

(1) EU Type Examination Certificate



- (2) Equipment and protective systems intended for use in potentially explosive atmospheres - **Directive 2014/34/EU**
- (3) EC Type Examination Certificate Number

TÜV 15 ATEX 7805 X

Issue: 01

- (4) Equipment : **Flap type flow meter, type KFS-***-*** Ex***
- (5) Manufacturer : **A. Kirchner & Tochter GmbH**
- (6) Address : **Dieselstrasse 17
D-47228 Duisburg, Germany**
- (7) The type of this product as well as the different permitted versions are specified in the appendix to this EC Type Examination Certificate and the reference documents.
- (8) The certification body for explosion protection at TÜV Rheinland Industrie Service GmbH, as Notified Body No. 0035 in accordance with Article 21 of the Council Directive of 26 February 2014 (2014/34/EU), certifies that the basic health and safety requirements for the design and production of equipment and protective systems intended for use in potentially explosive atmospheres are met in accordance with Annex II of the Directive.
- The results of the test are specified in the confidential test report No. 557/Ex7805.01/15.
- (9) The basic health and safety requirements, with the exception of the requirements listed in the appendix, are fulfilled by compliance with:

**EN 60079-0:2012+A11:2013
EN 1127-1:2011**

**EN 60079-1:2014
EN 13463-1:2009**

**EN 60079-11:2012
EN 13463-5:2011**

- (10) The sign "X" after a certificate number indicates that this equipment is subject to special conditions for safe use, which are specified in the appendix to this certificate.
- (11) This EU Type Examination Certificate relates only to the design and specifications for the construction of the equipment or protection system. Other requirements of this Directive apply to the manufacture and placing on the market of this product. These requirements are not covered by this certificate.
- (12) The marking of the equipment must contain the following information:



II 2G Ex ia IIC T6-T1 Gb or II 2G Ex db IIC T6-T1 Gb and II 2G c IIC T6-T1

II 2G c IIC T6-T1 (only for type KFS Ex)

TÜV Rheinland Certification Body for Explosion Protection

Cologne, 13/08/2018

Dipl.-Ing. Andreas Maschke

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Appendix

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EU Type Examination Certificate

TÜV 15 ATEX 7805 X

Issue: 01

(15) Equipment description


15.1 Equipment and type:

The flap type flow meter, type KFS-***-*** Ex*,

is supplemented by the variants KFS-***-*** Exd:

Type	Accessories
KFS-MH40 Exd	Mechanical indicator M40
KFS-MH40-IK1 Exd, KFS-MH40-IK2 Exd	Mechanical indicator M40 with 1 or 2 inductive limit value switches (2-wire)
KFS-MH40-IK1S Exd, KFS-MH40-IK2S Exd	Mechanical indicator M40 with 1 or 2 inductive limit value switches (3-wire)
KFS-EM Exd	Mechanical indicator M40 and electronic signal output with 4-20 mA signal
KFS-EM-IK1 Exd, KFS-EM-IK2 Exd	Mechanical indicator M40 and electronic signal output with 4-20 mA signal and 1 or 2 inductive limit value switches (2-wire)
KFS-EM-IK1S Exd, KFS-EM-IK2S Exd	Mechanical indicator M40 and electronic signal output with 4-20 mA signal and 1 or 2 inductive limit value switches (3-wire)
KFS-EMZ Exd	Mechanical indicator M40 and electronic signal output with 4-20 mA signal, total counter, I/O module and LC display

with the marking:

 II 2G Ex db IIC T6-T1 Gb
 II 2G c IIC T6-T1

15.2 Description/change:

General product information

The flap type flow meter, type KFS-***-*** Ex, is used to measure the flow of liquids and gases in pipelines. It is only installed as a ring via intermediate flange mounting. A half-round plate is fastened across the direction of flow to a spring-mounted rotating spindle in a flange ring. As the flow rate increases, the flap rotates counter to the restoring force of the spring in the direction of flow.

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The ensuing angle of rotation, depending on the volume rate of flow, is transmitted via a magnetic coupling to the mechanical indicator. The inductive limit value switches can be used to evaluate the maximum and minimum values electronically; 4-20 mA signals can be output with the signal output and binary signals with the additional I/O module as total counter.

