Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

PTB

(1) # EC-TYPE-EXAMINATION CERTIFICATE

(Translation)

(2) Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres - **Directive 94/9/EC**

(3) EC-type-examination Certificate Number:

PTB 00 ATEX 2048 X

(4) Equipment: Cylindrical inductive sensors, types NC... and NJ...

(5) Manufacturer: Pepperl + Fuchs GmbH

(6) Address: D-68307 Mannheim

(7) This equipment and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.

(8) The Physikalisch-Technische Bundesanstalt, notified body No. 0102 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment 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 the confidential report PTB Ex 00-29206.

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

EN 50014:1997 **EN 50020:1994**

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment 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 in accordance with Directive 94/9/EC. Further requirements of this Directive apply to the manufacture and supply of this equipment.

(12) The marking of the equipment shall include the following:

Ex II 2 G EEx ia IIC T6

Zertifizierungsstelle Explosionsschutz
By order:

Braunschweig, September 26, 2000

Dr.-Ing. U. Johannsmeyer
Regierungsdirektor

PHYSIKALISCH-TECHNISCHE BUNDESANSTALT 24

(13) # SCHEDULE

(14) ## EC-TYPE-EXAMINATION CERTIFICATE PTB 00 ATEX 2048 X

(15) Description of equipment

The cylindrical inductive sensors, types NC... and NJ...are used to convert displacements into electrical signals.

The cylindrical inductive sensors may be operated with intrinsically safe circuits certified for categories and explosion groups [EEx ia] IIC or IIB resp. [EEx ib] IIC or IIB. The category as well as the explosion group of the intrinsically safe cylindrical inductive sensors depends on the connected supplying intrinsically safe circuit.

Electrical data

Evaluation and
supply circuit..... type of protection Intrinsic Safety EEx ia IIC/IIB
resp. EEx ib IIC/IIB
only for connection to certified intrinsically safe circuits
maximum values:

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

The assignment of the type of the connected circuit to the maximum permissible ambient temperature and the temperature class as well as the effective internal reactances for the individual types of cylindrical inductive sensors is shown in the following table:

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types	C_i	L_i	type 1			type 2			type 3			type 4		
			maximum permissible ambient temperature in °C for application in temperature class											
	[nF]	[µH]	T6	T5	T4-T1	T6	T5	T4-T1	T6	T5	T4-T1	T6	T5	T4-T1
NCB1,5...M...N0...	90	100	74	89	100	69	84	100	51	66	85	39	54	67
NCB2-12GK...-N0...	90	100	73	88	100	69	84	100	51	66	80	39	54	61
NCB2-12GM...-N0...	90	100	76	91	100	73	88	100	62	77	81	54	63	63
NCN4-12GK...-N0...	95	100	73	88	100	69	84	100	51	66	80	39	54	61
NCN4-12GM...-N0...	95	100	76	91	100	73	88	100	62	77	81	54	63	63
NCB5-18GK...-N0...	95	100	73	88	100	69	84	100	51	66	80	39	54	61
NCB5-18GM...-N0...	95	100	76	91	100	73	88	100	62	77	81	54	63	63
NCN8-18GK...-N0...	95	100	73	88	100	69	84	100	51	66	80	39	54	61
NCN8-18GM...-N0...	95	100	76	91	100	73	88	100	62	77	81	54	63	63
NCB10-30GK..-N0...	105	100	73	88	100	69	84	100	51	66	80	39	54	61
NCB10-30GM..-N0...	105	100	76	91	100	73	88	100	62	77	81	54	63	63
NCN15-30GK...-N0...	110	100	73	88	100	69	84	100	51	66	80	39	54	61
NCN15-30GM...-N0...	110	100	76	91	100	73	88	100	62	77	81	54	63	63
NJ 0,2-10GM-N...	20	50	73	88	100	68	83	100	49	64	67	36	42	42
NJ 0,8-4,5-N...	30	50	73	88	100	68	83	100	49	64	67	36	42	42
NJ 0,8-5GM-N...	30	50	73	88	100	68	83	100	49	64	67	36	42	42
NJ 1,5-6,5...-N...	30	50	73	88	100	68	83	100	49	64	67	36	42	42
NJ 1,5-10GM-N-Y...	20	50	73	88	100	68	83	100	49	64	67	36	42	42
NJ 1,5-8GM-N...	30	50	73	88	100	68	83	100	49	64	67	36	42	42
NJ 1,5-8-N...	20	50	73	88	100	68	83	100	49	64	67	36	42	42
NJ 1,5-18GM-N-D...	50	60	76	91	100	73	88	100	62	77	81	54	63	63
NJ 2-11-N...	45	50	73	88	100	66	81	100	45	60	89	30	45	74
NJ 2-11-N-G...	30	50	76	91	100	73	88	100	62	77	81	54	63	63
NJ 2-12GK-N...	45	50	73	88	100	69	84	100	51	66	80	39	54	61
NJ 2-12GM-N...	30	50	76	91	100	73	88	100	62	77	81	54	63	63
NJ 2-14GM-N...	30	50	76	91	100	73	88	100	62	77	81	54	63	63
NJ 2,5-14GM-N...	30	50	76	91	100	73	88	100	62	77	81	54	63	63
NJ 4-12GK-N...	45	50	73	88	100	69	84	100	51	66	80	39	54	61
NJ 4-14GK-N...	45	50	73	88	100	69	84	100	51	66	80	39	54	61
NJ 4-12GM-N...	45	50	73	88	100	68	83	100	49	64	67	36	42	42
NJ 4-30GM-N-200...	70	100	73	88	100	66	81	100	45	60	89	30	45	74
NJ 5-10-11-N...	70	100	73	88	100	66	81	100	45	60	78	30	45	57
NJ 5-11-N...	45	50	72	87	100	65	80	100	42	57	82	26	41	63
NJ 5-18GK-N...	70	50	73	88	100	69	84	100	51	66	80	39	54	61
NJ 5-18GM-N...	70	50	76	91	100	73	88	100	62	77	81	54	63	63
NJ 6-22-N...	130	100	73	88	100	69	84	100	51	66	80	39	54	61
NJ 8-18GK-N...	70	50	73	88	100	69	84	100	51	66	80	39	54	61

