



## Model Number

NCB4-12GM40-N0-V1

## Features

- 4 mm flush
- Usable up to SIL 2 acc. to IEC 61508

## Accessories

### BF 12

Mounting flange, 12 mm

### V1-G-N-2M-PUR

Female cordset, M12, 2-pin, NAMUR, PUR cable

### V1-W-N-2M-PUR

Female cordset, M12, 2-pin, NAMUR, PUR cable

## Technical Data

### General specifications

Switching function		Normally closed (NC)
Output type		NAMUR
Rated operating distance	$s_n$	4 mm
Installation		flush
Assured operating distance	$s_a$	0 ... 3.24 mm
Actual operating distance	$s_r$	3.6 ... 4.4 mm typ.
Reduction factor $r_{AI}$		0.41
Reduction factor $r_{CU}$		0.39
Reduction factor $r_{304}$		0.78
Output type		2-wire

### Nominal ratings

Nominal voltage	$U_o$	8.2 V ( $R_i$ approx. 1 k $\Omega$ )
Switching frequency	$f$	0 ... 1500 Hz
Hysteresis	$H$	1 ... 15 typ. 5 %
Reverse polarity protection		reverse polarity protected
Short-circuit protection		yes
Suitable for 2:1 technology		yes, Reverse polarity protection diode not required
Current consumption		
Measuring plate not detected		$\geq 2.2$ mA
Measuring plate detected		$\leq 1$ mA
Switching state indicator		Multihole-LED, yellow

### Functional safety related parameters

MTTF <sub>d</sub>		3010 a
Mission Time ( $T_M$ )		20 a
Diagnostic Coverage (DC)		0 %

### Ambient conditions

Ambient temperature		-25 ... 100 °C (-13 ... 212 °F)
Storage temperature		-40 ... 100 °C (-40 ... 212 °F)

### Mechanical specifications

Connection type		Connector plug M12 x 1, 4-pin
Core cross-section		-
Housing material		Stainless steel 1.4305 / AISI 303
Sensing face		PBT
Degree of protection		IP67

### General information

Scope of delivery		2 self locking nuts in scope of delivery
Use in the hazardous area		see instruction manuals
Category		1G; 2G; 3G; 1D; 3D

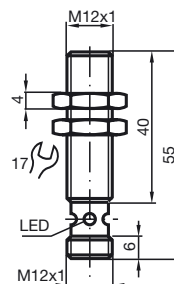
### Compliance with standards and directives

Standard conformity		
NAMUR		EN 60947-5-6:2000 IEC 60947-5-6:1999
Electromagnetic compatibility Standards		NE 21:2007 EN 60947-5-2:2007 EN 60947-5-2/A1:2012 IEC 60947-5-2:2007 IEC 60947-5-2 AMD 1:2012

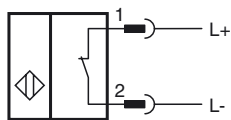
### Approvals and certificates

EAC conformity		TR CU 012/2011
FM approval		
Control drawing		116-0165
UL approval		
Ordinary Location		E87056
Hazardous Location		E501628
Control drawing		116-0452
CSA approval		cCSAus Listed, General Purpose
CCC approval		CCC approval / marking not required for products rated $\leq 36$ V

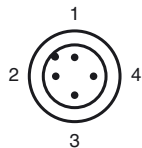
## Dimensions



**Electrical Connection**



**Pinout**



Wire colors in accordance with EN 60947-5-6

1	BN	(brown)
2	BU	(blue)

**Equipment protection level Ga**

CE marking	CE 0102	
ATEX marking	Ex II 1G Ex ia IIC T6...T1 Ga The Ex-related marking can also be printed on the enclosed label.	
Standards	EN 60079-0:2012+A11:2013 EN 60079-11:2012 Ignition protection "Intrinsic safety" Use is restricted to the following stated conditions	
Appropriate type	NCB4-12GM...-N0...	
Effective internal capacitance	$C_i$	$\leq 120$ nF ; a cable length of 10 m is considered.
Effective internal inductance	$L_i$	$\leq 50$ $\mu$ H ; a cable length of 10 m is considered.
Ambient temperature	Details of the correlation between the type of circuit connected, the maximum permissible ambient temperature, the temperature class, and the effective internal reactance values can be found on the EC-type examination certificate. <b>Note:</b> Use the temperature table for category 1 !!! The 20 % reduction in accordance with EN 1127-1 has already been applied to the temperature table for category 1.	

