IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification System for Explosive Atmospheres

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

Certificate No.: **IECEx PTB 11.0092X**

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Certificate history:
Issue 1 (2017-05-05)
Issue 0 (2011-11-17)

Status: **Current**

Issue No: 2

Date of Issue: 2021-06-30

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

Equipment: **SN-type proximity sensors**

Optional accessory:

Type of Protection: **Intrinsic Safety**

Marking: Ex ia IIC T6...T1 Ga
or
Ex ia IIC T6...T1 Gb
or
Ex ia IIIC T_{200} 135°C Da
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:
(for printed version)

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Certificate issued by:

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

Physikalisch-Technische Bundesanstalt
Braunschweig und Berlin

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Manufacturer: **Pepperl+Fuchs SE**
Lilienthalstrasse 200
68307 Mannheim
Germany

Manufacturing locations:

Pepperl+Fuchs SE
Lilienthalstrasse 200
68307 Mannheim
Germany

Pepperl+Fuchs Asia Pte. Ltd.
18 Ayer Rajah Crescent
Singapore 139942
Singapore

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 equipment 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 60079-0:2017 Explosive atmospheres - Part 0: Equipment - General requirements
Edition:7.0

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

This Certificate **does not** indicate compliance with 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 Reports:

DE/PTB/ExTR11.0102/00 DE/PTB/ExTR11.0102/01 DE/PTB/ExTR11.0102/02

Quality Assessment Report:

DE/PTB/QAR06.0008/15

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EQUIPMENT:
Equipment and systems covered by this Certificate are as follows:

The SN-type proximity sensors 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 SN-type proximity sensors depends on the level of protection of the intrinsically safe circuits 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

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DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)
standard update

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

Annex:

IECEx_PTB_110092_2_attachment.pdf

Applicant: Pepperl+Fuchs SE
Lilienthalstrasse 200
68307 Mannheim
Germany

Electrical Apparatus: SN-type proximity sensors
types NJ… and SJ…

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

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
NJ2-11-SN...	50	150	100	100	89	74
NJ2-11-SN-G...	50	150	100	100	81	63
NJ2-12GK-SN...	50	150	100	100	80	61
NJ3-18GK-S1N...	70	200	100	100	80	61
NJ4-12GK-SN...	70	150	100	100	80	61
NJ5-18GK-SN...	120	200	100	100	80	61
NJ5-30GK-S1N...	100	200	100	100	80	61
NJ6-22-SN...	110	150	100	100	80	61
NJ6-22-SN-G...	110	150	100	100	81	63
NJ6S1+U...+N...	180	150	100	100	80	61
NJ8-18GK-SN...	120	200	100	100	80	61
NJ10-30GK-SN...	120	150	100	100	80	61
NJ15-30GK-SN...	120	180	100	100	80	61
NJ15S+U…+N...	180	150	100	100	89	74
NJ20S+U...+N...	200	150	100	100	89	74
NJ40-FP-SN...	370	300	100	100	89	74
SJ2-SN...	30	100	100	100	78	57
SJ2-S1N...	60	100	100	100	78	57
SJ3,5-S1N...	30	100	100	100	89	74
SJ3,5-SN...	30	100	100	100	89	74

The dots in the labelling represent free definable parameters. These 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.

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**
NJ2-11-SN...	Ga/Gb	50	150	73	88	100	66	81	100	45	60	89	30	45	74
NJ2-11-SN-G...	Ga/Gb	50	150	76	91	100	73	88	100	62	77	81	54	63	63
NJ2-12GK-SN...	Ga/Gb	50	150	73	88	100	69	84	100	51	66	80	39	54	61
NJ3-18GK-S1N...	Ga/Gb	70	200	73	88	100	69	84	100	51	66	80	39	54	61
NJ4-12GK-SN...	Ga/Gb	70	150	73	88	100	69	84	100	51	66	80	39	54	61
NJ5-18GK-SN...	Ga/Gb	120	200	73	88	100	69	84	100	51	66	80	39	54	61
NJ5-30GK-S1N...	Ga/Gb	100	200	73	88	100	69	84	100	51	66	80	39	54	61
NJ6-22-SN...	Ga/Gb	110	150	73	88	100	69	84	100	51	66	80	39	54	61
NJ6-22-SN-G...	Ga/Gb	110	150	76	91	100	73	88	100	62	77	81	54	63	63
NJ6S1+U...+N...	Ga/Gb	180	150	73	88	100	69	84	100	51	66	80	39	54	61
NJ8-18GK-SN...	Ga/Gb	120	200	73	88	100	69	84	100	51	66	80	39	54	61
NJ10-30GK-SN...	Ga/Gb	120	150	73	88	100	69	84	100	51	66	80	39	54	61
NJ15-30GK-SN...	Ga/Gb	120	180	73	88	100	69	84	100	51	66	80	39	54	61
NJ15S+U…+N...	Ga/Gb	180	150	73	88	100	66	81	100	45	60	89	30	45	74
NJ20S+U...+N...	Ga/Gb	200	150	73	88	100	66	81	100	45	60	89	30	45	74
NJ40-FP-SN...	Gb	370	300	73	88	100	66	81	100	45	60	89	30	45	74
SJ2-SN...	Ga/Gb	30	100	73	88	100	66	81	100	45	60	78	30	45	57
SJ2-S1N...	Ga/Gb	60	100	73	88	100	66	81	100	45	60	78	30	45	57
SJ3,5-S1N...	Ga/Gb	30	100	73	88	100	66	81	100	45	60	89	30	45	74
SJ3,5-SN...	Ga/Gb	30	100	73	88	100	66	81	100	45	60	89	30	45	74

The dots in the labelling represent free definable parameters. These 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.