types	C_i [nF]	L_i [µH]	type 1			type 2			type 3			type 4		
			maximum permissible ambient temperature in °C for application in temperature class											
			T6	T5	T4-T1	T6	T5	T4-T1	T6	T5	T4-T1	T6	T5	T4-T1
NJ 8-18GM-N...	70	50	76	91	100	73	88	100	62	77	81	54	63	63
NJ 10-22-N...	130	100	73	88	100	69	84	100	51	66	80	39	54	61
NJ 10-30GK...-N...	140	100	73	88	100	69	84	100	51	66	80	39	54	61
NJ 10-30GM-N...	140	100	76	91	100	73	88	100	62	77	81	54	63	63
NJ 15-30GK...-N...	140	100	73	88	100	69	84	100	51	66	80	39	54	61
NJ 15-30GM-N...	140	100	76	91	100	73	88	100	62	77	81	54	63	63
NJ 25-50-N...	150	140	73	88	100	69	84	100	51	66	80	39	54	61
NJ 20-40-N...	140	140	73	88	100	69	84	100	51	66	80	39	54	61

(16) Test report PTB Ex 00-29206

(17) Special conditions for safe use

1. For the application within a temperature range of -60 °C to -20 °C the cylindrical inductive sensors, types NC... and NJ... must be protected against damage due to impact by mounting into an additional housing.
2. The connection facilities of the cylindrical inductive sensors, types NC... and NJ... shall be installed as such that at least a degree of protection of IP20 according to IEC-publication 60529:1989 is met.
3. The assignment of the type of the connected circuit to the maximum permissible ambient temperature and the temperature class as well as the effective internal reactances for the individual types of cylindrical inductive sensors is shown in the table given under item (15) of this EC-type-examination certifcate.
4. Inadmissible electrostatic charge of parts of the metal housing has to be avoided for the following types of cylindrical inductive sensors. Dangerous electrostatic charges of parts of the metal housing can be avoided by grounding of these parts whereas very small parts of the metal housing (e.g. screws) don't need to be grounded:

NCB1,5...M...N0...	NJ 1,5-6,5...-N...	NJ 4-30GM-N-200...
NCB2-12GM...-N0...	NJ 1,5-10GM-N-Y...	NJ 5-11-N-545...
NCN4-12GM...-N0...	NJ 1,5-8GM-N...	NJ 5-11-N-G...
NCB5-18GM...-N0...	NJ 1,5-8-N...	NJ 5-18GM-N...
NCN8-18GM...-N0...	NJ 1,5-18GM-N-D...	NJ 6-22-N-G...

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NCB10-30GM..-N0...	NJ 2-11-N-G...	NJ 8-18GM-N...
NCN15-30GM...-N0...	NJ 2-12GM-N...	NJ 10-22-N-G...
NJ 0,2-10GM-N...	NJ 2-14GM-N...	NJ 10-30GM-N...
NJ 0,8-4,5-N...	NJ 2,5-14GM-N...	
NJ 0,8-5GM-N...	NJ 4-12GM-N...	

(18) Essential health and safety requirements

Met by the standards mentioned above

Zertifizierungsstelle Explosionsschutz
By order:

Dr.-Ing. U. Johannsmeyer
Regierungsdirektor

Braunschweig, September 26, 2000

1. SUPPLEMENT

according to Directive 94/9/EC Annex III.6

to EC-TYPE-EXAMINATION CERTIFICATE PTB 00 ATEX 2048 X

(Translation)

Equipment: Cylindrical inductive sensors, types NC... and NJ...

Marking: ⟨Ex⟩ **II 2 G EEx ia IIC T6**

Manufacturer: Pepperl + Fuchs GmbH

Address: Königsberger Allee 87
68307 Mannheim; Germany

Description of supplements and modifications

The cylindrical inductive sensors of type series NC... and NJ... , listed as follows, may in future also be used in hazardous areas requiring apparatus of category 1.

The modifications exclusively concern the "Electrical data" (modified maximum permissible ambient temperatures for use as category-1-apparatus, reduction of the intrinsically safe evaluation and supply circuit to category ia) as well as the marking of the following types of cylindrical inductive sensors.

NCB1,5...M...N0...	NCN15-30GM...-N0...	NJ 2-12GM-N...
NCB2-12GM...-N0...	NJ 0,8-5GM-N...	NJ 4-12GM-N...
NCN4-12GM...-N0...	NJ 1,5-6,5...-N...	NJ 5-18GM-N...
NCB5-18GM...-N0...	NJ 1,5-8GM-N...	NJ 8-18GM-N...
NCN8-18GM...-N0...	NJ 2-11-N...	NJ 10-30GM-N...
NCB10-30GM..-N0...	NJ 2-11-N-G...	NJ 15-30GM-N...

In future the marking of the above-listed sensors for application as category-1-apparatus will be:

⟨Ex⟩ **II 1 G EEx ia IIC T6**

The "Special conditions" are also valid for use as category-1-apparatus without changes.

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1. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 00 ATEX 2048 X

Electrical data

Evaluation and supply circuit ..... type of protection Intrinsic Safety EEx ia IIC/IIB
for connection to certified intrinsically safe circuits only
Maximum values:

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

The assignment of the type of the connected circuit to the maximum permissible ambient temperature for use as category-1-apparatus and the temperature class as well as the effective internal reactances for the individual types of cylindrical inductive sensors is shown in the following table:

types	C_i	L_i	type 1			type 2			type 3			type 4		
			maximum permissible ambient temperature in °C for use in temperature class											
	[nF]	[µH]	T6	T5	T4-T1	T6	T5	T4-T1	T6	T5	T4-T1	T6	T5	T4-T1
NCB1,5...M...N0...	90	100	57	69	97	52	64	92	34	46	74	22	34	62
NCB2-12GM...-N0...	90	100	59	71	99	56	68	96	45	57	81	37	49	63
NCN4-12GM...-N0...	95	100	59	71	99	56	68	96	45	57	81	37	49	63
NCB5-18GM...-N0...	95	100	59	71	99	56	68	96	45	57	81	37	49	63
NCN8-18GM...-N0...	95	100	59	71	99	56	68	96	45	57	81	37	49	63
NCB10-30GM..-N0...	105	100	59	71	99	56	68	96	45	57	81	37	49	63
NCN15-30GM...-N0...	110	100	59	71	99	56	68	96	45	57	81	37	49	63
NJ 0,8-5GM-N...	30	50	56	68	96	51	63	91	32	44	67	19	31	41
NJ 1,5-6,5...-N...	30	50	56	68	96	51	63	91	32	44	67	19	31	41
NJ 1,5-10GM-N-Y...	30	50	56	68	96	51	63	91	32	44	67	19	31	41
NJ 2-11-N...	45	50	55	67	95	49	61	89	28	40	68	13	25	53
NJ 2-11-N-G...	30	50	59	71	99	56	68	96	45	57	81	37	49	63
NJ 2-12GM-N...	30	50	59	71	99	56	68	96	45	57	81	37	49	63
NJ 4-12GM-N...	45	50	56	68	96	51	63	91	32	44	67	19	31	41
NJ 5-18GM-N...	70	50	59	71	99	56	68	96	45	57	81	37	49	63
NJ 8-18GM-N...	70	50	59	71	99	56	68	96	45	57	81	37	49	63
NJ 10-30GM-N...	140	100	59	71	99	56	68	96	45	57	81	37	49	63
NJ 15-30GM-N...	140	100	59	71	99	56	68	96	45	57	81	37	49	63

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1. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 00 ATEX 2048 X

Test report: PTB Ex 02-22170

Zertifizierungsstelle Explosionsschutz
By order:

Braunschweig, August 08, 2002

Dr.-Ing. U. Johannsmeyer
Regierungsdirektor

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

2. SUPPLEMENT

according to Directive 94/9/EC Annex III.6

to EC-TYPE-EXAMINATION CERTIFICATE PTB 00 ATEX 2048 X

(Translation)

Equipment: Cylindrical inductive sensors, types NC... and NJ...

Marking: ⟨Ex⟩ **II 1 G EEx ia IIC T6**

Manufacturer: Pepperl + Fuchs GmbH

Address: Königsberger Allee 87
68307 Mannheim; Germany

Description of supplements and modifications

The cylindrical inductive sensors of type series NC... and NJ... may in future also be manufactured and operated according to the test documents listed in the test report PTB Ex 04-23445.

The modifications concern the extension of the type series NJ (new types and further types for application as category-1-apparatus), the depiction of the basic construction of the cylindrical inductive sensor, type NJ 4-30GM-N-200... with separate enclosures for oscillator and amplifier, the internal construction (further examples of circuit diagrams, new types of LED´s), the extension of point 4 of the "Special conditions" for type NJ 15-30GM-N... as well as further alternatives for fixing the marking.

The EC-type examination certificate is extended for the following types of cylindrical inductive sensors:

NJ 5-18GK-N-150...
NJ 8-18GK-N-150...
NJ 15-30GK-N-150...

The application conditions as category-1-apparatus are newly determined by this 2nd supplement for the following types of cylindrical inductive sensors:

NJ 1,5-10GM-N-Y...
NJ 1,5-8GM-N...
NJ 1,5-18GM-N-D...
NJ 4-30GM-N-200...
NJ 5-18GK-N...
NJ 5-18GK-N-150...
NJ 8-18GK-N...
NJ 8-18GK-N-150...
NJ 15-30GK-N...
NJ 15-30GK-N-150...

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2. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 00 ATEX 2048 X

For a better comprehensibility the "Electrical data" as well the tables showing the relationship between maximum permissible ambient temperatures, temperature classes, electrical data as well as equipment categories for all types of cylindrical inductive sensors are tabulated below:

Furthermore the altered "Special conditions" are listed.

Electrical data

Evaluation and supply circuit..... type of protection Intrinsic Safety EEx ia IIC/IIB
resp. EEx ib IIC/IIB
for connection to certified intrinsically safe circuits only
Maximum values:

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

With the application as category-1-apparatus it is to be considered that the evaluation and supply circuit has to comply with type of protection Intrinsic Safety EEx ia IIC/IIB.

For relationship between type of connected circuit, maximum permissible ambient temperature for use as category-1-apparatus resp. as category-2-apparatus and temperature class as well as the effective internal reactances for the individual types of cylindrical inductive sensors reference is made to the following tables:

2. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 00 ATEX 2048 X

Table 1: Application as category-1-apparatus

type	Ci/ nF	Li/ µH	type 1 T6	T5	T4	T3	T2-T1	type 2 T6	T5	T4	T3	T2-T1	type 3 T6	T5	T4	T3	T2-T1	type 4 T6	T5	T4	T3	T2-T1
NCB1,5-...M...N0...	90	100	57	69	97	97	97	52	64	92	92	92	34	46	74	74	74	22	34	62	62	62
NCB2-12GM...-N0...	90	100	59	71	99	99	99	56	68	96	96	96	45	57	81	81	81	37	49	63	63	63
NCN4-12GM...-N0...	95	100	59	71	99	99	99	56	68	96	96	96	45	57	81	81	81	37	49	63	63	63
NCB5-18GM...-N0...	95	100	59	71	99	99	99	56	68	96	96	96	45	57	81	81	81	37	49	63	63	63
NCN8-18GM...-N0...	95	100	59	71	99	99	99	56	68	96	96	96	45	57	81	81	81	37	49	63	63	63
NCB10-30GM...-N0...	105	100	59	71	99	99	99	56	68	96	96	96	45	57	81	81	81	37	49	63	63	63
NCN15-30GM...-N0...	110	100	59	71	99	99	99	56	68	96	96	96	45	57	81	81	81	37	49	63	63	63
NJ 0,8-5GM-N...	30	50	56	68	96	96	96	51	63	91	91	91	32	44	67	67	67	19	31	41	41	41
NJ 1,5-6,5...-N...	30	50	56	68	96	96	96	51	63	91	91	91	32	44	67	67	67	19	31	41	41	41
NJ 1,5-8GM-N...	30	50	56	68	96	96	96	51	63	91	91	91	32	44	67	67	67	19	31	41	41	41
NJ 1,5-10GM-N-Y....	20	50	56	68	96	96	96	51	63	91	91	91	32	44	67	67	67	19	31	41	41	41
NJ 1,5-18GM-N-D....	50	60	59	71	99	99	99	56	68	96	96	96	45	57	81	81	81	37	49	63	63	63
NJ 2-11-N...	45	50	55	67	95	95	95	49	61	89	89	89	28	40	68	68	68	13	25	53	53	53
NJ 2-11-N-G...	30	50	59	71	99	99	99	56	68	96	96	96	45	57	81	81	81	37	49	63	63	63
NJ 2-12GM-N...	30	50	59	71	99	99	99	56	68	96	96	96	45	57	81	81	81	37	49	63	63	63
NJ 4-30GM-N-200... (oscillator)	70	100	56	68	96	148	192	49	61	89	141	186	28	40	68	120	164	13	25	53	105	149
NJ 4-30GM-N-200... (amplifier)			56	68	96	96	96	49	61	89	89	89	28	40	68	68	68	13	25	53	53	53
NJ 4-12GM-N...	45	50	56	68	96	96	96	51	63	91	91	91	32	44	67	67	67	19	31	41	41	41
NJ 5-18GM-N...	70	50	59	71	99	99	99	56	68	96	96	96	45	57	81	81	81	37	49	63	63	63
NJ 5-18GK-N...	70	50	57	69	97	97	97	52	64	92	92	92	34	46	74	74	74	22	34	61	61	61
NJ 5-18GK-N-150...	70	50	57	69	97	149	150	52	64	92	144	150	34	46	74	126	150	22	34	61	114	136
NJ 8-18GK-N...	70	50	57	69	97	97	97	52	64	92	92	92	34	46	74	74	74	22	34	61	61	61
NJ 8-18GK-N-150...	70	50	57	69	97	149	150	52	64	92	144	150	34	46	74	126	150	22	34	61	114	136
NJ 8-18GM-N...	70	50	59	71	99	99	99	56	68	96	96	96	45	57	81	81	81	37	49	63	63	63
NJ 10-30GM-N...	140	100	59	71	99	99	99	56	68	96	96	96	45	57	81	81	81	37	49	63	63	63
NJ 15-30GK-N...	140	100	57	69	97	97	97	52	64	92	92	92	34	46	74	74	74	22	34	61	61	61
NJ 15-30GK-N-150...	140	100	57	69	97	149	150	52	64	92	144	150	34	46	74	126	150	22	34	61	114	136
NJ 15-30GM-N....	140	100	59	71	99	99	99	56	68	96	96	96	45	57	81	81	81	37	49	63	63	63

2. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 00 ATEX 2048 X

Table 2: Application as category-2-apparatus

type	Ci/ nF	Li/ µH	type 1 T6	type 1 T5	type 1 T4	type 1 T3	type 1 T2-T1	type 2 T6	type 2 T5	type 2 T4	type 2 T3	type 2 T2-T1	type 3 T6	type 3 T5	type 3 T4	type 3 T3	type 3 T2-T1	type 4 T6	type 4 T5	type 4 T4	type 4 T3	type 4 T2-T1
NCB1,5...M...N0...	90	100	74	89	100	100	100	69	84	100	100	100	51	66	85	85	85	39	54	67	67	67
NCB2-12GK...-N0...	90	100	73	88	100	100	100	69	84	100	100	100	51	66	80	80	80	39	54	61	61	61
NCB2-12GM...-N0...	90	100	76	91	100	100	100	73	88	100	100	100	62	77	81	81	81	54	63	63	63	63
NCN4-12GK...-N0...	95	100	73	88	100	100	100	69	84	100	100	100	51	66	80	80	80	39	54	61	61	61
NCN4-12GM...-N0...	95	100	76	91	100	100	100	73	88	100	100	100	62	77	81	81	81	54	63	63	63	63
NCB5-18GK...-N0...	95	100	73	88	100	100	100	69	84	100	100	100	51	66	80	80	80	39	54	61	61	61
NCB5-18GM...-N0...	95	100	76	91	100	100	100	73	88	100	100	100	62	77	81	81	81	54	63	63	63	63
NCN8-18GK...-N0...	95	100	73	88	100	100	100	69	84	100	100	100	51	66	80	80	80	39	54	61	61	61
NCN8-18GM...-N0...	95	100	76	91	100	100	100	73	88	100	100	100	62	77	81	81	81	54	63	63	63	63
NCB10-30GK...-N0...	105	100	73	88	100	100	100	69	84	100	100	100	51	66	80	80	80	39	54	61	61	61
NCB10-30GM...-N0...	105	100	76	91	100	100	100	73	88	100	100	100	62	77	81	81	81	54	63	63	63	63
NCN15-30GK...-N0...	110	100	73	88	100	100	100	69	84	100	100	100	51	66	80	80	80	39	54	61	61	61
NCN15-30GM...-N0...	110	100	76	91	100	100	100	73	88	100	100	100	62	77	81	81	81	54	63	63	63	63
NJ 0,2-10GM-N...	20	50	73	88	100	100	100	68	83	100	100	100	49	64	67	67	67	36	42	42	42	42
NJ 0,8-4,5-N...	30	50	73	88	100	100	100	68	83	100	100	100	49	64	67	67	67	36	42	42	42	42
NJ 0,8-5GM-N...	30	50	73	88	100	100	100	68	83	100	100	100	49	64	67	67	67	36	42	42	42	42
NJ 1,5-6,5...-N...	30	50	73	88	100	100	100	68	83	100	100	100	49	64	67	67	67	36	42	42	42	42
NJ 1,5-10GM-N-Y...	20	50	73	88	100	100	100	68	83	100	100	100	49	64	67	67	67	36	42	42	42	42
NJ 1,5-8GM-N...	30	50	73	88	100	100	100	68	83	100	100	100	49	64	67	67	67	36	42	42	42	42
NJ 1,5-8-N...	20	50	73	88	100	100	100	68	83	100	100	100	49	64	67	67	67	36	42	42	42	42
NJ 1,5-18GM-N-D...	50	60	76	91	100	100	100	73	88	100	100	100	62	77	81	81	81	54	63	63	63	63
NJ 2-11-N...	45	50	73	88	100	100	100	66	81	100	100	100	45	60	89	89	89	30	45	74	74	74
NJ 2-11-N-G...	30	50	76	91	100	100	100	73	88	100	100	100	62	77	81	81	81	54	63	63	63	63
NJ 2-12GK-N...	45	50	73	88	100	100	100	69	84	100	100	100	51	66	80	80	80	39	54	61	61	61
NJ 2-12GM-N...	30	50	76	91	100	100	100	73	88	100	100	100	62	77	81	81	81	54	63	63	63	63
NJ 2-14GM-N...	30	50	76	91	100	100	100	73	88	100	100	100	62	77	81	81	81	54	63	63	63	63
NJ 2,5-14GM-N...	30	50	76	91	100	100	100	73	88	100	100	100	62	77	81	81	81	54	63	63	63	63
NJ 4-12GK-N...	45	50	73	88	100	100	100	69	84	100	100	100	51	66	80	80	80	39	54	61	61	61
NJ 4-14GK-N...	45	50	73	88	100	100	100	69	84	100	100	100	51	66	80	80	80	39	54	61	61	61
NJ 4-12GM-N...	45	50	73	88	100	100	100	68	83	100	100	100	49	64	67	67	67	36	42	42	42	42

Continuation Table 2: Application as category-2-apparatus

type	Ci/	Li/	type 1					type 2					type 3					type 4				
			T6	T5	T4	T3	T2-T1	T6	T5	T4	T3	T2-T1	T6	T5	T4	T3	T2-T1	T6	T5	T4	T3	T2-T1
NJ 4-30GM-N-200... (oscillator)	70	100	73	88	123	188	192	66	81	116	181	186	45	60	95	160	164	30	45	80	145	149
NJ 4-30GM-N-200... (amplifier)			73	88	100	100	100	66	81	100	100	100	45	60	89	89	89	30	45	74	74	74
NJ 5-10-11-N...	70	100	73	88	100	100	100	66	81	100	100	100	45	60	78	78	78	30	45	57	57	57
NJ 5-11-N...	45	50	72	87	100	100	100	65	80	100	100	100	42	57	82	82	82	26	41	63	63	63
NJ 5-18GK-N...	70	50	73	88	100	100	100	69	84	100	100	100	51	66	80	80	80	39	54	61	61	61
NJ 5-18GK-N-150...	70	50	73	88	124	150	150	69	84	119	150	150	51	66	101	150	150	39	54	89	136	136
NJ 5-18GM-N...	70	50	76	91	100	100	100	73	88	100	100	100	62	77	81	81	81	54	63	63	63	63
NJ 6-22-N...	130	100	73	88	100	100	100	69	84	100	100	100	51	66	80	80	80	39	54	61	61	61
NJ 8-18GK-N...	70	50	73	88	100	100	100	69	84	100	100	100	51	66	80	80	80	39	54	61	61	61
NJ 8-18GK-N-150...	70	50	73	88	124	150	150	69	84	119	150	150	51	66	101	150	150	39	54	89	136	136
NJ 8-18GM-N...	70	50	76	91	100	100	100	73	88	100	100	100	62	77	81	81	81	54	63	63	63	63
NJ 10-22-N...	130	100	73	88	100	100	100	69	84	100	100	100	51	66	80	80	80	39	54	61	61	61
NJ 10-30GK...-N...	140	100	73	88	100	100	100	69	84	100	100	100	51	66	80	80	80	39	54	61	61	61
NJ 10-30GM-N...	140	100	76	91	100	100	100	73	88	100	100	100	62	77	81	81	81	54	63	63	63	63
NJ 15-30GK...-N...	140	100	73	88	100	100	100	69	84	100	100	100	51	66	80	80	80	39	54	61	61	61
NJ 15-30GK-N-150...	140	100	73	88	124	150	150	69	84	119	150	150	51	66	101	150	150	39	54	89	136	136
NJ 15-30GM-N...	140	100	76	91	100	100	100	73	88	100	100	100	62	77	81	81	81	54	63	63	63	63
NJ 25-50-N...	150	140	73	88	100	100	100	69	84	100	100	100	51	66	80	80	80	39	54	61	61	61
NJ 20-40-N...	140	140	73	88	100	100	100	69	84	100	100	100	51	66	80	80	80	39	54	61	61	61

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

2. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 00 ATEX 2048 X

Special conditions

1. When the cylindrical inductive sensors , types NC... and NJ... are used in a temperature range between -60°C and -20 °C, they shall be protected against impact stress by installation into an additional housing.
2. The connection facilities of the cylindrical inductive sensors , types NC... and NJ... shall be installed as such that the degree of protection IP 20 according to IEC-Publikation 60529:1989 is met as a minimum.
3. For relationship between type of connected circuit, maximum permissible ambient temperature and temperature class as well as the effective internal reactances for the individual types of cylindrical inductive sensors reference is made to tables 1 & 2 of this 2nd supplement to EC-type certificate PTB 00 ATEX 2048 X.
4. Inadmissible electrostatic charge of parts of the metal housing shall be avoided with the following types of cylindrical inductive sensors. Dangerous electrostatic charge of parts of the metal housing can be avoided by grounding these parts. Very small parts of the metal housing (e.g. screws) do not need to be grounded.

NCB1,5...M...N0...
NCB2-12GM...-N0...
NCN4-12GM...-N0...
NCB5-18GM...-N0...
NCN8-18GM...-N0...
NCB10-30GM..-N0...
NCN15-30GM...-N0...
NJ 0,2-10GM-N...
NJ 0,8-4,5-N...
NJ 0,8-5GM-N...
NJ 1,5-6,5...-N...
NJ 1,5-10GM-N-Y...
NJ 1,5-8GM-N...
NJ 1,5-8-N...
NJ 1,5-18GM-N-D...
NJ 2-11-N-G...
NJ 2-12GM-N...
NJ 2-14GM-N...
NJ 2,5-14GM-N...
NJ 4-12GM-N...
NJ 4-30GM-N-200...
NJ 5-11-N-545...
NJ 5-11-N-G...
NJ 5-18GM-N...
NJ 6-22-N-G...
NJ 8-18GM-N...
NJ 10-22-N-G...
NJ 10-30GM-N...
NJ 15-30GM-N...

Test report: PTB Ex 04-23445

Zertifizierungsstelle Explosionsschutz
By order:

Dr.-Ing. U. Gerlach
Regierungsrat

Braunschweig, July 12, 2004

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

3. SUPPLEMENT

according to Directive 94/9/EC Annex III.6

to EC-TYPE-EXAMINATION CERTIFICATE PTB 00 ATEX 2048 X

(Translation)

Equipment: Cylindrical inductive sensors, types NC... and NJ...

Marking:  **II 1 G EEx ia IIC T6**

Manufacturer: Pepperl + Fuchs GmbH

Address: Königsberger Allee 87, 68307 Mannheim, Germany

Description of supplements and modifications

In the future the cylindrical inductive sensors of type series NC... and NJ... may also be manufactured and operated according to the test documents listed in the test report PTB Ex 05-25204.

The modifications concern the extension of the type series NC... (new types for application as category-1-apparatus or as category-2-apparatus respectively), the internal construction (further examples of circuit diagrams, new types of LED´s and cast resin) as well as the extension of clause 4 of the "Special Conditions" for the new types of type series NC... .

The EC-type examination certificate is extended for the following types of cylindrical inductive sensors:

NCB4-12GM...-N0...
NCB8-18GM...-N0...
NCB15-30GM...-N0...

The "Electrical Data" listed below apply for these types.

All other specifications apply also for this 3rd supplement without changes.

3. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 00 ATEX 2048 X

Electrical data

Evaluation and supply circuit..... type of protection Intrinsic Safety EEx ia IIC/IIB
or EEx ib IIC/IIB
only for connection to certified intrinsically safe circuits
Maximum values:

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

With the application as category-1-apparatus it is to be considered that the evaluation and supply circuit has to comply with type of protection Intrinsic Safety EEx ia IIC/IIB.

For relationship between type of connected circuit, maximum permissible ambient temperature for use as category-1-apparatus resp. as category-2-apparatus and temperature class as well as the effective internal reactances for the individual types of cylindrical inductive sensors, reference is made to the following tables:

3. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 00 ATEX 2048 X

Table 1: Application as category 1-equipment

type	Ci/ nF	Li/ µH	type 1						type 2						type 3						type 4					
			T6	T5	T4	T3	T2-T1		T6	T5	T4	T3	T2-T1		T6	T5	T4	T3	T2-T1		T6	T5	T4	T3	T2-T1	
NCB4-12GM...-N0...	120	50	57	69	97	97	97		52	64	92	92	92		34	46	74	74	74		22	34	52	52	52	
NCB8-18GM...-N0...	120	50	57	69	97	97	97		52	64	92	92	92		34	46	74	74	74		22	34	52	52	52	
NCB15-30GM...-N0...	120	150	57	69	97	97	97		52	64	92	92	92		34	46	74	74	74		22	34	52	52	52	

Table 2: Application as category 2-equipment

type	Ci/ nF	Li/ µH	type 1						type 2						type 3						type 4					
			T6	T5	T4	T3	T2-T1		T6	T5	T4	T3	T2-T1		T6	T5	T4	T3	T2-T1		T6	T5	T4	T3	T2-T1	
NCB4-12GM...-N0...	120	50	74	89	100	100	100		69	84	100	100	100		51	66	74	74	74		39	52	52	52	52	
NCB8-18GM...-N0...	120	50	74	89	100	100	100		69	84	100	100	100		51	66	74	74	74		39	52	52	52	52	
NCB15-30GM...-N0...	120	150	74	89	100	100	100		69	84	100	100	100		51	66	74	74	74		39	52	52	52	52	

Physikalisch-Technische Bundesanstalt

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3. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 00 ATEX 2048 X

Special conditions

1. When the cylindrical inductive sensors , types NC... and NJ... are used in a temperature range between -60 °C and -20 °C, they shall be protected against impact stress by installation into an additional housing.
2. The connection facilities of the cylindrical inductive sensors , types NC... and NJ... shall be installed as such that the degree of protection IP 20 according to IEC-Publikation 60529:1989 is met as a minimum.
3. For relationship between type of connected circuit, maximum permissible ambient temperature and temperature class as well as the effective internal reactances for the individual types of cylindrical inductive sensors reference is made to tables 1 & 2 of the 2nd supplement and – for the new types – to tables 1 & 2 of this 3rd supplement to EC-type certificate PTB 00 ATEX 2048 X.
4. Inadmissible electrostatic charge of parts of the metal housing shall be avoided for the following types of cylindrical inductive sensors. Dangerous electrostatic charge of parts of the metal housing can be avoided by grounding these parts. Very small parts of the metal housing (e.g. screws) do not need to be grounded.

NCB1,5...M...N0...
NCB2-12GM...-N0...
NCB4-12GM...-N0...
NCB5-18GM...-N0...
NCB8-18GM...-N0...
NCB10-30GM..-N0...
NCB15-30GM...-N0...
NCN4-12GM...-N0...
NCN8-18GM...-N0...
NCN15-30GM...-N0...
NJ 0,2-10GM-N...
NJ 0,8-4,5-N...
NJ 0,8-5GM-N...
NJ 1,5-6,5...-N...
NJ 1,5-10GM-N-Y...
NJ 1,5-8GM-N...
NJ 1,5-8-N...
NJ 1,5-18GM-N-D...
NJ 2-11-N-G...
NJ 2-12GM-N...
NJ 2-14GM-N...
NJ 2,5-14GM-N...
NJ 4-12GM-N...
NJ 4-30GM-N-200...
NJ 5-11-N-545...
NJ 5-11-N-G...
NJ 5-18GM-N...
NJ 6-22-N-G...
NJ 8-18GM-N...
NJ 10-22-N-G...
NJ 10-30GM-N...
NJ 15-30GM-N...

Test report: PTB Ex 05-25204

Zertifizierungsstelle Explosionsschutz
By order:

Dr.-Ing. U. Johannsmeyer
Direktor und Professor

Braunschweig, October 7, 2005

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

4. SUPPLEMENT

according to Directive 94/9/EC Annex III.6

to EC-TYPE-EXAMINATION CERTIFICATE PTB 00 ATEX 2048 X

(Translation)

Equipment: Cylindrical inductive sensors, types NC... and NJ...

Marking: ⟨Ex⟩ **II 1 G EEx ia IIC T6**

Manufacturer: Pepperl + Fuchs GmbH

Address: Lilienthalstraße 200
68307 Mannheim, Germany

Description of supplements and modifications

In the future the cylindrical inductive sensors of types NC... and NJ... may also be manufactured and operated according to the test documents listed in the assessment and test report.
The modifications concern the application of an alternative casting compound and a different enclosure material as well as additional types of LEDs. Furthermore the test specification is adapted to the current state of the standards which causes an alteration of the marking.

The marking will read in future: ⟨Ex⟩ **II 1 G Ex ia IIC T6**

The "Special Conditions" and all further specifications of the EC-type examination certificate including supplements Nos. 1 through 3 apply without changes also to this 4th supplement.

Applied standards

EN 60079-0:2006 **EN 60079-11:2007** **EN 60079-26:2007**

Assessment and test report: PTB Ex 11-20105

Zertifizierungssektor Explosionsschutz
On behalf of PTB:

Braunschweig, May 2, 2011

Dr.-Ing. U. Johannsmeyer
Direktor und Professor

PHYSIKALISCH-TECHNISCHE BUNDESANSTALT 24

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