



Prüf- und Zertifizierungsstelle

ZELM Ex



(1) **EC-TYPE-EXAMINATION CERTIFICATE**

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

(3) EC-TYPE-EXAMINATION CERTIFICATE Number:

ZELM 03 ATEX 0128 X

(4) Equipment: Proximity sensors types CB..., CC..., CJ..., NC..., NJ..., SC..., SJ...

(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 Prüf- und Zertifizierungsstelle ZELM Ex, notified body No. 0820 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 ZELM Ex 0840217167

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

prEN 61241-0: 2002

31H/143/CD (IEC 61241-11): 2002

(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, examination and tests of the specified equipment or protective system in accordance to the Directive 94/9/EC. Further requirements of the Directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by this Certificate.

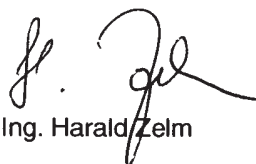
(12) The marking of the equipment shall include the following:



II 1 D Ex iaD 20 T... °C

Zertifizierungsstelle **ZELM Ex**

Braunschweig, March 28, 2003


Dipl.-Ing. Harald Zelm



Sheet 1/5

EC-type-examination Certificates without signature and stamp are not valid. The certificates may only be circulated without alteration. Extracts or alterations are subject to approval by the Prüf- und Zertifizierungsstelle ZELM Ex. This English version is based on the German text. In the case of dispute, the German text shall prevail.



(13)

SCHEDULE

(14) **EC-TYPE-EXAMINATION CERTIFICATE ZELM 03 ATEX 0128 X**

(15) Description of equipment

The types CB..., CC..., CJ..., NC..., NJ..., SC..., SJ... inductive and capacitive sensors are used for converting of position detection into electrical signals within the explosive atmosphere of category 1 D or 2 D or 3 D.

The inductive and capacitive sensors may be mounted across the boundary between zones 20 and 21 or 21 and 22 respectively.

They shall be used with intrinsically safe circuits. The sensors category depends on the connected intrinsically safe supply circuit.

The inductive and capacitive sensors consist of a resin-potted plastic or metallic housing. The supply connections are made by cable, litz wires, or by screw- or clamp-type terminals.

Instead of the points of the model code other letter- or numeral- combinations will be stated, which are describing several variations and versions of the equipment.

Electrical data

Supply and signal circuit

type of protection Intrinsic Safety Ex iaD or Ex ibD or EEx ia IIB or EEx ib IIB
for connection to certified intrinsically safe circuits only

maximum values:

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

lower limit of ambient temperature: acc. table 2

The correlations between type of connected circuit, maximum ambient temperature and surface temperature are shown in the following table 1:

Table 1

type	type 1 U _i = 16 V I _i = 25 mA P _i = 34 mW			type 2 U _i = 16 V I _i = 25 mA P _i = 64 mW			type 3 U _i = 16 V I _i = 52 mA P _i = 169 mW		
	Tu=40°C	Tu=70°C	Tu=100°C	Tu=40°C	Tu=70°C	Tu=100°C	Tu=40°C	Tu=70°C	Tu=100°C
	T	T	T	T	T	T	T	T	T
CB..., CC..., CJ...	44	73	-----	48	76	-----	60	85	-----
NJ10-22-N-E93-Y106925	44	73	-----	48	76	-----	60	85	-----
NJ10-22-N-E93-Y30629	44	73	-----	48	76	-----	60	85	-----
NJ10-22-N-E93-Y52737	44	73	-----	48	76	-----	60	85	-----
NC..., NJ..., SC..., SJ...	44	73	102	48	76	103	60	85	108

Tu: upper limit of ambient temperature



Schedule to EC-TYPE-EXAMINATION CERTIFICATE ZELM 03 ATEX 0128 X

The maximum effective internal capacitances and inductances of the various sensor types are shown in the following table 2:

Table 2

type	Ci/ nF	Li/ µH	T _{Umin} / °C	type	Ci/ nF	Li/ µH	T _{Umin} / °C
CBN2-F46-N...	45	0	- 25	NJ 2-V3-N...	40	50	- 25
CCN2-F46A-N...	45	0	- 25	NJ 15+U.+N...	140	130	- 25
CBN5-F46-N...	45	0	- 25	NJ 20+U.+N...	150	130	- 25
CCN5-F46A-N...	45	0	- 25	NJ 30+U.+N...	160	130	- 25
CBN10-F46-N...	45	0	- 25	NJ 40+...+N...	180	130	- 25
CCN10-F46A-N...	45	0	- 25	NJ 50-FP-N...	320	360	- 25
CCB10-30GM...-N...	155	0	- 25	SC2-N0...	150	150	- 25
CJ 1-12GK-N...	60	0	- 25	SC3,5-N0-Y...	150	150	- 25
CJ 2-18GK-N...	60	0	- 25	SC3,5...-N0...	150	150	- 25
CJ 4-12GK-N...	60	0	- 25	SJ 1,8-N-Y...	30	100	- 25
CJ 6-18GK-N...	60	0	- 25	SJ 2,2-N...	30	100	- 25
CJ 15-40-N...	140	0	- 25	SJ 2-N...	30	100	- 25
CJ 40-FP-N...	145	0	- 25	SJ 3,5-...-N...	50	250	- 25
NCB1,5...M...N0...	90	100	- 25	SJ 5-...-N...	50	250	- 25
NCB2-12GM...-N0...	90	100	- 25	SJ 5-K...	50	550	- 25
NCN4-12GM...-N0...	95	100	- 25	SJ 10-N...	50	1000	- 25
NCB5-18GM...-N0...	95	100	- 25	SJ 15-N...	150	1200	- 25
NCN8-18GM...-N0...	95	100	- 25	SJ 30-N...	150	1250	- 25
NCB10-30GM...-N0...	105	100	- 25	NJ 2-11-SN...	50	150	- 40
NCN15-30GM...-N0...	110	100	- 25	NJ 2-11-SN-G...	50	150	- 40
NJ 1,5-6,5...-N	30	50	- 25	NJ 2-12GK-SN...	50	150	- 40
NJ 1,5-8-N...	20	50	- 25	NJ 3-18GK-S1N...	70	200	- 25
NJ 2-11-N...	45	50	- 25	NJ 4-12GK-SN...	70	150	- 40
NJ 2-11-N-G...	30	50	- 25	NJ 5-18GK-SN...	120	200	- 40
NJ 5-11-N...	45	50	- 25	NJ 5-30GK-S1N...	100	200	- 25
NJ10-22-N...	130	100	- 25	NJ 6-22-SN...	110	150	- 40
NJ10-22-N-E93-Y106925	130	100	- 40	NJ 6-22-SN-G...	110	150	- 40
NJ10-22-N-E93-Y30629	130	100	- 25	NJ 6S1+U.+N...	180	150	- 40
NJ10-22-N-E93-Y52737	130	100	- 25	NJ 8-18GK-SN...	120	200	- 40
NCB2-F1-N0...	90	100	- 25	NJ 10-30GK-SN...	120	150	- 40
NCB2-V3-N0...	100	100	- 25	NJ 15-30GK-SN...	120	180	- 40
NCN4-V3-N0...	100	100	- 25	NJ 15S+U.+N...	180	150	- 40
NCB15+U...+N0...	110	160	- 25	NJ 20S+U.+N...	200	150	- 40
NCB40-FP-N0...	220	360	- 25	NJ 40-FP-SN...	370	300	- 40
NCN15-M...-N0...	100	100	- 25	SJ 2-SN...	30	100	- 40
NCN20+U...+N0...	110	160	- 25	SJ 2-S1N...	30	100	- 25
NCN30+U...+N0...	110	160	- 25	SJ 3,5-S1N...	30	100	- 25
NCN40+U...+N0...	120	130	- 25	SJ 3,5-SN...	30	100	- 40
NCN50-FP-N0...	220	360	- 25				

The indicated values of internal capacitances and inductances do consider a supply cord of 10 m length.