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
NJ2-11-SN...	50	150	100	100	71	not permitted
NJ2-11-SN-G...	50	150	100	100	63	not permitted
NJ2-12GK-SN...	50	150	100	100	62	not permitted
NJ3-18GK-S1N...	70	200	100	100	62	not permitted
NJ4-12GK-SN...	70	150	100	100	62	not permitted
NJ5-18GK-SN...	120	200	100	100	62	not permitted
NJ5-30GK-S1N...	100	200	100	100	62	not permitted
NJ6-22-SN...	110	150	100	100	62	not permitted
NJ6-22-SN-G...	110	150	100	100	63	not permitted
NJ6S1+U...+N...	180	150	100	100	62	not permitted
NJ8-18GK-SN...	120	200	100	100	62	not permitted
NJ10-30GK-SN...	120	150	100	100	62	not permitted
NJ15-30GK-SN...	120	180	100	100	62	not permitted
NJ15S+U…+N...	180	150	100	100	71	not permitted
NJ20S+U...+N...	200	150	100	100	71	not permitted
NJ40-FP-SN...	370	300	100	100	71	not permitted
SJ2-SN...	30	100	100	100	59	not permitted
SJ2-S1N...	60	100	100	100	59	not permitted
SJ3,5-S1N...	30	100	100	100	71	not permitted
SJ3,5-SN...	30	100	100	100	71	not permitted

The dots in the labelling represent free definable parameters. These 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 SN-type proximity sensors, reference is made to tables 2 to 4 given in this attachment to IECEx PTB 11.0092X Issue 2 and in the operating instructions manual.
2. Appropriate measures need to be taken to protect the SN-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 SN-type proximity sensors shall be installed as such that a minimum degree of protection of IP20 according IEC 60529 is complied with.
4. Inadmissible electrostatic charge of the plastic enclosures shall be avoided for the application of the following types of SN-type proximity sensors according to the explosion groups and EPL specified in the following Table 5. When the respective types of SN-type proximity sensors are applied in potentially explosive gas atmospheres a corresponding warning note shall be affixed on the SN-type proximity sensors or near the SN-type proximity sensors respectively. When these are applied in potentially explosive gas or dust atmospheres the corresponding notes given in the operating instructions manual shall be considered.

Table 5:

Type	Group I	Group II (EPL Ga)	Group II (EPL Gb)	Group III
NJ2-11-SN...	-	-	-	-
NJ2-11-SN-G...	-	-	-	-
NJ2-12GK-SN...	-	-	-	-
NJ3-18GK-S1N...	-	IIC	-	III
NJ4-12GK-SN-Y197959	-	IIC	-	-
NJ4-12GK-SN-Y197960	-	IIC	-	-
NJ4-12GK-SN...	-	-	-	-
NJ5-18GK-SN...	-	IIC	-	III
NJ5-30GK-S1N...	-	IIC	-	III
NJ6-22-SN...	-	IIC	-	III
NJ6-22-SN-G...	-	-	-	-
NJ6S1+U...+N...	-	IIC	IIC	III
NJ8-18GK-SN...	-	IIC	-	-
NJ10-30GK-SN...	-	IIC	-	III
NJ15-30GK-SN...	-	IIC	-	III
NJ15S+U...+N...	-	IIC	IIC	III
NJ20S+U...+N...	-	IIC	IIC	III
NJ40-FP-SN...	-	not permitted	IIC	III
SJ2-SN...	-	-	-	-
SJ2-S1N...	-	-	-	-
SJ3,5-S1N...	-	-	-	III
SJ3,5-SN...	-	-	-	III

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

5. For the application of the following SN-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
SJ2-SN...
SJ2-S1N...
SJ3,5-S1N...
SJ3,5-SN...

6. Inadmissible electrostatic charge of parts of the metal housing has to be avoided for the following types of SN-type proximity sensors. Dangerous electrostatic charge of parts of the metal housing can be avoided by grounding these parts whereas very small parts of the metal housing (e.g. screws) do not need to be grounded:

Type
NJ2-11-SN-G...
NJ6-22-SN-G...
NJ6S1+U3+N…
NJ6S1+U4+N…
NJ15S+U3+N…
NJ15S+U4+N…
NJ20S+U3+N…
NJ20S+U4+N…
NJ40-FP-SN-P3…
NJ40-FP-SN-P4…

7. The maximum permissible mass fractions of metallic materials are exceeded for the following types of SN-type proximity sensors when applied as EPL Ga-equipment. In hazardous areas requiring the application of EPL Ga-equipment it shall be ensured by appropriate measures that an ignition hazard due to impact or friction effects cannot occur.

Type
NJ6S1+U3+N…
NJ6S1+U4+N…
NJ15S+U3+N…
NJ15S+U4+N…
NJ20S+U3+N…
NJ20S+U4+N…

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