



Model Number

NCB1,5-8GM25-N0

Features

- 1.5 mm flush

Accessories

BF 8

Mounting flange, 8 mm

Technical Data

General specifications

Switching element function		NAMUR, NC
Rated operating distance	s_n	1.5 mm
Installation		flush
Output polarity		NAMUR
Assured operating distance	s_a	0 ... 1.215 mm
Reduction factor r_{Al}		0.3
Reduction factor r_{Cu}		0.2
Reduction factor r_{304}		0.7

Nominal ratings

Nominal voltage	U_o	8.2 V (R_i approx. 1 k Ω)
Switching frequency	f	0 ... 2000 Hz
Hysteresis	H	1 ... 10 typ. 3 %
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		≥ 3 mA
Measuring plate detected		≤ 1 mA
Switching state indicator		LED, yellow

Functional safety related parameters

MTTF _d	3590 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	0.14 mm ²
Housing material	Stainless steel 1.4305 / AISI 303
Sensing face	LCP
Degree of protection	IP67

General information

Use in the hazardous area	see instruction manuals
Category	1G; 2G; 3G; 1D

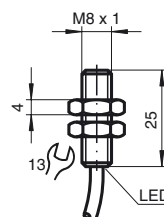
Compliance with standards and directives

Standard conformity	
NAMUR	EN 60947-5-6:2000 IEC 60947-5-6:1999
Standards	EN 60947-5-2:2007 IEC 60947-5-2:2007

Approvals and certificates

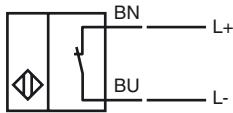
FM approval	
Control drawing	116-0165F
UL approval	cULus Listed, General Purpose
CSA approval	cCSAus Listed, General Purpose
CCC approval	CCC approval / marking not required for products rated ≤ 36 V

Dimensions





Electrical Connection



ATEX 1G

Instruction

Device category 1G

EC-Type Examination Certificate

CE marking

ATEX marking

Directive conformity

Standards

Appropriate type

Effective internal capacitance C_i Effective internal inductance L_i

General

Ambient temperature

Installation, commissioning

Maintenance

Special conditions

Protection from mechanical danger

Electrostatic charge

Manual electrical apparatus for hazardous areas

for use in hazardous areas with gas, vapour and mist

PTB 00 ATEX 2048 X

CE 0102

II 1G Ex ia IIC T6...T1 Ga

94/9/EG

EN 60079-0:2012, EN 60079-11:2012, EN 60079-26:2007

Ignition protection "Intrinsic safety"

Use is restricted to the following stated conditions

NCB1,5...M...N0...

 ≤ 90 nF ; a cable length of 10 m is considered. ≤ 100 μ H ; a cable length of 10 m is considered.

The apparatus has to be operated according to the appropriate data in the data sheet and in this instruction manual.

The EC-Type Examination Certificate has to be observed. The special conditions must be adhered to!

Directive 94/9/EG and hence also EC-Type Examination Certificates apply in general only to the use of electrical apparatus under atmospheric conditions.

The use in ambient temperatures of > 60 °C was tested with regard to hot surfaces by the mentioned certification authority.

If the equipment is not used under atmospheric conditions, a reduction of the permissible minimum ignition energies may have to be taken into consideration.

The temperature ranges, according to temperature class, are given in the EC-Type Examination Certificate. Note: Use the temperature table for category 1 !!! The 20 % reduction in accordance with EN 1127-1:2007 has already been accounted for in the temperature table for category 1.

Laws and/or regulations and standards governing the use or intended usage goal must be observed.

The intrinsic safety is only assured in connection with an appropriate related apparatus and according to the proof of intrinsic safety.

The associated apparatus must satisfy the requirements of category ia.

Due to the possible danger of ignition, which can arise due to faults and/or transient currents in the equipotential bonding system, galvanic isolation of the power supply and signal circuit is preferable. Associated apparatus without electrical isolation must only be used if the appropriate requirements of IEC 60079-14 are met.

No changes can be made to apparatus, which are operated in hazardous areas. Repairs to these apparatus are not possible.

When used in the temperature range below -20 °C the sensor should be protected from knocks by the provision of an additional housing.

Electrostatic charges must be avoided on the mechanical housing components. Dangerous electrostatic charges on the mechanical housing components can be avoided by incorporating these in the equipotential bonding.

ATEX 2G

Instruction

Device category 2G

EC-Type Examination Certificate

CE marking

ATEX marking

Directive conformity

Standards

Appropriate type

Effective internal capacitance C_i

Effective internal inductance L_i

General

Ambient temperature

Installation, commissioning

Maintenance

Special conditions

Protection from mechanical danger

Electrostatic charge

Manual electrical apparatus for hazardous areas

for use in hazardous areas with gas, vapour and mist

PTB 00 ATEX 2048 X

CE 0102

II 1G Ex ia IIC T6...T1 Ga

94/9/EG

EN 60079-0:2012, EN 60079-11:2012

Ignition protection "Intrinsic safety"

Use is restricted to the following stated conditions

NCB1,5...M...N0...