**Equipment protection level Gb**

CE marking	CE 0102	
ATEX marking	Ex II 1G Ex ia IIC T6...T1 Ga The Ex-significant identification is on the enclosed adhesive label	
Standards	EN 60079-0:2012+A11:2013 EN 60079-11:2012 Ignition protection "Intrinsic safety" Use is restricted to the following stated conditions	
Appropriate type	NCB4-12GM...-N0...	
Effective internal capacitance	$C_i$	$\leq 120$ nF ; a cable length of 10 m is considered.
Effective internal inductance	$L_i$	$\leq 50$ $\mu$ H ; a cable length of 10 m is considered.
Maximum permissible ambient temperature $T_{amb}$	Details of the correlation between the type of circuit connected, the maximum permissible ambient temperature, the temperature class, and the effective internal reactance values can be found on the EC-type examination certificate.	

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**Equipment protection level Gc (ic)**

Certificate	PF 13 CERT 2895 X
CE marking	CE

ATEX marking	⊕ II 3G Ex ic IIC T6...T1 Gc The Ex-significant identification is on the enclosed adhesive label
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Standards	EN 60079-0:2012+A11:2013 EN 60079-11:2012 Ignition protection category "ic" Use is restricted to the following stated conditions
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Effective internal capacitance $C_i$	$\leq 120 \text{ nF}$ ; a cable length of 10 m is considered.
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Effective internal inductance $L_i$	$\leq 50 \text{ }\mu\text{H}$ ; A cable length of 10 m is considered.
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**Special conditions**

for $P_i=34 \text{ mW}$ , $I_i=25 \text{ mA}$ , T6	55 °C (131 °F)
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for $P_i=34 \text{ mW}$ , $I_i=25 \text{ mA}$ , T5	55 °C (131 °F)
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for $P_i=34 \text{ mW}$ , $I_i=25 \text{ mA}$ , T4-T1	55 °C (131 °F)
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for $P_i=64 \text{ mW}$ , $I_i=25 \text{ mA}$ , T6	55 °C (131 °F)
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for $P_i=64 \text{ mW}$ , $I_i=25 \text{ mA}$ , T5	55 °C (131 °F)
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for $P_i=64 \text{ mW}$ , $I_i=25 \text{ mA}$ , T4-T1	55 °C (131 °F)
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for $P_i=169 \text{ mW}$ , $I_i=52 \text{ mA}$ , T6	41 °C (105.8 °F)
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for $P_i=169 \text{ mW}$ , $I_i=52 \text{ mA}$ , T5	41 °C (105.8 °F)
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for $P_i=169 \text{ mW}$ , $I_i=52 \text{ mA}$ , T4-T1	41 °C (105.8 °F)
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for $P_i=242 \text{ mW}$ , $I_i=76 \text{ mA}$ , T6	29 °C (84.2 °F)
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for $P_i=242 \text{ mW}$ , $I_i=76 \text{ mA}$ , T5	29 °C (84.2 °F)
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for $P_i=242 \text{ mW}$ , $I_i=76 \text{ mA}$ , T4-T1	29 °C (84.2 °F)
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**Equipment protection level Gc (nL)**

Standard conformity	EN 60079-15:2005 Ignition protection category "n" Use is restricted to the following stated conditions
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Effective internal capacitance $C_i$	$\leq 120 \text{ nF}$ ; a cable length of 10 m is considered.
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Effective internal inductance $L_i$	$\leq 50 \text{ }\mu\text{H}$ ; A cable length of 10 m is considered.
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General	The apparatus has to be operated according to the appropriate data in the data sheet and in this instruction manual. The data stated in the data sheet are restricted by this operating instruction! The special conditions must be observed! The ATEX Directive applies only to the use of apparatus under atmospheric conditions. If you use the device outside atmospheric conditions, consider that the permissible safety parameters should be reduced.
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**Special conditions**

