



Supplementary Installation and
Operating Instructions

**Flap-type Flow Meter
KFS-EM Ex**



**Category
II 2G**



Kirchner und Tochter



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1. General safety directions

These Supplementary Installation and Operating Instructions apply to the hazardous-duty versions of flap-type flow meter KFS-EM Ex. The explosion protection **applies solely to devices made of steel and stainless steel designed for installation between flanges.**

They are additional and supplementary to the Installation and Operating Instructions for the non-hazardous-duty versions.

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in the Installation and Operating Instructions for the non-hazardous-duty version apply unchanged unless excluded or superseded by these Instructions.

The indicators for Series KFS-EM Ex flow meters are in conformity with the European Directive 94/9/EC (ATEX 100a) and in accordance with European Standard EN 50XXX have been tested for use in hazardous areas under

TÜV 05 ATEX 7195

by TÜV Rheinland (Rhineland Technical Inspectorate).

These approvals together with their boundary conditions must be observed without fail (see also Annex A.1 "EC type examination certificate").

Attention!

Assembly, installation, start-up and maintenance of explosion-protected equipment may only be carried out by competent persons!



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KFS-EM Ex

2. Main safety-relevant characteristics

2.1. Category / Zone

The flap-type flow meter is designed for use in Category 2 (use in Zone 1). The measuring part may also be filled with flammable liquids, provided that a potentially explosive atmosphere (Zone 0) is not present continuously or for a long duration in the measuring part.

2.2. Types of protection

The circuits of the electrical signal outputs (transmitters) and contacts (slot initiators) are designed in Intrinsic Safety type of protection of Category "ia". The measuring part is designed in Category "c" type of protection.

2.3. Temperature classes

Depending on temperature class and ambient temperature, flap-type flow meters of Type KFS-EM Ex are approved for the process temperatures listed in Table 1 (see Section O); the Table includes the following parameters for determination of the allowable temperature class:

- Ambient temperature T_{amb}
- Process temperature T_m
- Meter size DN
- Heat resistance of the cables

Where several built-in intrinsically safe devices are used, the User shall take as a basis the data of the least favourable device.





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3. Identifying marking

The complete device is marked on the indicator part with the rating plate reproduced below:

 Kirchner und Tochter D-47228 Duisburg www.kt-web.de	KFS-EM Ex		ESK2A	
	Jahr 11	SN 10265-001-11	P _{max}	U _i < 30 V
	Tag-No		40 bar	i _i < 100 mA
	CE ⁰⁰³⁵ ₀₀₈₅  TÜV 05 ATEX 7195 Tamb: -20° C ... +70° C			P _i < 1000 mW
				C _i < 20 nF
				L _i ~ 0 µH

CE ⁰⁰³⁵ ₀₀₈₅

CE symbol

superscripted: notified body re explosion protection

subscripted: notified body re Pressure Equipment Directive 97/23/EG

Jahr Year of manufacture

P max Max. allowable operating pressure

Tag-No Measuring point marking

SN Serial number

Composition of the serial number: nnnnn - mmm - yy

Example:

10265-001-11

Order No. 10265,

Device No. 001 in the order,

with year of manufacture 2011.

All devices in hazardous areas with contacts and/or 4-20 mA output shall be marked by using appropriate installation material.



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4. Assembly and installation

All assembly and installation work shall be carried out in accordance with applicable installation standards for hazardous areas (e.g. EN 60079-14) by specialist personnel who have received training in explosion protection.

The directions and information given in the Installation and Operating Instructions, in the Supplementary Installation and Operating Instructions (Ex) as well as in the EC type examination certificate (see Annex 8.1) shall be observed without fail.

Special attention is drawn to the following points for installation and assembly:

The indicator part must be earthed. This is carried out e.g. by way of a wire jumper between the flange on the indicator part and a pipe flange on the main pipeline with cable lugs appropriate to the bolted connection (not included with the flow meter!).

4.1. Electrical connection

The certified intrinsically safe equipment for the flap-type flowmeter KFS-EM Ex may only be connected to separated, intrinsically safe circuits with the following maximum values:

Identification data					
Built-in equipment	U_i [V]	I_i [mA]	P_i [mW]	C_i [nF]	L_i [μ H]
ESK2A	≤ 30	≤ 100	≤ 1000	≤ 20	~ 0

Table 1: Connection data ESK2D

4.2. Terminal assignment

Electrical connection of the built-in intrinsically safe equipment is described in the Installation and Operating Instructions for the flap-type flow meter.

4.3. Connecting cables

The connecting cables for the intrinsically safe circuits must be selected in line with the valid installation standard (e.g. EN 60079-14). Summation current between different intrinsically safe circuits of the flap-type flow meter shall be ruled out.





4.4. Assembly of screwed cable gland

Before inserting the cable for the contacts into the indicator-device, the screwed cable glands have to be assembled.

