



Translation

**EC-TYPE EXAMINATION CERTIFICATE**



- (1) **EC-TYPE EXAMINATION CERTIFICATE**
- (2) Equipment or Protective System intended for use in potentially explosive atmospheres - **Directive 94/9/EC**
- (3) EC-Type Examination Certificate Number

**TÜV 99 ATEX 1471**

- (4) Equipment or Protective System: Impulse Evaluating Device Type KF\*\*-UF\*-Ex\*\*
- (5) Manufacturer: Pepperl + Fuchs GmbH
- (6) Address: Königsberger Allee 87  
D – 68307 Mannheim

- (7) This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.
- (8) The TÜV Hannover/Sachsen-Anhalt e.V., TÜV Certification Body N° 0032 in accordance with Article 9 of the Council Directive 94/9/EC of March 23, 1994, certifies that this equipment or protective system 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 confidential report N° 99/PX19690.

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

**EN 50 014:1997**

**EN 50 020:1994**

- (10) If the sign "X" is placed after the certification number, it indicates that the equipment or protective system 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 and construction of the specified equipment or protective system. If applicable, further requirements of this Directive apply to the manufacture and supply of this equipment or protective system.
- (12) The marking of the equipment or protective system shall include the following:

 **II (1) G D [EEEx ia] IIC**

TÜV Hannover/Sachsen-Anhalt e.V.  
TÜV CERT-Zertifizierungsstelle  
Am TÜV 1  
D-30519 Hannover

Hannover, 1999-11-08

*Stüwe*

Head of the  
Certification Body





## SCHEDULE

(13)

(14) **EC-TYPE EXAMINATION CERTIFICATE N° TÜV 99 ATEX 1471**

(15) Description of equipment or protective system

The impulse evaluating device type KF\*\*-UF\*-Ex\*.\* is used for the evaluation of impulses of connected transmitter. The impulse evaluating device is not allowed to be installed to be installed in the potentially explosive area.

The highest permissible ambient temperature is 60°C.

### Electrical data

Supply circuit (Terminal 23, 24) or via Power Rail	nominal voltage:	
	U = 20 V .. 90 V d.c.	U <sub>m</sub> = 125 d.c. or
	U = 48 V .. 253 V a.c.	U <sub>m</sub> = 253 V a.c.
	U = 20 V .. 30 V d.c.	U <sub>m</sub> = 40 V d.c.

Current output (terminals 7, 8)	I = 0/4 .. 20 mA, R <sub>max</sub> = 650 Ω,	U <sub>m</sub> = 40 V
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Contact circuits (terminals 10, 11, 12 and 16, 17, 18)	alternating voltage	direct voltage
	U = 253 V	U = 40 V
	I = 2 A	I = 2 A
	P = 506 W	P = 80 W

Output switched (terminals 19, 20, 21)	U = 40 V, I = 50 mA	U <sub>m</sub> = 40 V
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Start up bridging (terminals 13, 14, 15)	passive	U <sub>m</sub> = 40 V
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Interface RS232 (jacked)		U <sub>m</sub> = 40 V
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Input circuit (terminals 1, 3 resp. 4, 6)	in type of protection "Intrinsic Safety" EEx ia IIC/IIB/IIA maximum values:
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input p.a.:	parallel wiring resp.:
U <sub>o</sub> = 10,1 V	U <sub>o</sub> = 10,1 V
I <sub>o</sub> = 13 mA	I <sub>o</sub> = 26 mA
P <sub>o</sub> = 34 mW	P <sub>o</sub> = 68 mW
R <sub>i</sub> = 758 Ω	R <sub>i</sub> = 379 Ω

characteristic line: linear

The effective internal inductance and capacitance is negligibly small.

	per input		
	EEx ia IIA	EEx ia IIB	EEx ia IIC
L <sub>o</sub>	1 H	730 mH	195 mH
C <sub>o</sub>	93 μF	19,4 μF	2,8 μF

	input, parallel		
	EEx ia IIA	EEx ia IIB	EEx ia IIC
L <sub>o</sub>	350 mH	170 mH	46 mH
C <sub>o</sub>	93 µF	19,4 µF	2,8 µF

The above mentioned values of the outer reactances apply only, on condition that the simultaneous appearance of the outer inductance and capacitance does not need to be considered (e.g. in case of lines).