≤ 90 nF ; a cable length of 10 m is considered.

≤ 100 μ H ; a cable length of 10 m is considered.

The apparatus has to be operated according to the appropriate data in the data sheet and in this instruction manual. The EC-Type Examination Certificate has to be observed. The special conditions must be adhered to!

Directive 94/9/EG and hence also EC-Type Examination Certificates apply in general only to the use of electrical apparatus under atmospheric conditions.

The use in ambient temperatures of > 60 °C was tested with regard to hot surfaces by the mentioned certification authority.

If the equipment is not used under atmospheric conditions, a reduction of the permissible minimum ignition energies may have to be taken into consideration.

The temperature ranges, according to temperature class, are given in the EC-Type Examination Certificate.

Laws and/or regulations and standards governing the use or intended usage goal must be observed. The intrinsic safety is only assured in connection with an appropriate related apparatus and according to the proof of intrinsic safety.

No changes can be made to apparatus, which are operated in hazardous areas. Repairs to these apparatus are not possible.

When used in the temperature range below -20 °C the sensor should be protected from knocks by the provision of an additional housing.

Electrostatic charges must be avoided on the mechanical housing components. Dangerous electrostatic charges on the mechanical housing components can be avoided by incorporating these in the equipotential bonding.

ATEX 3G (nL)

Note

This instruction is only valid for products according to EN 60079-15:2003, valid until 31-May-2008

Instruction**Manual electrical apparatus for hazardous areas****Device category 3G (nL)**

for use in hazardous areas with gas, vapour and mist

CE marking

CE 0102

ATEX marking

II 3G Ex nL IIC T6 X

Directive conformity

94/9/EG

Standard conformity

EN 60079-15:2005 Ignition protection category "n"
Use is restricted to the following stated conditions

Effective internal capacitance C_i

$\leq 90 \text{ nF}$; a cable length of 10 m is considered.

Effective internal inductance L_i

$\leq 100 \text{ }\mu\text{H}$; 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!

Installation, commissioning

Laws and/or regulations and standards governing the use or intended usage goal must be observed. The sensor must only be operated with an energy-limited circuit, which satisfies the requirements of IEC 60079-15. The explosion group complies with the connected, supplying, power limiting circuit.

Maintenance

No changes can be made to apparatus, which are operated in hazardous areas. Repairs to these apparatus are not possible.

Special conditions

Maximum permissible ambient temperature T_{Umax} at $U_i = 20 \text{ V}$

for $P_i=34 \text{ mW}$, $I_i=25 \text{ mA}$, T6

55 °C (131 °F)

for $P_i=34 \text{ mW}$, $I_i=25 \text{ mA}$, T5

55 °C (131 °F)

for $P_i=34 \text{ mW}$, $I_i=25 \text{ mA}$, T4-T1

55 °C (131 °F)

for $P_i=64 \text{ mW}$, $I_i=25 \text{ mA}$, T6

55 °C (131 °F)

for $P_i=64 \text{ mW}$, $I_i=25 \text{ mA}$, T5

55 °C (131 °F)

for $P_i=64 \text{ mW}$, $I_i=25 \text{ mA}$, T4-T1

55 °C (131 °F)

for $P_i=169 \text{ mW}$, $I_i=52 \text{ mA}$, T6

41 °C (105.8 °F)

for $P_i=169 \text{ mW}$, $I_i=52 \text{ mA}$, T5

41 °C (105.8 °F)

for $P_i=169 \text{ mW}$, $I_i=52 \text{ mA}$, T4-T1

41 °C (105.8 °F)

for $P_i=242 \text{ mW}$, $I_i=76 \text{ mA}$, T6

29 °C (84.2 °F)

for $P_i=242 \text{ mW}$, $I_i=76 \text{ mA}$, T5

29 °C (84.2 °F)

for $P_i=242 \text{ mW}$, $I_i=76 \text{ mA}$, T4-T1

29 °C (84.2 °F)

Protection from mechanical danger

The sensor must not be exposed to **ANY FORM** of mechanical danger. When used in the temperature range below -20 °C the sensor should be protected from knocks by the provision of an additional housing.

Protection from UV light

The sensor and the connection cable must be protected from damaging UV-radiation. This can be achieved when the sensor is used in internal areas.

Protection of the connection cable

The connection cable must be prevented from being subjected to tension and torsional loading.

Electrostatic charge

Electrostatic charges must be avoided on the mechanical housing components. Dangerous electrostatic charges on the mechanical housing components can be avoided by incorporating these in the equipotential bonding.

Connection parts

The connection parts are to be installed, such that a minimum protection class of IP20 is achieved, in accordance with IEC 60529.