4.4.1. Data of the screwed cable gland:

Size	M16x1,5
Degree of protection	IP68, acc. to EN 60529
Clamping- and sealingrange	2 - 6 mm
Torque M	4 Nm
Colour sealing gasket	grey
Temperature range	-20°C to +80°C

Table 2. Data of screwed cable gland

4.4.2. Assembly

To assemble the screwed cable gland perform these activities:

1. Screw screwed cable gland into the housing (A)
- Torque M: 4 Nm.
2. Put cable through screwed cable gland into the indicator device.
3. Tighten nutcap (B)
- Torque M: 4 Nm.

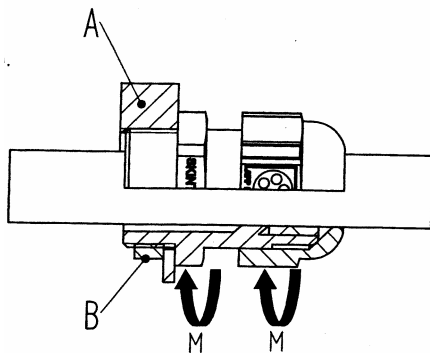


Figure 2: Screwed cable gland



Use only tightly wired cables and wires to be introduced.
The operator must ensure the relief for the wires.
The maximum thermal load of introduced cables and wires must be observed.





Start-up

Before starting up the device, carry out the following checks and inspections:

1. Suitability of the materials used for the measuring part and the gasket materials used for adequate resistance to corrosion from the process product.
2. Correct connection of the built-in electrical equipment.

5. Preventive maintenance

5.1. Indicator

The indicator part is maintenance-free 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:

1. Inspection of the casing, cable entry glands and the incoming lines for signs of corrosion or damage,
2. Check of the measuring part for leaks,
3. Inclusion of the flow meter in the periodic pressure testing of the process pipe.

5.2. Cleaning of the Indicator



If you want to clean the indicator, please note the following.

To prevent electrostatic charge by cleaning the indicator screen, it is important to use only a moist cloth.

5.3. Measuring part

The measuring part is maintenance-free under normal operating conditions and when used for the intended purpose. Depending on the application, however, the measuring function may in unfavourable cases become impaired by soiling of the flap.

The measuring part should be cleaned as described in the Installation and Operating Instructions for the non-hazardous-duty versions. The measuring part must be dismantled before it can be cleaned. In this connection, follow the directions for replacement of the complete device (see Section Maintenance in the Installation and Operating Instructions for the flap-type flow meter).



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6. Dismantling

6.1. Replacement of the indicator part

Due to the modular construction of the flap type flow meters, the indicator and, if necessary, the electrical equipment built into the indicator can be replaced with identical replacement parts satisfying safety requirements (CAUTION: possible loss of measuring accuracy!)

The measuring part can remain in the pipeline. This also applies to pressurized pipes. Replacement and dismantling should if possible be carried out when the device is not in a powered state. If that is not possible, be sure to observe the boundary conditions for Intrinsic Safety (e.g. no earthing or interconnection of different intrinsically safe circuits) during dismantling. When replacing the indicator of a pressurized device, pay special attention to the disconnection point (see Installation and Operating Instructions): detach the indicator part from the two brackets located on the outside of the indicator casing.

6.2. Replacement of complete device

The same requirements as described in Section Maintenance in the Installation and Operating Instructions for the flap-type flow meter are applicable to the indicator.

NOTE!

Pressurized pipes to be depressurized before dismantling the measuring part.

Avoid uncontrolled discharge of residual liquid from the measuring part. In the case of environmentally critical process products, carefully decontaminate the wetted parts of the device after dismantling.

Dismantling and installation are the responsibility of the Operator.

7. 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.





8. Annex

8.1. Type examination certificate




TÜV Rheinland Group

(1) **EG-Baumusterprüfbescheinigung**

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

(3) EG-Baumusterprüfbescheinigungsnummer



TÜV 05 ATEX 7195

(4) **Gerät:** Klappendurchflussmessgerät KFS M9..... EEx

(5) **Hersteller:** Kirchner & Tochter GmbH

(6) **Anschrift:** 47228 Duisburg
Dieselstr.17

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

(8) Die TÜV CERT-Zertifizierungsstelle für Ex-Schutz-Produkte der TÜV Industrie Service GmbH, TÜV Rheinland Group, bescheinigt als benannte Stelle Nr. 0035 nach Artikel 9 der Richtlinie des Rates der Europäischen Gemeinschaften vom 23. März 1994 (94/9/EG) die Einhaltung 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 Nr.: 194/Ex 195.00 / 05 festgelegt.