In the case of simultaneous appearance capacitance and inductance in concentrated form the permissible maximum values have to be taken from the following table:

	per Input		
	EEx ia IIA	EEx ia IIB	EEx ia IIC
L <sub>o</sub>	20 mH	10 mH	5 mH
C <sub>o</sub>	3,0 µF	1,5 µF	0,5 µF

	Input, parallel		
	EEx ia IIA	EEx ia IIB	EEx ia IIC
L <sub>o</sub>	20 mH	10 mH	5 mH
C <sub>o</sub>	3,0 µF	1,5 µF	0,5 µF

The input circuits are safely galvanically separated from all other circuits up to a peak crest value of the nominal voltage of 375 V.

(16) Test documents are listed in the test report N° 99/19690.

(17) Special condition for safe use

none

(18) Essential Health and Safety Requirements

no additional ones

Translation

**1. SUPPLEMENT**

<b>to Certificate No.</b>	<b>TÜV 99 ATEX 1471</b>
Equipment:	Impulse Evaluating Device type KF**-UF*-Ex**
Manufacturer:	<b>Pepperl + Fuchs GmbH</b>
Address:	Königsberger Allee 87 68307 Mannheim, Germany
Order number:	8000553321
Date of issue:	2006-10-27

Amendments:

In the future, the impulse evaluating device type KF\*\*-UF\*-Ex\*\* may also be manufactured according to the test documents listed in the test report. The amendments concern the application of an additional printed circuit board for the power supply as well as the change of the already used printed circuit boards.

In the future, the device may also be used in areas which require the application of devices of group I. The suitable marking was complemented.

The electrical data were adapted.

The permissible temperature range is -20 °C to + 60 °C.

Electrical data

Supply circuit (terminals 23, 24)	U = 20 .. 30 V d.c. , U <sub>m</sub> = 40 V	(KFD2)
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U = 20 .. 90 V d.c. , U <sub>m</sub> = 253 V	(KFU8)
or 48 .. 253 V a.c.	

or via Power Rail (terminals PR: 1, 2)	U = 20 .. 30 V d.c. , U <sub>m</sub> = 40 V	(only KFD2)
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Current output (terminals 7, 8)	I = 0/4 .. 20 mA , U <sub>m</sub> = 40 V
	R <sub>max</sub> = 650 Ω

Contact circuits (terminals 10, 11, 12 and 16, 17, 18)	alternating voltage	direct voltage
	U = 253 V AC	U = 40 V
	I = 2 A	I = 2 A
	P = 500 W	P = 80 W
	cos φ ≥ 0.7	resistive load

Transistor outputs (terminals 19, 20 and 20, 21)	U <sub>m</sub> = 40 V
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Control inputs (terminals 13, 14 and 14, 15)	U <sub>m</sub> = 40 V
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Interface RS232 (3.5 mm plug)	U <sub>m</sub> = 40 V
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Interface RS485  
(terminals PR: 3, 5)

$U_m = 40 \text{ V}$

Sum error  
(terminal PR: 4)

$U_m = 40 \text{ V}$

Input circuits  
(terminals 1, 3 resp. 4, 6)

in type of protection „Intrinsic Safety“ EEx ia IIC  
resp. EEx ia I

Maximum values:

per input

2 inputs parallel

$U_o = 10.1 \text{ V}$

$U_o = 10.1 \text{ V}$

$I_o = 13.5 \text{ mA}$

$I_o = 27 \text{ mA}$

$P_o = 34 \text{ mW}$

$P_o = 68 \text{ mW}$

$R_i = 758 \text{ } \Omega$

$R_i = 379 \text{ } \Omega$

Characteristic line: linear

Effective inner inductance:  $L_i =$  negligibly small

Effective inner capacitance:  $C_i =$  negligibly small

per input				
	EEx ia IIC	EEx ia IIB	EEx ia IIA	EEx ia I
$L_o$	195 mH	730 mH	1000 mH	2120 mH
$C_o$	2.87 $\mu\text{F}$	19.4 $\mu\text{F}$	93 $\mu\text{F}$	79 $\mu\text{F}$
2 inputs parallel				
	EEx ia IIC	EEx ia IIB	EEx ia IIA	EEx ia I
$L_o$	46 mH	170 mH	380 mH	600 mH
$C_o$	2.87 $\mu\text{F}$	19.4 $\mu\text{F}$	93 $\mu\text{F}$	79 $\mu\text{F}$