ATEX 3G (ic)

Instruction

Device category 3G (ic)

Certificate of Compliance

CE marking

ATEX marking

Directive conformity

Standards

Effective internal capacitance C_i Effective internal inductance L_i

General

Installation, commissioning

Maintenance

Special conditionsMaximum permissible ambient temperature T_{Umax} at $U_i = 20\text{ V}$ for $P_i=34\text{ mW}$, $I_i=25\text{ mA}$, T6for $P_i=34\text{ mW}$, $I_i=25\text{ mA}$, T5for $P_i=34\text{ mW}$, $I_i=25\text{ mA}$, T4-T1for $P_i=64\text{ mW}$, $I_i=25\text{ mA}$, T6for $P_i=64\text{ mW}$, $I_i=25\text{ mA}$, T5for $P_i=64\text{ mW}$, $I_i=25\text{ mA}$, T4-T1for $P_i=169\text{ mW}$, $I_i=52\text{ mA}$, T6for $P_i=169\text{ mW}$, $I_i=52\text{ mA}$, T5for $P_i=169\text{ mW}$, $I_i=52\text{ mA}$, T4-T1for $P_i=242\text{ mW}$, $I_i=76\text{ mA}$, T6for $P_i=242\text{ mW}$, $I_i=76\text{ mA}$, T5for $P_i=242\text{ mW}$, $I_i=76\text{ mA}$, T4-T1

Protection from mechanical danger

Electrostatic charge

Connection parts

Manual electrical apparatus for hazardous areas

for use in hazardous areas with gas, vapour and mist

PF 13 CERT 2895 X



II 3G Ex ic IIC T6...T1 Gc

94/9/EG

EN 60079-0:2012, EN 60079-11:2012 Ignition protection category "ic"

Use is restricted to the following stated conditions

 $\leq 90\text{ nF}$; a cable length of 10 m is considered. $\leq 100\text{ }\mu\text{H}$; A cable length of 10 m is considered.

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!

Laws and/or regulations and standards governing the use or intended usage goal must be observed. The sensor must only be operated with energy-limited circuits, which satisfy the requirements of IEC 60079-11. The explosion group depends on the connected and energy-limited supply circuit.

No changes can be made to apparatus, which are operated in hazardous areas.

Repairs to these apparatus are not possible.

55 °C (131 °F)

55 °C (131 °F)

55 °C (131 °F)

55 °C (131 °F)

55 °C (131 °F)

55 °C (131 °F)

41 °C (105.8 °F)

41 °C (105.8 °F)

41 °C (105.8 °F)

29 °C (84.2 °F)

29 °C (84.2 °F)

29 °C (84.2 °F)

The sensor must not be mechanically damaged.

When used in the temperature range below -20 °C the sensor should be protected from knocks by the provision of an additional housing.

Electrostatic charges must be avoided on the mechanical housing components. Dangerous electrostatic charges on the mechanical housing components can be avoided by incorporating these in the equipotential bonding.

The connection parts are to be installed, such that a minimum protection class of IP20 is achieved, in accordance with IEC 60529.

ATEX 1D

Instruction

Device category 1D

EC-Type Examination Certificate

CE marking

ATEX marking

Directive conformity

Standards

Appropriate type

Effective internal capacitance C_i Effective internal inductance L_i

General

Maximum housing surface temperature

Installation, commissioning

Maintenance

Special conditions

Electrostatic charge

Manual electrical apparatus for hazardous areas

for use in hazardous areas with combustible dust

ZELM 03 ATEX 0128 X

CE 0102

Ex II 1D Ex iaD 20 T 108 °C (226.4 °F)

94/9/EG

IEC 61241-11:2002: draft; prEN61241-0:2002

type of protection intrinsic safety "iD"

Use is restricted to the following stated conditions

NCB1,5...M...N0...

≤ 90 nF ; a cable length of 10 m is considered.

≤ 100 μH ; a cable length of 10 m is considered.

The apparatus has to be operated according to the appropriate data in the data sheet and in this instruction manual.

The EC-Type Examination Certificate has to be observed.

The special conditions must be adhered to!

The maximum surface temperature of the housing is given in the EC-Type Examination Certificate.

Laws and/or regulations and standards governing the use or intended usage goal must be observed.

The intrinsic safety is only assured in connection with an appropriate related apparatus and according to the proof of intrinsic safety.

The associated apparatus must satisfy at least the requirements of category ia IIB or iaD. Because of the possibility of the danger of ignition, which can arise due to faults and/or transient currents in the equipotential bonding system, galvanic isolation in the power supply and signal circuits is preferable. Associated apparatus without electrical isolation must only be used if the appropriate requirements of IEC 60079-14 are met.

The intrinsically safe circuit has to be protected against influences due to lightning.

When used in the isolating wall between Zone 20 and Zone 21 or Zone 21 und Zone 22 the sensor must not be exposed to any mechanical danger and must be sealed in such a way, that the protective function of the isolating wall is not impaired. The applicable directives and standards must be observed.

No changes can be made to apparatus, which are operated in hazardous areas.

Repairs to these apparatus are not possible.

Electrostatic charges must be avoided on the mechanical housing components.

Dangerous electrostatic charges on the mechanical housing components can be avoided by incorporating these in the equipotential bonding.

The connection cables are to be laid in accordance with EN 50281-1-2 and must not normally be subjected to chaffing during use.