



Model Number

NCB4-12GM40-N0

Features

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

Accessories

BF 12

Mounting flange, 12 mm

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 Ω)
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	≥ 2.2 mA
Measuring plate detected	≤ 1 mA
Switching state indicator	all direction LED, yellow

Functional safety related parameters

MTTF _d	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	cable PVC, 2 m
Core cross-section	0.34 mm ²
Housing material	Stainless steel 1.4305 / AISI 303
Sensing face	PBT
Degree of protection	IP66 / IP67
Cable	
Bending radius	> 10 x cable diameter

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

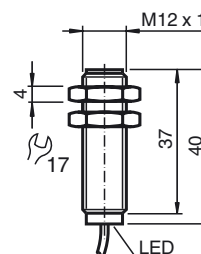
Compliance with standards and directives

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

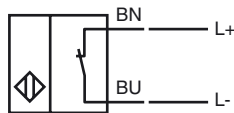
Approvals and certificates

EAC conformity	TR CU 012/2011
FM approval	
Control drawing	116-0165
UL approval	cULus Listed, General Purpose
CSA approval	cCSAus Listed, General Purpose
CCC approval	CCC approval / marking not required for products rated ≤ 36 V

Dimensions



Electrical Connection



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 inductivity	C_i	$\leq 120 \text{ nF}$; a cable length of 10 m is considered.
Effective internal inductance	L_i	$\leq 50 \text{ }\mu\text{H}$; 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. Note: 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 inductivity	C_i	$\leq 120 \text{ nF}$; a cable length of 10 m is considered.
Effective internal inductance	L_i	$\leq 50 \text{ }\mu\text{H}$; 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.	

Equipment protection level Gc (ic)

Certificate	PF 13 CERT 2895 X	
CE marking	CE	
ATEX marking	Ex II 3G Ex ic IIC T6...T1 Gc The Ex-significant identification is on the enclosed adhesive label	
Standards	EN 60079-0:2012+A11:2013 EN 60079-11:2012 Ignition protection category "ic" Use is restricted to the following stated conditions	
Effective internal inductivity	C_i	$\leq 120 \text{ nF}$; a cable length of 10 m is considered.
Effective internal inductance	L_i	$\leq 50 \text{ }\mu\text{H}$; A cable length of 10 m is considered.

Special conditions

for $P_i=34 \text{ mW}$, $I_i=25 \text{ mA}$, T6	74 °C (165.2 °F)
for $P_i=34 \text{ mW}$, $I_i=25 \text{ mA}$, T5	89 °C (192.2 °F)
for $P_i=34 \text{ mW}$, $I_i=25 \text{ mA}$, T4-T1	100 °C (212 °F)
for $P_i=64 \text{ mW}$, $I_i=25 \text{ mA}$, T6	69 °C (156.2 °F)
for $P_i=64 \text{ mW}$, $I_i=25 \text{ mA}$, T5	84 °C (183.2 °F)
for $P_i=64 \text{ mW}$, $I_i=25 \text{ mA}$, T4-T1	100 °C (212 °F)
for $P_i=169 \text{ mW}$, $I_i=52 \text{ mA}$, T6	51 °C (123.8 °F)
for $P_i=169 \text{ mW}$, $I_i=52 \text{ mA}$, T5	66 °C (150.8 °F)
for $P_i=169 \text{ mW}$, $I_i=52 \text{ mA}$, T4-T1	74 °C (165.2 °F)
for $P_i=242 \text{ mW}$, $I_i=76 \text{ mA}$, T6	39 °C (102.2 °F)
for $P_i=242 \text{ mW}$, $I_i=76 \text{ mA}$, T5	52 °C (125.6 °F)
for $P_i=242 \text{ mW}$, $I_i=76 \text{ mA}$, T4-T1	52 °C (125.6 °F)

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Equipment protection level Gc (nL)

Standard conformity	EN 60079-15:2003 Ignition protection category "n" Use is restricted to the following stated conditions
Effective internal capacitance C_i	$\leq 120 \text{ nF}$; a cable length of 10 m is considered.
Effective internal inductance L_i	$\leq 50 \text{ }\mu\text{H}$; A cable length of 10 m is considered.
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.

Special conditions

for $P_i=34 \text{ mW}$, $I_i=25 \text{ mA}$, T6	74 °C (165.2 °F)
for $P_i=34 \text{ mW}$, $I_i=25 \text{ mA}$, T5	89 °C (192.2 °F)
for $P_i=34 \text{ mW}$, $I_i=25 \text{ mA}$, T4-T1	100 °C (212 °F)
for $P_i=64 \text{ mW}$, $I_i=25 \text{ mA}$, T6	69 °C (156.2 °F)
for $P_i=64 \text{ mW}$, $I_i=25 \text{ mA}$, T5	84 °C (183.2 °F)
for $P_i=64 \text{ mW}$, $I_i=25 \text{ mA}$, T4-T1	100 °C (212 °F)
for $P_i=169 \text{ mW}$, $I_i=52 \text{ mA}$, T6	51 °C (123.8 °F)
for $P_i=169 \text{ mW}$, $I_i=52 \text{ mA}$, T5	66 °C (150.8 °F)
for $P_i=169 \text{ mW}$, $I_i=52 \text{ mA}$, T4-T1	74 °C (165.2 °F)
for $P_i=242 \text{ mW}$, $I_i=76 \text{ mA}$, T6	39 °C (102.2 °F)
for $P_i=242 \text{ mW}$, $I_i=76 \text{ mA}$, T5	52 °C (125.6 °F)
for $P_i=242 \text{ mW}$, $I_i=76 \text{ mA}$, T4-T1	52 °C (125.6 °F)

Equipment protection level Da

CE marking	CE 0102
ATEX marking	Ex II 1D Ex ia IIC T135°C Da 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 inductivity C_i	$\leq 120 \text{ nF}$ A cable length of 10 m is considered.
Effective internal inductance L_i	$\leq 50 \text{ }\mu\text{H}$; 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 surface temperature, and the effective internal reactance values can be found on the EC-type-examination certificate. The maximum permissible ambient temperature of the data sheet must be noted, in addition, the lower of the two values must be maintained.

Equipment protection level Dc

CE marking	CE 0102
ATEX marking	Ex II 3D IP67 T 111 °C (231.8 °F) X
Standards	EN 50281-1-1 Protection via housing Use is restricted to the following stated conditions
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 .
at $U_{Bmax}=9 \text{ V}$, $R_v=562 \text{ }\Omega$	11 K
using an amplifier in accordance with EN 60947- 11 K	
5-6	