The above mentioned values of the outer reactances apply only on condition that simultaneous appearance of the outer inductance and capacitance does not to be considered (e.g. in case of lines).

In case of simultaneous appearance of capacitance and inductance in concentrated form the permissible maximum values per input or for 2 inputs parallel have to be taken from the following table:

	EEx ia IIC	EEx ia IIB	EEx ia IIA	EEx ia I
$L_o$	5 mH	10 mH	20 mH	20 mH
$C_o$	0.4 $\mu\text{F}$	1.5 $\mu\text{F}$	3.0 $\mu\text{F}$	3.0 $\mu\text{F}$

The intrinsically safe input circuits are safely galvanically separated from other circuits up to a peak crest value of the voltage of 375 V.

The intrinsically safe input circuits are galvanically connected with each other.

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All other data apply unchanged for this supplement.

In the future, the marking of the equipment shall include the following:

 **II (1) G D [EEEx ia] IIC**  
**I (M1) [EEEx ia] I**

The equipment incl. of this amendments meets the requirements of these standards:

**EN 50 014:1997+A1+A2**            **EN 50 020:2002**

(16) The test documents are listed in the test report No. 06 YEX 553321.

(17) Special conditions for safe use

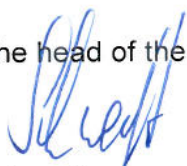
no additional ones

(18) Essential Health and Safety Requirements

no additional ones

TÜV NORD CERT GmbH, Langemarckstraße 20, 45141 Essen, accredited by the central office of the countries for safety engineering (ZLS), Ident. Nr. 0044, legal successor of the TÜV NORD CERT GmbH & Co. KG Ident. Nr. 0032

The head of the certification body



Schwedt

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Translation  
**2. SUPPLEMENT**

**to Certificate No.** TÜV 99 ATEX 1471  
**Equipment:** Impulse Evaluating Device type KF\*\*-UF\*-Ex\*\*.\*

**Manufacturer:** Pepperl + Fuchs GmbH  
**Address:** Lilienthalstrasse 200  
 68307 Mannheim  
 Germany

**Order number:** 8000555330  
**Date of issue:** 2009-09-25

Amendments:

In the future the device may also be manufactured according to the test documents listed in the test report. The changes concern the modification of a component. The standards used for assessment had also been updated.

The equipment incl. of this supplement meets the requirements of these standards:

<b>EN 60079-0:2006</b>	<b>EN 60079-11:2007</b>	<b>EN 60079-26:2007</b>
<b>EN 61241-0:2006</b>	<b>EN 61241-11:2006</b>	

In the future the marking must include the following:

**Ex** II (1) G [Ex ia] IIC resp.  
 II (1) D [Ex iaD] resp.  
 I (M1) [Ex ia] I

The electrical data had been changed, all other information apply unchanged for this supplement.

Technical data

The permissible temperature range is -20 °C to + 60 °C.

Supply circuit (terminals 23, 24)	U = 20 .. 30 V d.c. , U <sub>m</sub> = 40 V (KFD2)
	U = 20 .. 90 V d.c. , U <sub>m</sub> = 253 V (KFU8)
	or 48 .. 253 V a.c.
or via Power Rail (terminals PR: 1, 2)	U = 20 .. 30 V d.c. , U <sub>m</sub> = 40 V (only KFD2)

2. Supplement to Certificate No. TÜV 99 ATEX 1471

Current output (terminals 7, 8)  $I = 0/4 \dots 20 \text{ mA}$ ,  $U_m = 40 \text{ V}$   
 $R_{max} = 650 \Omega$

Contact circuits (terminals 10, 11, 12 And 16, 17, 18)

alternating voltage	direct voltage
$U = 253 \text{ V AC}$	$U = 40 \text{ V}$
$I = 2 \text{ A}$	$I = 2 \text{ A}$
$P = 500 \text{ W}$	$P = 80 \text{ W}$
$\cos \varphi \geq 0.7$	resistive load

Transistor outputs (terminals 19, 20 and 20, 21)  $U_m = 40 \text{ V}$

Control inputs (terminals 13, 14 and 14, 15)  $U_m = 40 \text{ V}$

Interface RS232 (3.5 mm plug)  $U_m = 40 \text{ V}$

Interface RS485 (terminals PR: 3, 5)  $U_m = 40 \text{ V}$

Sum error (terminal PR: 4)  $U_m = 40 \text{ V}$

Input circuits (terminals 1, 3 resp. 4, 6) in type of protection „Intrinsic Safety“ Ex ia IIC resp. Ex ia I

Maximum values:  
per input 2 inputs parallel  
 $U_o = 10.1 \text{ V}$   $U_o = 10.1 \text{ V}$   
 $I_o = 13.5 \text{ mA}$   $I_o = 27 \text{ mA}$   
 $P_o = 34 \text{ mW}$   $P_o = 68 \text{ mW}$   
 $R_i = 758 \Omega$   $R_i = 379 \Omega$   
Characteristic line: linear

Effective inner inductance:  $L_i =$  negligibly small  
Effective inner capacitance:  $C_i =$  negligibly small

per input				
	Ex ia IIC	Ex ia IIB	Ex ia IIA	Ex ia I
$L_o$	195 mH	730 mH	1000 mH	1000 mH
$C_o$	2.87 $\mu\text{F}$	19.4 $\mu\text{F}$	93 $\mu\text{F}$	79 $\mu\text{F}$
2 inputs parallel				
	Ex ia IIC	Ex ia IIB	Ex ia IIA	Ex ia I
$L_o$	46 mH	170 mH	380 mH	600 mH
$C_o$	2.87 $\mu\text{F}$	19.4 $\mu\text{F}$	93 $\mu\text{F}$	79 $\mu\text{F}$

The above mentioned values of the outer reactances apply only on condition that simultaneous



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appearance of the outer inductance and capacitance does not to be considered (e.g. in case of lines).

In case of simultaneous appearance of capacitance and inductance in concentrated form the permissible maximum values per input or for 2 inputs parallel have to be taken from the following table:

	Ex ia IIC	Ex ia IIB	Ex ia IIA	Ex ia I
$L_o$	5 mH	10 mH	20 mH	20 mH
$C_o$	0.4 $\mu$ F	1.5 $\mu$ F	3.0 $\mu$ F	3.0 $\mu$ F

The intrinsically safe input circuits are safely galvanically separated from other circuits up to a peak crest value of the voltage of 375 V.

The intrinsically safe input circuits are galvanically connected with each other.

(16) The test documents are listed in the test report No. 09 203 555330.

(17) Special conditions for safe use

none

(18) Essential Health and Safety Requirements

no additional ones

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The head of the certification body



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Translation

### 3. SUPPLEMENT

**to Certificate No.** TÜV 99 ATEX 1471

**Equipment:** Impulse Evaluating Device type KF\*\*-UF\*-Ex\*\*

**Manufacturer:** Pepperl + Fuchs GmbH

**Address:** Lilienthalstrasse 200  
68307 Mannheim  
Germany

**Order number:** 8000414252

**Date of issue:** 2014-10-01


Amendments:

In the future the device may also be manufactured and operated according to the test documents listed in the test report. The changes concern the exchange of some components of the device. Furthermore the standards used for assessment had been updated.

The equipment incl. of this supplement meets the requirements of these standards:

**EN 60079-0:2012**                      **EN 60079-11:2012**                      **EN 60079-26:2007**

The marking is as follows:

 II (1) G [Ex ia Ga] IIC      resp.  
II (1) D [Ex ia Da] IIIC      resp.  
I (M1) [Ex ia Ma] I

#### Technical data

Permissible range of the ambient temperature: -20 °C to +60 °C.

Supply circuit (terminals 23, 24)	U	= 20 .. 30 V d.c. , U <sub>m</sub> =	40 V	(KFD2)
	U or	= 20 .. 90 V d.c. , U <sub>m</sub> = 48 .. 253 V a.c.	253 V	(KFU8)
or via Power Rail (terminals PR: 1, 2)	U	= 20 .. 30 V d.c. , U <sub>m</sub> =	40 V	(only KFD2)
Current output (terminals 7, 8)	I R <sub>max</sub>	= 0/4 .. 20 mA , U <sub>m</sub> = = 650 Ω	40 V	

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Contact circuits (terminals 10, 11, 12 And 16, 17, 18)	alternating voltage	direct voltage
	U = 253 V AC I = 2 A P = 500 W U <sub>m</sub> = 253 V cos φ ≥ 0.7	U = 40 V I = 2 A P = 80 W U <sub>m</sub> = 253 V resistive load
Transistor outputs (terminals 19, 20 and 20, 21)		U <sub>m</sub> = 40 V
Control inputs (terminals 13, 14 and 14, 15)		U <sub>m</sub> = 40 V
Interface RS232 (3.5 mm plug)		U <sub>m</sub> = 40 V
Interface RS485 (terminals PR: 3, 5)		U <sub>m</sub> = 40 V
Sum error (terminal PR: 4)		U <sub>m</sub> = 40V

Input circuits  
(terminals 1, 3 resp. 4, 6)

in type of protection „Intrinsic Safety“ Ex ia IIC,  
Ex ia IIIC or Ex ia I  
Maximum values:  
per input 2 inputs parallel

U <sub>o</sub> = 10.1 V	U <sub>o</sub> = 10.1 V
I <sub>o</sub> = 13.5 mA	I <sub>o</sub> = 27 mA
P <sub>o</sub> = 34 mW	P <sub>o</sub> = 68 mW
R <sub>i</sub> = 758 Ω	R <sub>i</sub> = 379 Ω

Characteristic line: linear

Effective inner inductance: L<sub>i</sub> = negligibly small  
Effective inner capacitance: C<sub>i</sub> = negligibly small

per input				
	Ex ia IIC	Ex ia IIB resp. IIIC	Ex ia IIA	Ex ia I
L <sub>o</sub>	195 mH	730 mH	1000 mH	1000 mH
C <sub>o</sub>	2.87 μF	19.4 μF	93 μF	79 μF
2 inputs parallel				
	Ex ia IIC	Ex ia IIB resp. IIIC	Ex ia IIA	Ex ia I
L <sub>o</sub>	46 mH	170 mH	380 mH	600 mH
C <sub>o</sub>	2.87 μF	19.4 μF	93 μF	79 μF

The above mentioned values of the outer reactance apply only on condition that simultaneous appearance of the outer inductance and capacitance does not need to be considered.

3. Supplement to Certificate No. TÜV 99 ATEX 1471

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In case of simultaneous appearance of capacitance and inductance in concentrated form the permissible maximum values per input or for 2 inputs parallel have to be taken from the following table:

	Ex ia IIC	Ex ia IIB resp. IIIC	Ex ia IIA	Ex ia I
$L_o$	5 mH	10 mH	20 mH	20 mH
$C_o$	0.4 $\mu$ F	1.5 $\mu$ F	3.0 $\mu$ F	3.0 $\mu$ F

The intrinsically safe input circuits are safely galvanically separated from other circuits up to a peak crest value of the voltage of 375 V.

The intrinsically safe input circuits are galvanically connected with each other.

(16) The test documents are listed in the test report No. 14 203 110937.

(17) Special conditions for safe use

None

(18) Essential Health and Safety Requirements

No additional ones

TÜV NORD CERT GmbH, Langemarckstraße 20, 45141 Essen, notified by the central office of the countries for safety engineering (ZLS), Ident. Nr. 0044, legal successor of the TÜV NORD CERT GmbH & Co. KG Ident. Nr. 0032

The head of the notified body



Andreas Meyer

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