Schedule to EC-TYPE-EXAMINATION CERTIFICATE ZELM 03 ATEX 0128 X

References:

The instruction manual has to be considered, in particular for the mounting conditions, supply circuit and operating temperatures.

(16) Report No.

ZELM Ex 0840217167

(17) Special conditions for safe use

1. The correlations between type of connected circuit, maximum ambient temperature and surface temperature and the effective internal capacitances and inductances of the various sensor types are shown in the tables of clause (15).
2. The sensor supply must be made by separately certified intrinsically safe circuits. Because of possible ignition hazards, which can arise from faults and/or transient circulating currents in the potential equalization system, galvanic isolation in the supply and signal circuits is preferred. Associated apparatus without galvanic isolation may only be used whether the appropriate requirements according to IEC 60079-14 are met.
3. Operational electrostatic charges due to medium flow or mechanical rubbing must be excluded, if the charge-exposed plastic surface area is greater than approx. 100 cm² to avoid brush discharges.

4. For sensor types

CJ 40-FP-N...	NCN40+U...+NO...	NJ 40+U+...+N...	SJ 30-N...
NCB40-FP-NO...	NCN50-FP-NO...	NJ 50-FP-N...	NJ 40-FP-SN...

and applications with high charges to be expected (e.g. spray gun for paints, film material production, dust conveyors, machine frictional processes) the charge-exposed plastic surface area must be reduced to approx. 15 cm² by installation measures to avoid propagating brush discharges.

5. Hazardous electrostatic charges of metallic parts must be prevented. This can be made by connection to the local equipotential bonding, but very small metallic parts (e.g. screws) must not be earthed.
6. The tightness for the purposes of zone seal measures for the mounting across the boundary between different zones is not covered by this Certificate and must be ensured by appropriate measures of installation.



Prüf- und Zertifizierungsstelle

ZELM Ex



Schedule to EC-TYPE-EXAMINATION CERTIFICATE ZELM 03 ATEX 0128 X

(18) Essential Health and Safety Requirements

Met by above mentioned draft standards in accordance with Directive 94/9/EC. The sensors adhere to the standards EN 50014 and EN 50020. For dust atmospheres no harmonised european standards are available at the moment.

Zertifizierungsstelle ZELM Ex



Braunschweig, March 28, 2003


Dipl.-Ing. Harald Zelm



1. Supplement

(Supplement according to EC-Directive 94/9 Annex III letter 6)

to EC-type-examination Certificate

ZELM 03 ATEX 0128 X

Equipment: Proximity sensors types CB..., CC..., CJ..., NC..., NJ..., SC..., SJ...

Manufacturer: Pepperl + Fuchs GmbH

Address: D-68307 Mannheim

Description of supplement

The types CB..., CC..., CJ..., NC..., NJ..., SC..., SJ... inductive and capacitive sensors are supplemented with some further versions. The types of these versions are named as follows:

- NJ 0,8-5GM-N...
- NJ 2-12GK-N...
- NJ 2-12GM-N...
- NJ 4-12GK-N...
- NJ 4-12GM-N...
- NJ 5-18GK-N...
- NJ 5-18GM-N...
- NJ 8-18GK-N...
- NJ 8-18GM-N...
- NJ 10-30GK-N...
- NJ 10-30GM-N...
- NJ 15-30GK-N...
- NJ 15-30GM-N...
- NJ 4-12GK-SN-Y...

