



BUREAU
VERITAS



EU - Type Examination Certificate

(1)

(2) Equipment and protective systems intended for use in potentially explosive atmospheres – Directive 2014/34/EU

(3) EU - Type Examination Certificate Number

EPS 14 ATEX 1 764 X

Revision 5

(4) Equipment: Valve position monitor / Limit switch box: APL-5aab

(5) Manufacturer: HKC Co., Ltd.

(6) Address: 203, Gangchon-ro, Danwon-gu, Ansan-si,
Gyeonggi-do, Republic of Korea

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

(8) Bureau Veritas Consumer Products Services Germany GmbH, notified body No. 2004 in accordance with Article 21 given in the Directive 2014/34/EU of the European Parliament and of the Council of 26 February 2014, 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 of the Directive. The examination and test results are recorded in the confidential documentation under the reference number 14TH0242.

(9) Compliance with the essential health and safety requirements has been assured by compliance with:

EN IEC 60079-0:2018

EN 60079-1:2014

EN 60079-11:2012

EN 60079-31:2014

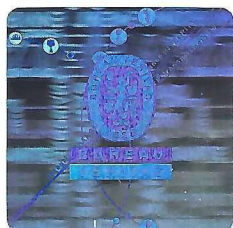
(10) If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the annex to this certificate.

(11) This EU - Type Examination Certificate relates only to the design and construction of the specified equipment in accordance with Directive 2014/34/EU. Further requirements of this Directive apply to the manufacture of this equipment and its placing on the market. Those requirements are not covered by this certificate.

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

II 2G Ex db IIC T6 Gb
II 2G Ex ia IIC T6 Gb
II 2D Ex tb IIIC T85°C Db IP67
II 2D Ex ia IIIC T85°C Db

(additional information see page 2)



Certification department of explosion protection

Ulrich Feike

Tuerkheim, 2023-06-13

Certificates without signature and seal are void. This certificate is allowed to be distributed only if not modified. Extracts or modifications must be authorized by Bureau Veritas Consumer Products Services Germany GmbH.

Annex

(13)

(14) **EU - Type Examination Certificate EPS 14 ATEX 1 764 X**

Revision 5

(15) Description of equipment:

The series APL-5... Limit Switch Box is an equipment which monitors the present position of a valve by contacting micro switches inside an Ex-d enclosure. The enclosure is rated IP66/67. The interior of the enclosure is fitted with up to four switches rated at up to 16A, 250Vac with associated switch assembly and terminal block.

For APL-510b/511b/512b/513b/514b/515b/520b and APL-5H1b/5H2b/5H3b/5H4b/5H5b/5H6b:

Above models are designed to comply simultaneously with type of protection "i", "d" and "t" and may be installed according to the selection of the user. For type of protection "ia" a certified inductive sensor (APL-520b) is used (Pepperl+Fuchs; NJ2-V3-N). APL-515b is provided with a potentiometer input (type of protection "ia"). See electrical values below.

Intrinsic safety:

The intrinsically safe parameters of the inductive sensor NJ2-V3-N rely on the application of the device. For model APL-520b with marking II 2G Ex ia IIC T6 Gb with +60 °C ambient the following restrictions apply:

Ui = 16 V
Ii = 25 mA
Pi = 64 mW
Ci = 40 nF
Li = 50 µH

Refer to the manual of NJ2-V3-N by Pepperl+Fuchs for additional information; and IECEx CoC Ref No. IECEx PTB 11.0021X, dated 2021-06-23 (Issue 2).

For model APL-515b with marking

II 2G Ex ia IIC T6 Gb

II 2D Ex ia IIC T85°C Db with 60 °C ambient the following restrictions apply:

Ui = 28 V
Ii = 93 mA
Pi = 651 mW
Ci = 0 nF
Li = 0 µH

APL-5aab

aa = 10, 11, 12, 13, 14, 15, 16, 20, 21, 22, 23, 25, 26, 30A, 30B, 31, 32, 34, 35, 36, H1, H2, H3, H4, H5, H6

b = N, S

aa - stands for the switch type (mechanical, proximity, reed)

b - stands for the enclosure material (aluminium, stainless steel)

Ambient temperature:

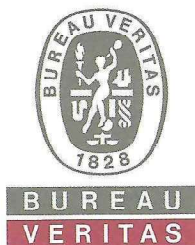
max. -60 °C to +60 °C for type of protection "db"

max. -50 °C to +60 °C for type of protection "tb" / "ia"

Electrical data:

Depends on configuration

(16) Reference number: 14TH0242



EU - Type Examination Certificate EPS 14 ATEX 1 764 X

Revision 5

(17) Special conditions for safe use:

Cable entry holes are provided as specified on the certified drawings for the fitting of suitable certified flameproof cable entry devices. Unused entries are to be fitted with suitable certified flameproof blanking plugs.

For use with proximity sensor NJ2-V3-N the following additional condition applies:

The equipment shall only be connected to certified intrinsically safe evaluation and supply circuit with type of protection Ex [ia] IIC.

Risk of electrostatic charges; the installation is intended to minimize the risk from electrostatic discharge.

(18) Essential health and safety requirements:

Met by compliance with standards.



Certification department of explosion protection

Tuerkheim, 2023-06-13



(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 2032 X



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

(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 00-29269.

(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:



II 2 G EEx ia IIC T6

Zertifizierungsstelle Explosionsschutz
By order:

Braunschweig, June 30, 2000

Dr.-Ing. U. Johannsmeyer
Regierungsdirektor



(13)

SCHEDULE

(14)

EC-TYPE-EXAMINATION CERTIFICATE PTB 00 ATEX 2032 X

(15) Description of equipment

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

The cuboidal 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 cuboidal 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
$U_i = 16 \text{ V}$	$U_i = 16 \text{ V}$	$U_i = 16 \text{ V}$	$U_i = 16 \text{ V}$
$I_i = 25 \text{ mA}$	$I_i = 25 \text{ mA}$	$I_i = 52 \text{ mA}$	$I_i = 76 \text{ mA}$
$P_i = 34 \text{ mW}$	$P_i = 64 \text{ mW}$	$P_i = 169 \text{ mW}$	$P_i = 242 \text{ mW}$

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 cuboidal inductive sensors is shown in the following table:

			type 1			type 2			type 3			type 4		
types	C _i	L _i	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
FJ 6-110-N...	150	110	73	88	100	73	88	100	62	77	81	54	63	63
FJ 7-N...	65	220	73	88	100	73	88	100	62	77	81	54	63	63
NCB2-F1-N0...	90	100	73	88	100	66	81	100	45	60	89	30	45	74
NCB2-V3-N0...	100	100	73	88	100	66	81	100	45	60	89	30	45	74
NCN4-V3-N0...	100	100	73	88	100	66	81	100	45	60	89	30	45	74
NCB15+U...+N0...	110	160	73	88	100	66	81	100	45	60	89	30	45	74
NCB40-FP-N0...	220	360	73	88	100	66	81	100	45	60	89	30	45	74
NCN15-M...-N0...	100	100	73	88	100	66	81	100	45	60	89	30	45	74
NCN20+U...+N0...	110	160	73	88	100	66	81	100	45	60	89	30	45	74
NCN30+U...+N0...	110	160	73	88	100	66	81	100	45	60	89	30	45	74
NCN40+U...+N0...	120	130	73	88	100	66	81	100	45	60	89	30	45	74
NCN50-FP-N0...	220	360	73	88	100	66	81	100	45	60	89	30	45	74
NJ 0,8-F-N...	30	50	73	88	100	67	82	100	45	60	78	30	45	57
NJ 1,5-F-N...	30	50	73	88	100	67	82	100	45	60	78	30	45	57
NJ 2,5-F-N...	40	50	73	88	100	66	81	100	45	60	89	30	45	74
NJ 2-F1-N...	30	50	73	88	100	66	81	100	45	60	89	30	45	74
NJ 2-V3-N...	40	50	73	88	100	66	81	100	45	60	89	30	45	74
NJ 4-F-N...	150	100	73	88	100	66	81	100	45	60	89	30	45	74
NJ 6-F-N...	70	100	73	88	100	66	81	100	45	60	89	30	45	74
NJ 10-F-N...	85	100	73	88	100	66	81	100	45	60	89	30	45	74
NJ 15+U.+N...	140	130	73	88	100	66	81	100	45	60	89	30	45	74
NJ 15-M1.-N...	140	100	73	88	100	66	81	100	45	60	89	30	45	74
NJ 20+U.+N...	150	130	73	88	100	66	81	100	45	60	89	30	45	74
NJ 30+U.+N...	160	130	73	88	100	66	81	100	45	60	89	30	45	74
NJ 30P+U.+1N...	150	170	73	88	100	66	81	100	45	60	89	30	45	74
NJ 40+...+N...	180	130	73	88	100	66	81	100	45	60	89	30	45	74
NJ 50-FP-N...	320	360	73	88	100	66	81	100	45	60	89	30	45	74

(16) Test report PTB Ex 00-29269

(17) Special conditions for safe use

1. For the application within a temperature range of -60 °C to -20 °C the cuboidal inductive sensors, types FJ..., NJ... and NC... must be protected against damage due to impact by mounting into an additional housing.
2. The connection facilities of the cuboidal inductive sensors, types FJ..., NJ... and NC... 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 cuboidal inductive sensors is shown in the table given under item (15) of this EC-type-examination certificate.
4. With the application in group IIC inadmissible electrostatic charge of the plastic housing has to be avoided for following types of cuboidal inductive sensors (warning label on the device):

NCB40-FP-N0...	NJ 30P+U...+1N...
NCN40+U...+N0...	NJ 40+U...+N...
NCN50-FP-N0...	NJ 50-FP-N...

5. Inadmissible electrostatic charge of parts of the metal housing has to be avoided for the following types of cuboidal 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:

FJ 6-110-N...	NCN30+U4+N0...	NJ 20+U4+N...
FJ 7-N...	NCN40+U3+N0...	NJ 30+U3+N...
NCB15+U3+N0...	NCN40+U4+N0...	NJ 30+U4+N...
NCB15+U4+N0...	NCN50-FP-N0-P3...	NJ 30P+U3+1N...
NCB40-FP-N0-P3...	NCN50-FP-N0-P4...	NJ 30P+U4+1N...
NCB40-FP-N0-P4...	NJ 15+U3+N...	NJ 40+U3+N...
NCN20+U3+N0...	NJ 15+U4+N...	NJ 40+U4+N...
NCN20+U4+N0...	NJ 15-M1-N-V	NJ 50-FP-N-P3...
NCN30+U3+N0...	NJ 20+U3+N...	NJ 50-FP-N-P4...

(18) Essential health and safety requirements

Met by the standards mentioned above

Zertifizierungsstelle Explosionsschutz
By order:

Dr.-Ing. U. Johannsmeyer
Regierungsdirektor



Braunschweig, June 30, 2000

sheet 4/4

1. SUPPLEMENT

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

to EC-TYPE-EXAMINATION CERTIFICATE PTB 00 ATEX 2032 X

(Translation)

Equipment: Cuboidal inductive sensors, types FJ..., NJ... and NC...

Marking:  II 2 G EEx ia IIC T6

Manufacturer: Pepperl + Fuchs GmbH

Address: 68307 Mannheim, Deutschland

Description of supplements and modifications

The existing EC-type examination certificate for the cuboidal inductive sensors of types FJ..., NJ... and NC... will be extended for the types NCN2-F56-N1... and NBN4-V3-N0... corresponding to supplementary test documents listed in the test report. The "Electrical data" listed below are valid for these types.

Furthermore the cuboidal inductive sensors of types FJ..., NJ... and NC... may in future also be manufactured according to the supplementary test documents of the test report. The modifications concern the the internal construction, the extension of possible types of casting resin, the way of marking with type plates as well as the type code of sensors with bottom parts.

The type code of these sensors may be supplemented with additional marks (e.g. U3., U4., P3., P4.).

The "Special Conditions", particularly item 4 and 5 are anlogously valid for types with changed type code.

All other details are also valid for this 1st. supplement without changes.

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

1. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 00 ATEX 2032 X

Maximum values:

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

The correlation between type of connected circuit, maximum permissible ambient temperature and temperature class as well as the effective internal reactances for the new types of cuboidal inductive sensors is to be taken from the table:

			type 1			type 2			type 3			type 4		
types	C _i [nF]	L _i [μH]	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
NCN2-F56-N1...	100	100	75	90	100	70	85	100	55	70	87	-	-	-
NBN4-V3-N0...	100	100	73	88	100	66	81	100	45	60	89	30	45	74

Test report: PTB Ex 01-20124

Zertifizierungsstelle Explosionsschutz
By order:

Braunschweig, 2001-08-23

Dr.-Ing. U. Johannsmeyer
Regierungsdirektor



2. SUPPLEMENT

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

to EC-TYPE-EXAMINATION CERTIFICATE PTB 00 ATEX 2032 X

(Translation)

Equipment: cubical inductive sensors, types FJ..., NJ... and NC...

Marking:  II 2 G EEx ia IIC T6

Manufacturer: Pepperl + Fuchs GmbH

Address: Königsberger Allee 87
68307 Mannheim; Germany

Description of supplements and modifications

The cubical inductive sensors of type series NJ... and NC... , 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 cubical inductive sensors.

NCB2-F1-N0...	NCN20+U...+N0...	NJ 20+U.+N...
NCB2-V3-N0...	NCN30+U...+N0...	NJ 30+U.+N...
NCN4-V3-N0...	NCN40+U...+N0...	NJ 40+...+N...
NCB15+U...+N0...	NCN50-FP-N0...	NJ 50-FP-N...
NCB40-FP-N0...	NJ 2-V3-N...	
NCN15-M...-N0...	NJ 15+U.+N...	

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

 II 1 G EEx ia IIC T6

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

2. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 00 ATEX 2032 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
$U_i = 16 \text{ V}$	$U_i = 16 \text{ V}$	$U_i = 16 \text{ V}$	$U_i = 16 \text{ V}$
$I_i = 25 \text{ mA}$	$I_i = 25 \text{ mA}$	$I_i = 52 \text{ mA}$	$I_i = 76 \text{ mA}$
$P_i = 34 \text{ mW}$	$P_i = 64 \text{ mW}$	$P_i = 169 \text{ mW}$	$P_i = 242 \text{ mW}$

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 cubical inductive sensors is shown in the following table:

types	C _i [nF]	L _i [μH]	type 1			type 2			type 3			type 4		
			maximum permissible ambient temperature in °C for use in temperature class											
			T6	T5	T4- T1	T6	T5	T4- T1	T6	T5	T4- T1	T6	T5	T4- T1
NCB2-F1-N0...	90	100	56	68	96	49	61	89	28	40	68	13	25	53
NCB2-V3-N0...	100	100	56	68	96	49	61	89	28	40	68	13	25	53
NCN4-V3-N0...	100	100	56	68	96	49	61	89	28	40	68	13	25	53
NCB15+U...+N0...	110	160	56	68	96	49	61	89	28	40	68	13	25	53
NCB40-FP-N0...	220	360	56	68	96	49	61	89	28	40	68	13	25	53
NCN15-M...-N0...	100	100	56	68	96	49	61	89	28	40	68	13	25	53
NCN20+U...+N0...	110	160	56	68	96	49	61	89	28	40	68	13	25	53
NCN30+U...+N0...	110	160	56	68	96	49	61	89	28	40	68	13	25	53
NCN40+U...+N0...	120	130	56	68	96	49	61	89	28	40	68	13	25	53
NCN50-FP-N0...	220	360	56	68	96	49	61	89	28	40	68	13	25	53
NJ 2-V3-N...	40	50	56	68	96	49	61	89	28	40	68	13	25	53
NJ 15+U.+N...	140	130	56	68	96	49	61	89	28	40	68	13	25	53
NJ 20+U.+N...	150	130	56	68	96	49	61	89	28	40	68	13	25	53
NJ 30+U.+N...	160	130	56	68	96	49	61	89	28	40	68	13	25	53
NJ 40+...+N...	180	130	56	68	96	49	61	89	28	40	68	13	25	53
NJ 50-FP-N...	320	360	56	68	96	49	61	89	28	40	68	13	25	53

Test report: PTB Ex 03-22406

Zertifizierungsstelle Explosionsschutz
By order:

Braunschweig, April 04, 2003

Dr.-Ing. U. Johannsmeyer
Regierungsdirektor



3. SUPPLEMENT

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

to EC-TYPE-EXAMINATION CERTIFICATE PTB 00 ATEX 2032 X (Translation)

Equipment: Cuboidal inductive sensors, types FJ..., NJ... and NC...

Marking:  II 2 G EEx ia IIC T6

Manufacturer: Pepperl + Fuchs GmbH

Address: Königsberger Allee 87, 68307 Mannheim, Germany

Description of supplements and modifications

The EC-type examination certificate will be extended for the cuboidal inductive sensor, type NJ 3-V3-N... . The cuboidal inductive sensor, type NJ 3-V3-N... is exclusively intended for operation in hazardous areas where category-2 equipment is required.

Further modifications concern the marking, the internal construction as well as the operating instructions of the cuboidal inductive sensors. These modifications have no effect on the "Electrical data", the "Special conditions" and all further safety relevant specifications.

Electrical data

Evaluation and supply circuit

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

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

3. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 00 ATEX 2032 X

For relationship of the type of connected circuit, the maximum permissible ambient temperature for application as category-2 equipment, and the temperature class as well as the effective internal reactances for this type of cuboidal inductive sensor, reference is made to the following table:

			type 1			type 2			type 3			type 4		
type	C _i [nF]	L _i [μH]	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 3-V3-N...	40	50	73	88	100	66	81	100	45	60	89	30	45	74

Test report: PTB Ex 04-23369

Zertifizierungsstelle Explosionsschutz
By order:

Braunschweig, February 26, 2004

Dr.-Ing. U. Johannsmeyer
Regierungsdirektor



4. SUPPLEMENT

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

to EC-TYPE-EXAMINATION CERTIFICATE PTB 00 ATEX 2032 X

(Translation)

Equipment: Cuboidal inductive sensors, types FJ..., NJ... and NC...

Marking:  II 2 G EEx ia IIC T6 or

 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 cuboidal inductive sensors of types FJ..., NJ... and NC... may also be manufactured and operated according to the test documents listed in the test report PTB Ex 06-25344.

The modifications concern the extension of type series NC... (new variants), the introduction of type series NB... , the internal construction (further examples of the circuit diagram, new LED-types, new casting compound), the predefinition of the operating conditions for application as category-1 equipment, now relating to all cuboidal inductive sensors certified within the scope of this EC-type examination certificate as well as the adaption of the "Special Conditions".

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

NBN3-F69-N0...

NBN4-V3-N0-Y189289

NCN40-L2-N0...

NCB20-L2-N0...

4. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 00 ATEX 2032 X

The operating conditions for application as category-1 equipment are newly predefined with this 4. supplement for the following types of cuboidal inductive sensors.

FJ 6-110-N...	NJ 1,5-F-N...
FJ 7-N...	NJ 2-F1-N...
NCN2-F56-N1...	NJ 2,5-F-N...
NBN3-F69-N0...	NJ 3-V3-N...
NBN4-V3-N0...	NJ 4-F-N...
NBN4-V3-N0-Y189289	NJ 6-F-N...
NCN40-L2-N0...	NJ 10-F-N...
NCB20-L2-N0...	NJ 15-M1.-N...
NJ 0,8-F-N...	NJ 30P+U.+1N...

For improved comprehensibility the "electrical data" as well as the tables which form the relationship between maximum permissible ambient temperature, temperature classes, electrical data and equipment categories, are indicated for all types of cuboidal inductive sensors as follows.

Furthermore, the altered "Special Conditions" are specified.

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
$U_i = 16 \text{ V}$	$U_i = 16 \text{ V}$	$U_i = 16 \text{ V}$	$U_i = 16 \text{ V}$
$I_i = 25 \text{ mA}$	$I_i = 25 \text{ mA}$	$I_i = 52 \text{ mA}$	$I_i = 76 \text{ mA}$
$P_i = 34 \text{ mW}$	$P_i = 64 \text{ mW}$	$P_i = 169 \text{ mW}$	$P_i = 242 \text{ mW}$

For the application as category-1 equipment the evaluation and supply circuit must correspond to type of protection Intrinsic Safety EEx ia IIC/IIB.

The relationship between type of the connected circuit, maximum permissible ambient temperature for application as category-1 resp. category-2 equipment and temperature class as well as the effective internal reactances for the individual types of cuboidal inductive sensors, is shown in the following tables:

4. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 00 ATEX 2032 X

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
FJ 6-110-N...	150	110	59	71	99	56	68	96	45	57	81	37	49	63
FJ 7-N...	65	220	59	71	99	56	68	96	45	57	81	37	49	63
NCB2-F1-N0...	90	100	56	68	96	49	61	89	28	40	68	13	25	53
NCB2-V3-N0...	100	100	56	68	96	49	61	89	28	40	68	13	25	53
NCN2-F56-N1...	100	100	57	69	97	53	65	93	37	49	77	-	-	-
NBN3-F69-N0...	100	100	55	67	95	48	60	88	24	36	63	-	-	37
NBN4-V3-N0...	100	100	56	68	96	49	61	89	28	40	68	13	25	53
NBN4-V3-N0-Y189289	120	100	55	67	95	48	60	88	24	36	63	-	-	37
NCN4-V3-N0...	100	100	56	68	96	49	61	89	28	40	68	13	25	53
NCB15+U...+N0...	110	160	56	68	96	49	61	89	28	40	68	13	25	53
NCN15-M...-N0...	100	100	56	68	96	49	61	89	28	40	68	13	25	53
NCB20-L2-N0...	110	200	56	68	96	49	61	89	28	40	68	13	25	53
NCN20+U...+N0...	110	160	56	68	96	49	61	89	28	40	68	13	25	53
NCN30+U...+N0...	110	160	56	68	96	49	61	89	28	40	68	13	25	53
NCB40-FP-N0..	220	360	56	68	96	49	61	89	28	40	68	13	25	53
NCN40+U...+N0...	120	130	56	68	96	49	61	89	28	40	68	13	25	53
NCN40-L2-N0...	105	300	56	68	96	49	61	89	28	40	68	13	25	53
NCN50-FP-N0...	220	360	56	68	96	49	61	89	28	40	68	13	25	53
NJ 0,8-F-N...	30	50	56	68	96	49	61	89	28	40	68	13	25	53
NJ 1,5-F-N...	30	50	56	68	96	49	61	89	28	40	68	13	25	53
NJ 2,5-F-N...	40	50	56	68	96	49	61	89	28	40	68	13	25	53
NJ 2-F1-N...	30	50	56	68	96	49	61	89	28	40	68	13	25	53
NJ 2-V3-N...	40	50	56	68	96	49	61	89	28	40	68	13	25	53
NJ 3-V3-N...	40	50	56	68	96	49	61	89	28	40	68	13	25	53
NJ 4-F-N...	150	100	56	68	96	49	61	89	28	40	68	13	25	53
NJ 6-F-N	70	100	56	68	96	49	61	89	28	40	68	13	25	53
NJ 10-F-N...	85	100	56	68	96	49	61	89	28	40	68	13	25	53
NJ 15+U.+N...	140	130	56	68	96	49	61	89	28	40	68	13	25	53
NJ 15-M1.-N...	140	100	56	68	96	49	61	89	28	40	68	13	25	53
NJ 20+U.+N...	150	130	56	68	96	49	61	89	28	40	68	13	25	53
NJ 30+U.+N...	160	130	56	68	96	49	61	89	28	40	68	13	25	53
NJ 30P+U.+1N...	150	170	56	68	96	49	61	89	28	40	68	13	25	53
NJ 40+...+N...	180	130	56	68	96	49	61	89	28	40	68	13	25	53
NJ 50-FP-N...	320	360	56	68	96	49	61	89	28	40	68	13	25	53

Table 1: Application as category-1 equipment

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
FJ 6-110-N...	150	110	73	88	100	73	88	100	62	77	81	54	63	63
FJ 7-N...	65	220	73	88	100	73	88	100	62	77	81	54	63	63
NCB2-F1-N0...	90	100	73	88	100	66	81	100	45	60	89	30	45	74
NCB2-V3-N0...	100	100	73	88	100	66	81	100	45	60	89	30	45	74
NCN2-F56-N1...	100	100	75	90	100	70	85	100	55	70	87	-	-	-
NBN3-F69-N0...	100	100	72	87	100	65	80	100	41	56	63	24	37	37
NBN4-V3-N0...	100	100	73	88	100	66	81	100	45	60	89	30	45	74
NBN4-V3-N0-Y189289	120	100	72	87	100	65	80	100	41	56	63	24	37	37
NCN4-V3-N0...	100	100	73	88	100	66	81	100	45	60	89	30	45	74
NCB15+U...+N0...	110	160	73	88	100	66	81	100	45	60	89	30	45	74
NCN15-M...-N0..	100	100	73	88	100	66	81	100	45	60	89	30	45	74
NCB20-L2-N0...	110	200	73	88	100	66	81	100	45	60	89	30	45	74
NCN20+U...+NO...	110	160	73	88	100	66	81	100	45	60	89	30	45	74
NCN30+U...+NO...	110	160	73	88	100	66	81	100	45	60	89	30	45	74
NCB40-FP-N0..	220	360	73	88	100	66	81	100	45	60	89	30	45	74
NCN40+U...+NO...	120	130	73	88	100	66	81	100	45	60	89	30	45	74
NCN40-L2-N0...	105	300	73	88	100	66	81	100	45	60	89	30	45	74
NCN50-FP-N0...	220	360	73	88	100	66	81	100	45	60	89	30	45	74
NJ 0,8-F-N...	30	50	73	88	100	67	82	100	45	60	78	30	45	57
NJ 1,5-F-N...	30	50	73	88	100	67	82	100	45	60	78	30	45	57
NJ 2,5-F-N...	40	50	73	88	100	66	81	100	45	60	89	30	45	74
NJ 2-F1-N...	30	50	73	88	100	66	81	100	45	60	89	30	45	74
NJ 2-V3-N...	40	50	73	88	100	66	81	100	45	60	89	30	45	74
NJ 3-V3-N...	40	50	73	88	100	66	81	100	45	60	89	30	45	74
NJ 4-F-N...	150	100	73	88	100	66	81	100	45	60	89	30	45	74
NJ 6-F-N	70	100	73	88	100	66	81	100	45	60	89	30	45	74
NJ 10-F-N...	85	100	73	88	100	66	81	100	45	60	89	30	45	74
NJ 15+U.+N...	140	130	73	88	100	66	81	100	45	60	89	30	45	74
NJ 15-M1.-N...	140	100	73	88	100	66	81	100	45	60	89	30	45	74
NJ 20+U.+N...	150	130	73	88	100	66	81	100	45	60	89	30	45	74
NJ 30+U.+N...	160	130	73	88	100	66	81	100	45	60	89	30	45	74
NJ 30P+U.+1N...	150	170	73	88	100	66	81	100	45	60	89	30	45	74
NJ 40+...+N...	180	130	73	88	100	66	81	100	45	60	89	30	45	74
NJ 50-FP-N...	320	360	73	88	100	66	81	100	45	60	89	30	45	74

Tabelle 2: Application as category-2 equipment

4. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 00 ATEX 2032 X

Special conditions for safe use

1. For the application within a temperature range of -60 °C to -20 °C the cuboidal inductive sensors, types FJ..., NJ..., NB... and NC... must be protected against damage due to impact by mounting into an additional housing.
2. The connection facilities of the cuboidal inductive sensors, types FJ..., NJ..., NB... and NC... shall be installed as such that at least a degree of protection of IP20 according to IEC-publication 60529:1989 is met.
3. The 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 cuboidal inductive sensors, is shown in tables No.1 and No.2 given in this 4. supplement to EC-type-examination certificate PTB 00 ATEX 2032 X.
4. When the following types of cuboidal inductive sensors are applied corresponding to explosion groups and equipment categories tabulated below, inadmissible electrostatic charge of the plastic housing has to be avoided. An appropriate warning note is to be indicated the equipment

type	application as category-1 equipment	application as category-2 equipment
FJ 6-110-N...	IIB/IIC	IIC
FJ 7-N...	IIC	-
NCB2-F1-N0...	IIC	-
NCB2-V3-N0...	IIC	-
NBN3-F69-N0...	IIC	-
NBN4-V3-N0...	IIC	-
NBN4-V3-N0-Y189289	IIC	-
NCN4-V3-N0...	IIC	-
NCB15+U...+N0...	IIC	IIC
NCN15-M...-N0..	IIC	-
NCB20-L2-N0...	IIC	-
NCN20+U...+NO...	IIC	IIC
NCN30+U...+NO...	IIC	IIC
NCB40-FP-N0..	IIA/IIB/IIC	IIC
NCN40+U...+NO...	IIB/IIC	IIC
NCN40-L2-N0...	IIC	-
NCN50-FP-N0...	IIA/IIB/IIC	IIC
NJ 2,5-F-N...	IIC	-
NJ 2-F1-N...	IIC	-
NJ 2-V3-N...	IIC	-
NJ 3-V3-N...	IIC	-

4. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 00 ATEX 2032 X

NJ 4-F-N...	IIC	IIC
NJ 6-F-N	IIC	-
NJ 10-F-N...	IIC	-
NJ 15+U.+N...	IIC	IIC
NJ 15-M1.-N...	IIC	-
NJ 20+U.+N...	IIC	IIC
NJ 30+U.+N...	IIC	IIC
NJ 30P+U.+1N...	IIB/IIC	IIC
NJ 40+...+N...	IIB/IIC	IIC
NJ 50-FP-N...	IIA/IIB/IIC	IIC

5. Inadmissible electrostatic charge of parts of the metal housing has to be avoided for the following types of cuboidal inductive sensors. Dangerous electrostatic charge 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) do not need to be grounded:

FJ 6-110-N...	NCN30+U4+N0...	NJ 20+U4+N...
FJ 7-N...	NCN40-L2-N0...	NJ 30+U3+N...
NCB15+U3+N0...	NCN40+U3+N0...	NJ 30+U4+N...
NCB15+U4+N0...	NCN40+U4+N0...	NJ 30P+U3+1N...
NCB20-L2-N0...	NCN50-FP-N0-P3...	NJ 30P+U4+1N...
NCB40-FP-N0-P3...	NCN50-FP-N0-P4...	NJ 40+U3+N...
NCB40-FP-N0-P4...	NJ 15+U3+N...	NJ 40+U4+N...
NCN20+U3+N0...	NJ 15+U4+N...	NJ 50-FP-N-P3...
NCN20+U4+N0...	NJ 15-M1-N-V	NJ 50-FP-N-P4...
NCN30+U3+N0...	NJ 20+U3+N...	

Test report: PTB Ex 06-25344

Zertifizierungsstelle Explosionsschutz

By order:

Dr.-Ing. U. Johannsmeyer
Direktor und Professor



Braunschweig, April 20, 2006