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

EN 60079-0: 2004

EN 50020: 2002

(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 Prüfung des festgelegten Gerätes gemäß Richtlinie 94/9/EG. Weitere Anforderungen dieser Richtlinie gelten für die Herstellung und das Inverkehrbringen dieses Gerätes. Diese Anforderungen werden durch diese Bescheinigung nicht abgedeckt.

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

Ex II 2 G

Ex ia IIC T6

TÜV CERT-Zertifizierungsstelle für Explosionsschutz

Köln, 11.08.05

Klaus Weijngfeld
Dipl.-Ing. Klaus Weijngfeld



Diese EG-Baumusterprüfbescheinigung hat ohne Unterschrift und Stempel keine Gültigkeit
Diese EG-Baumusterprüfbescheinigung darf nur unverändert vortreten werden. Auszüge und Änderungen bedürfen der Genehmigung der
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8.2. 1. Addendum for KFS-EM Ex

		TÜV Rheinland Group
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1. Ergänzung
gemäß Richtlinie 94/9/EG Anhang III Ziffer 6
zur EG-Baumusterprüfbescheinigung TÜV 05 ATEX 7195

Gerät: Klappendurchflussmessgerät

Kennzeichnung: KFS - EM EEx

Hersteller: Kirchner & Tochter GmbH

Anschrift: 47228 Duisburg

Beschreibung der Ergänzungen und Änderungen:
Die ursprüngliche Typenbezeichnung KFS M9 ESKII EEx hat sich wie folgt geändert in:

KFS - EM EEx

Technische Daten

Keine Änderung

Prüfbericht-Nr. 194/Ex 195.01.05

TÜV CERT-Zertifizierungsstelle für Explosionsschutz Köln, 21. Dezember 2005


Dipl.-Ing. Heinz Farke



Diese Ergänzung zur EG-Baumusterprüfbescheinigung hat ohne Unterschrift und Stempel keine Gültigkeit
Diese Ergänzung zur EG-Baumusterprüfbescheinigung darf nur unverändert verbreitet werden. Auszüge und Änderungen bedürfen der Genehmigung der TÜV Cert-Zertifizierungsstelle für Ex-Schutz-Produkte

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8.3. 2. Addendum for KFS-EM Ex

		TÜV Rheinland Group
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2. Ergänzung
gemäß Richtlinie 94/9/EG Anhang III Ziffer 6
zur EG-Baumusterprüfbescheinigung TÜV 05 ATEX 7195

Gerät: Klappendurchflussmessgerät

Kennzeichnung: KFS - EM EEx

Hersteller: Kirchner & Tochter GmbH

Anschrift: 47228 Duisburg

Beschreibung der Ergänzungen und Änderungen:

Der in den Klappendurchflussmessgerät KFS - EM EEx befindliche elektrische Signalausgang ESKII wird erweitert durch den elektrischen Signalausgang ESK 2A.

Technische Daten

Keine Änderung

Prüfbericht-Nr. 194/Ex 195.02.07

TÜV CERT-Zertifizierungsstelle für Explosionsschutz Köln, 12.03.07


Dipl.-Ing. Klaus Wettingfeld

Diese Ergänzung zur EG-Baumusterprüfbescheinigung hat ohne Unterschrift und Stempel keine Gültigkeit
Diese Ergänzung zur EG-Baumusterprüfbescheinigung darf nur unverändert verbreitet werden. Auszüge und Änderungen bedürfen der Genehmigung der TÜV Cert-Zertifizierungsstelle für Ex-Schutz-Produkte
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8.4. Classes of temperatures

Maximum allowable process temperature and ambient temperatures KFS-EM Ex

Note:

The maximum allowable process temperatures listed in the Table apply under the following conditions:

- that the flap-type flow meter is operated in the mounting position intended
- that insulations are confined to the pipeline only. Unobstructed ventilation of the indicator part must be ensured.

KFS-EM Ex

Temperature Class to EN 50014	T6		T5		T4		T3		T2, T1		
Max. allowed ambient temperature T_{amb} [°C]	≤ 40	≤ 60	≤ 40	≤ 60	≤ 60	≤ 60	≤ 40	≤ 60	≤ 40	≤ 60	
	Heat-resistant cables required for T_m [°C] and higher *										
Max. allowed process temperature T_m [°C]	—	145	80	95	130	195	195	200	200		

Table 3: Classes of temperatures

* heat-resistant cable required (continuous operating temperature: 100°C) if measuring part has not been thermally insulated!





The equipment from **Kirchner und Tochter** has been tested in compliance with applicable CE-regulations of the European Community.

The respective declaration of conformity is available on request.

Technical data supplied without liability. The current valid version of our documents can be found under this URL: www.kt-web.de

The **Kirchner und Tochter** QM-System is certified in accordance with DIN-EN-ISO 9001:2008. The quality is systematically adapted to the continuously increasing demands.



Kirchner und Tochter