The existing intrinsically safe circuits are supplemented by this addition with variants that have the following degree of ignition protection: "flameproof enclosure". The cable entry openings must be closed in accordance with EN 60079-14.

Technical data

1 General data

Allowed operating pressure	1.5 to 40 bar
Nominal diameters of the pipe connections	DN 25 - DN 300

2 Electrical data (functional extra-low voltage PELV)

2.1 KFS-***-*** Exd (IK1 or IK2 option): Inductive limit value switches (2-wire)

Terminals: 1, 2 or 4, 5	Nominal values per circuit $U_N = 5 - 25 \text{ V}$ $I_N \leq 1 / \geq 3 \text{ mA}$ (depending on switching position)
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2.2 KFS-***-*** Exd (IKS1 or IKS2 option): Inductive limit value switches (3-wire)

Terminals: 1, 2, 3 or 4, 5, 6	Nominal values per circuit $U_N = 10 - 30 \text{ V}$ $I_N \leq 100 \text{ mA}$ (depending on switching position)
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2.3 KFS-***-*** Exd (EM option): 4-20 mA signal output

Terminals 11 and 12	$U_N = 14 - 32 \text{ V}$ $I_N = 4 - 20 \text{ mA}$ (standardised 4-20 mA - current signal with superimposed HART [®] communication signal in 2-wire connection)
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2.4 KFS-EMZ Exd

Terminals 11 and 12	$U_N = 14 - 32 \text{ V}$ $I_N = 4 - 20 \text{ mA}$ (standardised 4-20 mA - current signal with superimposed HART [®] communication signal in 2-wire connection)
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and I/O module

Binary output 1, Terminals 1, 3 (OC)	$U_N = 8 - 32 \text{ V}$ (Open Collector, pnp output)
Binary output 2, Terminals 4, 6 (OC)	$I_N \leq 100 \text{ mA}$

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or

Binary output 1, Terminals 1, 3 (NAMUR) $U_N = 8 \text{ V}$
 Binary output 2, Terminals 4, 6 (NAMUR) $I_N \leq 1 / \geq 3 \text{ mA}$ (depending on switching position)

and

Status input, Terminals 7, 8 (Input) $U_N = 8 - 32 \text{ V}$
 Binary output 2, Terminals 4, 6 (NAMUR) $I_N \leq 2 \text{ mA}$

3 Thermal data

Temperature of medium (depending on the instrument version) -25 °C to T_m
 Reference point temperature (ext. equipotential bonding conductor connection on display) -25 °C to T_{Ref}
 Ambient temperature (depending on instrument version) -25 °C to $+65 \text{ °C}$

Maximum allowed temperature of medium T_m [°C]					
TK ▶	T6	T5	T4	T3	T2, T1
T_{amb} [°C] ▶	$\leq 60 \text{ °C}$	$\leq 65 \text{ °C}$	$\leq 65 \text{ °C}$	$\leq 65 \text{ °C}$	$\leq 65 \text{ °C}$
	80	95	130	195	200

Maximum allowed reference point temperature T_{Ref} [°C]			
TK ▶	T6-T1	T6	T5-T1
$T_{connecting\ cable}$ [°C] ▶	Standard [70°C]	Heat-resistant [90 °C]	
	64	74	84

(16) Test Report No. 557/Ex7805.01/15

(17) Special requirements for safe use

1. The flap type flow meter must be integrated into the local equipotential bonding system.
2. The temperature class of the flap type flow meter depends on the selected ambient temperature and temperature of medium; details can be found in the installation and operating instructions.
3. To avoid static charge on the indicator unit, the plastic surface of the flap type flow meter may only be cleaned with a damp cloth.

Additionally for the variants KFS-***-*** Exd

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4. The flap type flow meter must be connected via suitable cable glands which meet the requirements of EN 60079-1 and for which a separate test certificate is available.
5. Cable glands (Pg glands) and sealing plugs of simple design must not be used.
6. Unused openings must be closed, in accordance with EN 60079-1.
7. If the temperature at the inlet parts is more than 70 °C, appropriate temperature-resistant connecting cables must be used.

(18) Basic health and safety requirements

Covered by the above standard.

TÜV Rheinland Certification Body for Explosion Protection Cologne, Germany, 2018-08-13


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