auftrag

Dr.-Ing. U. Johannsmeyer
Regierungsdirektor

Braunschweig, 29. Oktober 2001

English Translation

Physikalisch-Technische Bundesanstalt **PTB**
Brunswick and Berlin

Supplement No. 1 to EC Type Approval Certificate PTB 99 ATEX 2191

Electrical data

Limit switch circuits (plug connector or flying lead)	Intrinsic Safety type of protection EEx ia IIC/IIB or EEx ib IIC/IIB only for connection to certified intrinsically safe circuits

Peak values per circuit:

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

C_i ≤ 150 nF
L_i ≤ 150 µH

All other data remain unchanged.

Test report: PTB Ex 01-21218

Certification Agency for Explosion Protection
on behalf of
(signed)

Official stamp
of the PTB

Brunswick, 29th October 2001

Dr.-Ing. U. Johannsmeyer
Regierungsdirektor

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12 Attachment A.2 Declaration of Conformity

DECLARATION OF CONFORMITY

Konformitätsbescheinigung | Déclaration de Conformité

KROHNE

The Level and Flow Company

KROHNE Messtechnik GmbH & Co. KG
Ludwig-Krohne-Str. 5

D-47058 Duisburg
Germany

We declare herewith under sole responsibility that the product(s):
Wir erklären in alleiniger Verantwortung, dass das Produkt / die Produkte:
Nous déclarons sous notre seule responsabilité que le(s) produit(s) :

DK3./....././.....-EEx

Variable Area Flow Meter /Schwebekörper Durchflussmesser / Débitmètre à Section Variable

complies with the directive on devices and protective systems designated for use in areas subject to explosion hazards:
der Richtlinie über Geräte und Schutzsysteme zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen entspricht:
est en accord avec la directive sur les instruments et systems protectifs conçus pour l'utilisation dans des endroit à risques d'explosion :

Directive 94/9/EG.

The stipulated safety and public health safety requirements are fulfilled in accordance with:
Die grundlegenden Sicherheits- und Gesundheitsanforderungen werden erfüllt durch Übereinstimmung mit:
Les obligations à l'encontre de la securité et de la santé publique sont remplis en accord avec :

EN 50014: 1997; EN 50020: 1994

The equipment type plates must bear the following:
Die Kennzeichnung des Gerätes muß folgende Angaben enthalten:
Il doit être mentionné sur l'inscription de type de l'equipment :

II 2 G EEx ia IIC T6

PTB 99 ATEX 2191

Duisburg, Sept. 25th, 2002

General Management / Geschäftsführung / Chef d´ entreprise

If you need to return a device for testing or repair to KROHNE

Your instrument has been carefully manufactured and tested. If installed and operated in accordance with these operating instructions, your instrument will rarely present any problems. Should you nevertheless need to return an instrument for checkout or repair, please pay strict attention to the following points:

Due to statutory regulations concerning protection of the environment and safeguarding the health and safety of our personnel, KROHNE may only handle, test and repair returned instruments that have been in contact with liquids if it is possible to do so without risk to personnel and environment.

This means that KROHNE can only service your instrument if it is accompanied by a certificate in line with the following model confirming that the instrument is safe to handle.

If the instrument has been operated with toxic, caustic, flammable or water-endangering liquids, you are kindly requested

- to check and ensure, if necessary by rinsing or neutralising, that all cavities in the instrument are free from such dangerous substances.
  (Directions on how you can find out whether the primary head has to be opened and flushed out or neutralised are obtainable from KROHNE on request.)

- to enclose a certificate with the instrument confirming that the instrument is safe to handle and stating the liquid used.

KROHNE regret that they cannot service your instrument unless it is accompanied by such a certificate.

Specimen certificate

Company: …….. Address: ……

Department: …….. Name: ……

Tel. No.: …… Fax No.: ……

The enclosed instrument

Type: ……

KROHNE Order No. or Series No.: ……

has been operated with the following process liquid: ……..

Because this process liquid is
water-endangering * / toxic * / caustic * / flammable *
we have
– checked that all cavities in the instrument are free from such substances *
– flushed out and neutralised all cavities in the instrument *
(* delete where not applicable)
We confirm that there is **no** risk to man or environment through any residual liquid contained in the instrument.

Date: …….. Signature: ……..

Company stamp: