IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: IECEx PTB 11.0091X

Issue No: 1

Certificate history:
Issue No. 1 (2017-05-29)
Issue No. 0 (2011-11-17)

Status: **Current**

Date of Issue: **2017-05-29**

Applicant: **Pepperl+Fuchs GmbH**
Lilienthalstrasse 200
68307 Mannheim
Germany

Equipment: **Slot-type proximity sensors**
Optional accessory: *Types SJ... and SC...*

Type of Protection: **Intrinsic Safety**

Marking:

Ex ia IIC T6...T1 Ga
or
Ex ia IIC T6...T1 Gb
or
Ex ia IIIC T135°C Da
or
Ex ib IIIC T135°C Db
or
Ex ia I Mb

Approved for issue on behalf of the IECEx Certification Body: Dr.-Ing. F. Lienesch

Position: Head of Department "Explosion Protection in Sensor Technology and Instrumentation"

Signature:
(for printed version)

Date:

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website.

Certificate issued by:

Physikalisch-Technische Bundesanstalt (PTB)
Bundesallee 100
38116 Braunschweig
Germany

Physikalisch-Technische Bundesanstalt
Braunschweig und Berlin

IECEx Certificate of Conformity

Certificate No:	IECEx PTB 11.0091X	Issue No: 1
Date of Issue:	**2017-05-29**	Page 2 of 5
Manufacturer:	**Pepperl+Fuchs GmbH** Lilienthalstrasse 200 68307 Mannheim **Germany**	

Additional Manufacturing location(s):

Pepperl+Fuchs Asia Pte. Ltd. P+F Building 18 Ayer Rajah Crescent Singapore 139942 Singapore	**PT. Pepperl+Fuchs Bintan** Jl. Asoka SD 56 Bintan Industrial Estate Lobam, Bintan Island Indonesia	**Pepperl+Fuchs Co. Ltd.** Lot S 12-16a, Street 20 Tan Thuan EPZ Ward tan Thuan Dong, District 7 Ho Chi Minh City Viet Nam	**Pepperl+Fuchs Manufacturing s.r.o.** Tovarni 10 54102 Trutnov Czech Republic	**Pepperl+Fuchs GmbH** Lilienthalstrasse 200 68307 Mannheim Germany

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

STANDARDS:

The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

IEC 60079-0 : 2011 Edition:6.0	Explosive atmospheres - Part 0: General requirements
IEC 60079-11 : 2011 Edition:6.0	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"

*This Certificate **does not** indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.*

TEST & ASSESSMENT REPORTS:

A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in

Test Report:

DE/PTB/ExTR11.0101/01

Quality Assessment Report:

DE/PTB/QAR06.0008/07

IECEx Certificate of Conformity

Certificate No: IECEx PTB 11.0091X Issue No: 1

Date of Issue: 2017-05-29

Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

The slot-type proximity sensors of types SJ… and SC… are used to convert mechanical displacements into an electrical signal.

The sensors are supplied from an intrinsically safe circuit and they are suitable to be used in hazardous areas of group I, II and group III.

The area classification of the slot-type sensors depends on the level of protection of the intrinsically safe circuit the sensors are connected to.

For further information, reference is made to the annex

SPECIFIC CONDITIONS OF USE: YES as shown below:

For special conditions, reference is made to the annex.

IECEx Certificate of Conformity

Certificate No: IECEx PTB 11.0091X Issue No: 1

Date of Issue: **2017-05-29**

DETAILS OF CERTIFICATE CHANGES (for issues 1 and above):

to expand the products used in dust hazardous area
to be compliant to IEC 60079-0:2011, 6th Edition
Issue 1 combines the complete certification data of the products, therefore the documentation to Issue 0 is no longer applied
The harmonized Standard IEC 60079-26:2014, 3rd Edition is no longer listed in this CoC, because the
product´s relevant requirements of the Standard are moved to IEC 60079-0
Simplification of type names of the Slot-type proximity sensors: deletion of blanks, consistant placeholders "..."
Combination of existing temperature tables for Group II to one Ga/Gb temperature table

IECEx Certificate of Conformity

Certificate No: IECEx PTB 11.0091X Issue No: 1

Date of Issue: **2017-05-29** Page 5 of 5

Additional information:

For thermal and electrical specifications as well as the Special Conditions for safe use, reference is made to the annex.

Annex:

IECEx_PTB_110091_1_attachment.pdf

Applicant: Pepperl+Fuchs GmbH
Lilienthalstraße 200
68307 Mannheim
Germany

Electrical Apparatus: Slot-type proximity sensors
types SJ… and SC…

Electrical data

Evaluation and supply circuit: Only for connection to a certified intrinsically safe circuit

Ex ia IIC/IIB for EPL Ga
resp. Ex ia IIIC for EPL Da
resp. Ex ia IIC/IIB or Ex ib IIC/IIB for EPL Gb
resp. Ex ia IIIC or Ex ib IIIC for EPL Db

Maximum values:

	Type 1	Type 2	Type 3	Type 4
U_i	16 V	16 V	16 V	16 V
I_i	25 mA	25 mA	52 mA	76 mA
P_i	34 mW	64 mW	169 mW	242 mW

Table 1

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For relationship between type of the connected circuit, maximum permissible ambient temperature for group II (EPL Ga/Gb), group III (EPL Da) resp. group I (EPL Mb) equipment and temperature class as well as the effective internal reactances for the individual types of slot-type proximity sensors, reference is made to the following tables:

Table 2: Application as Group I equipment, EPL Mb:

			type 1 Ui = 16V Ii = 25 mA Pi = 34 mW	**type 2** Ui = 16V Ii = 25 mA Pi = 64 mW	**type 3** Ui = 16V Ii = 52 mA Pi = 169 mW	**type 4** Ui = 16V Ii = 76 mA Pi = 242 mW
type	**Ci**	**Li**	**maximum permissible ambient temperature in °C**			
	[nF]	[µH]	T	T	T	T
SC2-N0...	150	150	100	100	75	54
SC3,5-N0-Y...	150	150	100	100	75	54
SC3,5...-N0...	150	150	100	100	89	74
SJ1,8-N-Y...	30	100	100	100	78	57
SJ2,2-N...	30	100	100	100	78	57
SJ2-N...	30	100	100	100	78	57
SJ3,5-...-N...	50	250	100	100	89	74
SJ3,5-H...	50	250	100	100	89	74
SJ5-...-N...	50	250	100	100	89	74
SJ5-K...	50	550	100	100	82	63
SJ10-N...	50	1000	100	100	82	63
SJ15-N...	150	1200	100	100	82	63
SJ30-N...	150	1250	100	100	82	63

Table 2: Application as Group I equipment, EPL Mb

Table 3: Application as Group II equipment, EPL Ga/Gb:

				type 1 Ui = 16 V Ii = 25 mA Pi = 34 mW			type 2 Ui = 16 V Ii = 25 mA Pi = 64 mW			type 3 Ui = 16 V Ii = 52 mA Pi = 169 mW			type 4 Ui = 16 V Ii = 76 mA Pi = 242 mW		
				maximum permissible ambient temperature in °C for application in temperature class											
Type	**EPL**	**Ci / nF**	**Li / µH**	**T6**	**T5**	**T4-T1**	**T6**	**T5**	**T4-T1**	**T6**	**T5**	**T4-T1**	**T6**	**T5**	**T4-T1**
SC2-N0...	Ga/Gb	150	150	72	87	100	65	80	100	40	55	75	23	38	54
SC3,5-N0-Y...	Ga/Gb	150	150	72	87	100	65	80	100	40	55	75	23	38	54
SC3,5...-N0...	Ga/Gb	150	150	73	88	100	66	81	100	45	60	89	30	45	74
SJ1,8-N-Y...	Gb	30	100	73	88	100	67	82	100	45	60	78	30	45	57
SJ2,2-N...	Gb	30	100	73	88	100	67	82	100	45	60	78	30	45	57
SJ2-N...	Ga/Gb	30	100	73	88	100	67	82	100	45	60	78	30	45	57
SJ3,5-...-N...	Ga/Gb	50	250	73	88	100	66	81	100	45	60	89	30	45	74
SJ3,5-H...	Gb	50	250	73	88	100	66	81	100	45	60	89	30	45	74
SJ5-...-N...	Ga/Gb	50	250	73	88	100	66	81	100	45	60	89	30	45	74
SJ5-K...	Ga/Gb	50	550	72	87	100	66	81	100	42	57	82	26	41	63
SJ10-N...	Ga/Gb	50	1000	72	87	100	66	81	100	42	57	82	26	41	63
SJ15-N...	Ga/Gb	150	1200	72	87	100	66	81	100	42	57	82	26	41	63
SJ30-N...	Ga/Gb	150	1250	72	87	100	66	81	100	42	57	82	26	41	63

Table 3: Application as Group II equipment, EPL Ga/Gb

Table 4: Application as Group III equipment, EPL Da:

			type 1 Ui = 16V Ii = 25 mA Pi = 34 mW	type 2 Ui = 16V Ii = 25 mA Pi = 64 mW	type 3 Ui = 16V Ii = 52 mA Pi = 169 mW	type 4 Ui = 16V Ii = 76 mA Pi = 242 mW
type	**Ci**	**Li**	**maximum permissible ambient temperature in °C**			
	[nF]	[µH]	T	T	T	T
SC2-N0...	150	150	100	100	75	54
SC3,5-N0-Y...	150	150	100	100	75	54
SC3,5...-N0...	150	150	100	100	89	74
SJ1,8-N-Y...	30	100	100	100	78	57
SJ2,2-N...	30	100	100	100	78	57
SJ2-N...	30	100	100	100	78	57
SJ3,5-...-N...	50	250	100	100	89	74
SJ3,5-H...	50	250	100	100	89	74
SJ5-...-N...	50	250	100	100	89	74
SJ5-K...	50	550	100	100	82	63
SJ10-N...	50	1000	100	100	82	63
SJ15-N...	150	1200	100	100	82	63
SJ30-N...	150	1250	100	100	82	63

Table 4: Application as Group III equipment, EPL Da

The dots in the labelling represent free definable parameters. This free definable parameters can be omitted or replaced by letters or digits.

When assigning the actual sensor to the table use the model description which describes the sensor best. Letters and digits describe the different types according to the model description key.

The sum of all capacitances and inductances, including tolerance and a 10 m cable, result to the given values for Ci and Li shown above.

Special conditions for safe use:

1. For relationship between type of the connected circuit, maximum permissible ambient temperature and temperature class as well as the effective internal reactances for the individual types of Slot-type proximity sensors, reference is made to tables 2 to 4 given in this attachment to IECEx PTB 11.0091X Issue 1 and in the operating instructions manual.

2. Appropriate measures need to be taken to protect the Slot-type proximity sensors against mechanical damage due to impact if they are used within an ambient temperature range between – 60 °C and – 20 °C. An ambient temperature below – 60°C is not permissible.

3. The connection facilities of the Slot-type proximity sensors shall be installed as such that a minimum degree of protection of IP20 according IEC 60529 is complied with.

4. When the following types of Slot-type proximity sensors are applied corresponding to the explosion group, apparatus group and zones tabulated below, inadmissible electrostatic charge of the plastic housing has to be prevented. The equipment shall be labelled with an appropriate warning note:

Type	Group I	Group II Zone 0 (EPL Ga)	Group II Zone 1 (EPL Gb)	Group III
SC2-N0...	-	-	-	-
SC3,5-N0-Y...	-	-	-	III
SC3,5...-N0...	-	-	-	III
SJ1,8-N-Y...	-	not permitted	-	III
SJ2,2-N...	-	not permitted	-	-
SJ2-N...	-	-	-	-
SJ3,5-...-N...	-	-	-	III
SJ3,5-H...	-	not permitted	-	-
SJ5-...-N...	-	-	-	III
SJ5-K...	-	IIC	-	III
SJ10-N...	-	IIC	-	III
SJ15-N...	-	IIC	-	III
SJ30-N...	-	IIA/IIB/IIC	IIC	III

Slot-type proximity sensors which are marked (IIC or IIB or IIA or III) in column “Group …” need to be protected against dangerous electrostatic charges.

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5. For the application of the following Slot-type proximity sensors in hazardous areas of group I, II and III appropriate measures need to be taken to protect the free resin surface against mechanical damage if the free resin surface is accessible after installation:

Type
SC2-N0...
SC3,5-N0-Y...
SC3,5...-N0...
SJ1,8-N-Y...
SJ2-N-Y34361
SJ2-N-Y43896
SJ2-N-Y43897
SJ2,2-N...
SJ3,5-...-N...
SJ3,5-H...
SJ5-...-N...
SJ5-K...
SJ10-N...
SJ15-N...
SJ30-N...

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