for $P_i=34 \text{ mW}$ , $I_i=25 \text{ mA}$ , T6	55 °C (131 °F)
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for $P_i=34 \text{ mW}$ , $I_i=25 \text{ mA}$ , T5	55 °C (131 °F)
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for $P_i=34 \text{ mW}$ , $I_i=25 \text{ mA}$ , T4-T1	55 °C (131 °F)
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for $P_i=64 \text{ mW}$ , $I_i=25 \text{ mA}$ , T6	55 °C (131 °F)
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for $P_i=64 \text{ mW}$ , $I_i=25 \text{ mA}$ , T5	55 °C (131 °F)
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for $P_i=64 \text{ mW}$ , $I_i=25 \text{ mA}$ , T4-T1	55 °C (131 °F)
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for $P_i=169 \text{ mW}$ , $I_i=52 \text{ mA}$ , T6	41 °C (105.8 °F)
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for $P_i=169 \text{ mW}$ , $I_i=52 \text{ mA}$ , T5	41 °C (105.8 °F)
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for $P_i=169 \text{ mW}$ , $I_i=52 \text{ mA}$ , T4-T1	41 °C (105.8 °F)
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for $P_i=242 \text{ mW}$ , $I_i=76 \text{ mA}$ , T6	29 °C (84.2 °F)
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for $P_i=242 \text{ mW}$ , $I_i=76 \text{ mA}$ , T5	29 °C (84.2 °F)
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for $P_i=242 \text{ mW}$ , $I_i=76 \text{ mA}$ , T4-T1	29 °C (84.2 °F)
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**Equipment protection level Da**

CE marking	CE 0102
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ATEX marking	⊕ II 1D Ex ia IIC T135°C Da The Ex-related marking can also be printed on the enclosed label.
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Standards	EN 60079-0:2012+A11:2013 EN 60079-11:2012 Ignition protection "Intrinsic safety" Use is restricted to the following stated conditions
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Appropriate type	NCB4-12GM...-N0...
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Effective internal capacitance $C_i$	$\leq 120 \text{ nF}$ A cable length of 10 m is considered.
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Effective internal inductance $L_i$	$\leq 50 \text{ }\mu\text{H}$ ; a cable length of 10 m is considered.
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Maximum permissible ambient temperature $T_{amb}$	Details of the correlation between the type of circuit connected, the maximum permissible ambient temperature, the surface temperature, and the effective internal reactance values can be found on the EC-type-examination certificate. <b>The maximum permissible ambient temperature of the data sheet must be noted, in addition, the lower of the two values must be maintained.</b>
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**Equipment protection level Dc**

CE marking	CE 0102
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ATEX marking	⊕ II 3D IP67 T 111 °C (231.8 °F) X The Ex-significant identification is on the enclosed adhesive label
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Standards	EN 50281-1-1 Protection via housing Use is restricted to the following stated conditions
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**Special conditions**

Maximum heating (Temperature rise)	Values can be obtained from the following list, depending on the max. operating voltage $U_{B \text{ max}}$ and the minimum series resistance $R_v$ .
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at $U_{B \text{ max}}=9 \text{ V}$ , $R_v=562 \text{ }\Omega$	11 K
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using an amplifier in accordance with EN 60947- 11 K  
5-6

**Equipment protection level Dc (tc)**

CE marking

CE

ATEX marking

II 3D Ex tc IIIC T80°C Dc  
The Ex-related marking can also be printed on the enclosed label.

Standards

EN 60079-0:2012+A11:2013, EN 60079-31:2014  
Protection by enclosure "tc" Some of the information in this instruction manual is more specific than the information provided in the datasheet.

General

The corresponding datasheets, declarations of conformity, EC-type examination certificates, certifications, and control drawings, where applicable (see datasheets), form an integral part of this document. These documents can be found at [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com). The maximum surface temperature of the device was determined without a layer of dust on the apparatus. Some of the information in this instruction manual is more specific than the information provided in the datasheet.

**Special conditions**

Maximum permissible ambient temperature  $T_{Umax}$  Values can be obtained from the following list, depending on the max. operating voltage  $U_{bmax}$  and the minimum series resistance  $R_v$ .

at  $U_{Bmax}=9\text{ V}$ ,  $R_v=562\ \Omega$  58 °C (136.4 °F)

using an amplifier in accordance with EN 60947- 58 °C (136.4 °F)  
5-6

**Equipment protection level Dc (tD)**

General

The apparatus has to be operated according to the appropriate data in the data sheet and in this instruction manual. The maximum surface temperature has been determined in accordance with method A without a dust layer on the equipment.  
The data stated in the data sheet are restricted by this operating instruction!  
The special conditions must be adhered to!

**Special conditions**

Minimum series resistance  $R_v$  A minimum series resistance  $R_v$  is to be provided between the power supply voltage and the proximity switch in accordance with the following list. This can also be assured by using a switch amplifier.

Maximum permissible ambient temperature  $T_{Umax}$  Values can be obtained from the following list, depending on the max. operating voltage  $U_{bmax}$  and the minimum series resistance  $R_v$ .

at  $U_{Bmax}=9\text{ V}$ ,  $R_v=562\ \Omega$  58 °C (136.4 °F)

using an amplifier in accordance with EN 60947- 58 °C (136.4 °F)  
5-6



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