Marking **II 1 D Ex iaD 20 T... °C**

The maximum surface temperature „...“ is shown in table 1

The lower limit of ambient temperature: acc. table 2

Electrical data

The correlations between type of connected circuit, maximum ambient temperature and surface temperature are shown in the following table 1:

Table 1 (as supplement to table 1 of the EC-type examination certificate ZELM 03 ATEX 0128 X)

Typ	Typ 1				Typ 2				Typ 3			
	U _i = 16 V				U _i = 16 V				U _i = 16 V			
	I _i = 25 mA				I _i = 25 mA				I _i = 52 mA			
	P _i = 34 mW				P _i = 64 mW				P _i = 169 mW			
Typ	T _u = 40°C	T _u = 60°C	T _u = 70°C	T _u = 100°C	T _u = 40°C	T _u = 60°C	T _u = 70°C	T _u = 100°C	T _u = 40°C	T _u = 60°C	T _u = 70°C	T _u = 100°C
NJ 4-12GK-SN-Y...	44	64	73	-----	48	67	76	-----	60	77	85	-----
NC..., NJ..., SC..., SJ...	44	64	73	102	48	67	76	103	60	77	85	108

T_u: upper limit of ambient temperature



Prüf- und Zertifizierungsstelle

ZELM Ex



The maximum effective internal capacitances and inductances of the various sensor types are shown in the following table 2:

Table 2 (as supplement to table 2 of the EC-type examination certificate ZELM 03 ATEX 0128 X)

Typ	Ci / nF	Li / μ H	T _{Umin} / °C	Typ	Ci / nF	Li / μ H	T _{Umin} / °C
NJ 0,8-5GM-N...	30	50	- 25	NJ 8-18GK-N...	70	50	- 25
NJ 2-12GK-N...	45	50	- 25	NJ 8-18GM-N...	70	50	- 25
NJ 2-12GM-N...	30	50	- 25	NJ 10-30GK-N...	140	100	- 25
NJ 4-12GK-N...	45	50	- 25	NJ 10-30GM-N...	140	100	- 25
NJ 4-12GM-N...	45	50	- 25	NJ 15-30GK-N...	140	100	- 25
NJ 5-18GK-N...	70	50	- 25	NJ 15-30GM-N...	140	100	- 25
NJ 5-18GM-N...	70	50	- 25	NJ 4-12GK-SN-Y...	70	150	- 45

The indicated values of internal capacitances and inductances do consider a supply cord of 10 m length.

Report No.

ZELM Ex 0110419268

Special conditions for safe use

The special conditions of the EC-type-examination Certificate ZELM 03 ATEX 0128 X are valid further on. The following is additionally applied:

1. For the operation in current circuits which reach the level of protection *ib* IIB resp. *ib*D, the use in areas resp. between areas which require category 1 is not permitted.

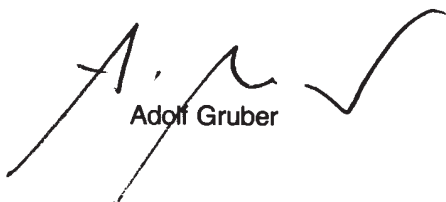
Essential Health and Safety Requirements

met by adherence to the standards which are given in the EC-type-examination Certificate.

Zertifizierungsstelle ZELM Ex



Braunschweig, April 1st, 2004


Adolf Gruber



2. Supplement

(Supplement according to EC-Directive 94/9 Annex III letter 6)

to EC-type-examination Certificate

ZELM 03 ATEX 0128 X

Equipment: Proximity sensors types CB..., CC..., CJ..., NC..., NJ..., SC..., SJ...
 Manufacturer: Pepperl + Fuchs GmbH
 Address: D-68307 Mannheim

Description of supplement

The types CB..., CC..., CJ..., NC..., NJ..., SC..., SJ... inductive and capacitive sensors are supplemented with some further versions. The types of these versions are named as follows:

NCN2-F56-N1...	NCB10-30GK...-N0...
NCB2-12GK...-N0...	NCN15-30GK...-N0...
NCN4-12GK...-N0...	NJ 1,5-F-N...
NCB5-18GK...-N0...	NJ 1,5-18GM-N-D...
NCN8-18GK...-N0...	

In future the lower limit of ambient temperature will be reduced for the following sensor types, which are already covered by the EC-type-examination Certificate ZELM 03 ATEX 0128 X respective by the 1. Supplement.

NJ 4-12GK-SN...	NJ 10-30GK-SN...
NJ 4-12GK-SN-Y...	SJ 3,5-SN...

Instead of the points of the model code other letter- or numerical- combinations will be stated, which are describing not safety relevant variations of the equipment.

Electrical data:

The correlations between type of connected circuit, maximum ambient temperature and surface temperature are shown in the following table 1:

table 1 (as supplement to table 1 of the EC-type-examination Certificate ZELM 03 ATEX 0128 X and the 1. Supplement)

type	type 1					type 2					type 3				
	Ui = 16 V					Ui = 16 V					Ui = 16 V				
	Ii = 25 mA					Ii = 25 mA					Ii = 52 mA				
	Pi = 34 mW					Pi = 64 mW					Pi = 169 mW				
type	Tu= 40°C	Tu= 60°C	Tu= 70°C	Tu= 85°C	Tu= 100°C	Tu= 40°C	Tu= 60°C	Tu= 70°C	Tu= 85°C	Tu= 100°C	Tu= 40°C	Tu= 60°C	Tu= 70°C	Tu= 85°C	Tu= 100°C
NCN2-F56-N1...	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
NC..., NJ..., SC..., SJ...	44	64	73	88	102	48	67	76	90	103	60	77	85	97	108

Tu: upper limit of ambient temperature

The maximum effective internal capacitances and inductances of the various sensor types are shown in the following table 2:



Prüf- und Zertifizierungsstelle

ZELM Ex



2. SUPPLEMENT OF THE EC-TYPE-EXAMINATION CERTIFICATE ZELM 03 ATEX 0128

table 2 (as supplement to table 2 of the EC-type-examination Certificate ZELM 03 ATEX 0128 X and the 1. Supplement)

type	Ci / nF	Li / μ H	T _{Umin} / °C	type	Ci / nF	Li / μ H	T _{Umin} / °C
NCN2-F56-N1...	100	100	-25	NCB10-30GK...-NO...	105	100	-25
NCB2-12GK...-NO...	90	100	-25	NCN15-30GK...-NO...	110	100	-25
NCN4-12GK...-NO...	95	100	-25	NJ 1,5-F-N...	30	50	-25
NCB5-18GK...-NO...	95	100	-25	NJ 1,5-18GM-N-D	50	60	-25
NCN8-18GK...-NO...	95	100	-25				

The indicated values of internal capacitances and inductances consider a supply cord of 10 m length.

With this 2. Supplement the lower limit of ambient temperature for some certificated sensors will be reduced. The new lower limit of ambient temperature for this sensor types are shown in the following table 3:

table 3 (replace the relevant giving of the sensors into the table 2 of the EC-type-examination Certificate ZELM 03 ATEX 0128 X and the 1. Supplement)

type	Ci / nF	Li / μ H	T _{Umin} / °C	type	Ci / nF	Li / μ H	T _{Umin} / °C
NJ 4-12GK-SN...	70	150	-50	NJ 10-30GK-SN...	120	150	-50
NJ 4-12GK-SN-Y...	70	150	-50	SJ 3,5-SN...	30	100	-50

The indicated values of internal capacitances and inductances consider a supply cord of 10 m length.

Report No.

ZELM Ex 0210515369

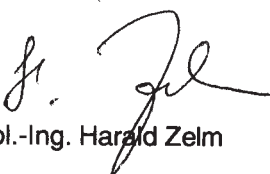
Special conditions for safe use

The special conditions of the EC-type-examination Certificate ZELM 03 ATEX 0128 X and of the 1. Supplement are valid further on.

Essential Health and Safety Requirements

The essential Health and Safety Requirements are further met by concordance with the standards scheduled in the EC-Type-examination Certificate.

Zertifizierungsstelle ZELM Ex


Dipl.-Ing. Harald Zelm



Braunschweig, April 25, 2005

Sheet 2 / 2

EC-type-examination Certificates without signature and stamp are not valid. The certificates may only be circulated without alteration. Extracts or alterations are subject to approval by the Prüf- und Zertifizierungsstelle ZELM Ex. This English version is based on the German text. In the case of dispute, the German text shall prevail.