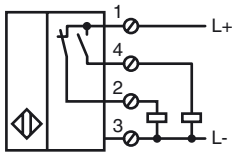
Model Number

NCB40-FP-A2-P1-3G-3D

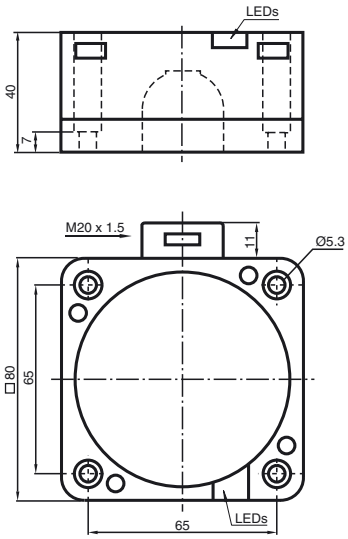
Features

- **40 mm flush**
- **4-wire DC**

Connection



Dimensions



Technical Data

General specifications		
Switching element function		PNP NO/NC
Rated operating distance	s_n	40 mm
Installation		flush
Output polarity		DC
Assured operating distance	s_a	0 ... 32.4 mm
Reduction factor r_{Al}		0.25
Reduction factor r_{Cu}		0.23
Reduction factor r_{304}		0.85
Nominal ratings		
Operating voltage	U_B	10 ... 60 V DC
Switching frequency	f	0 ... 80 Hz
Hysteresis	H	typ. 3 %
Reverse polarity protection		reverse polarity protected
Voltage drop	U_d	≤ 3 V
Operating current	I_L	0 ... 200 mA
Off-state current	I_r	0 ... 0.5 mA
No-load supply current	I_0	≤ 20 mA
Time delay before availability	t_v	≤ 300 ms
Operating voltage display		LED, green
Indication of the switching state		LED, yellow
Functional safety related parameters		
$MTTF_d$		630 a
Mission Time (T_M)		20 a
Diagnostic Coverage (DC)		0 %
Ambient conditions		
Ambient temperature		-25 ... 70 °C (-13 ... 158 °F)
Mechanical specifications		
Connection type		screw terminals
Core cross-section		up to 2.5 mm^2
Housing material		PBT
Sensing face		PBT
Housing base		PBT
Protection degree		IP68
General information		
Use in the hazardous area		see instruction manuals
Category		3G; 3D
Compliance with standards and directives		
Standard conformity		
Standards		EN 60947-5-2:2007 IEC 60947-5-2:2007
Approvals and certificates		
UL approval		cULus Listed, General Purpose
CSA approval		cCSAus Listed, General Purpose
CCC approval		Certified by China Compulsory Certification (CCC)

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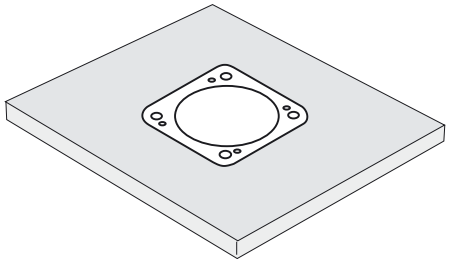
Installation hint

These sensors are especially designed for embeddable mounting in conveyor floors. Due to its precise location in metal base plates the sensor is afforded a high degree of mechanical protection. No clearance is required between the sensor and the base plate, avoiding the need for protective guarding to prevent possible foot injury.

The large sensing range ensures positive detection, and thus provides consistent control and monitoring of the conveyor.



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ATEX 3G (nA)

Instruction	**Manual electrical apparatus for hazardous areas**
Device category 3G (nA)	for use in hazardous areas with gas, vapour and mist
Directive conformity	94/9/EG
Standard conformity	EN 60079-0:2006, EN 60079-15:2005 Ignition protection category "n" Use is restricted to the following stated conditions
CE symbol	CE
Ex-identification	Ex II 3G Ex nA IIC T6 X
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, Comissioning	Laws and/or regulations and standards governing the use or intended usage goal must be observed.
Maintenance	No changes can be made to apparatus, which are operated in hazardous areas. Repairs to these apparatus are not possible.

Special conditions

Maximum operating current I_L	The maximum permissible load current must be restricted to the values given in the following list. High load currents and load short-circuits are not permitted.
Maximum operating voltage U_{Bmax}	The maximum permissible operating voltage UB max is restricted to the values in the following list. Tolerances are not permissible.
Maximum permissible ambient temperature T_{Umax}	dependant of the load current I_L and the max. operating voltage $U_{Bmax.}$ Information can be taken from the following list.
at U_{Bmax}=60 V, I_L=200 mA	44 °C (111.2 °F)
at U_{Bmax}=60 V, I_L=100 mA	45 °C (113 °F)
at U_{Bmax}=60 V, I_L=50 mA	48 °C (118.4 °F)
at U_{Bmax}=60 V, I_L=25 mA	48 °C (118.4 °F)
at U_{Bmax}=30 V, I_L=200 mA	51 °C (123.8 °F)
at U_{Bmax}=30 V, I_L=100 mA	55 °C (131 °F)
at U_{Bmax}=30 V, I_L=50 mA	56 °C (132.8 °F)
at U_{Bmax}=30 V, I_L=25 mA	57 °C (134.6 °F)
Plug connector	The plug connector must not be disconnected under voltage. The proximity switch is marked as follows: “DO NOT DISCONNECT UNDER VOLTAGE!” When the plug connector is disconnected the ingress of dirt into the inner areas (i.e. the areas, which are not accessible in the plugged-in condition) must be prevented.
Protection from mechanical danger	The sensor must not be exposed to **ANY FORM** of mechanical danger.
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.
Electrostatic charging	When used in group IIC non-permissible electrostatic charges should be avoided on the plastic housing parts. 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.
Connections for external wire	Terminal connection: Minimum conductor cross-section: 0.5 mm^2, maximum conductor cross-section: 2.5 mm^2. The ends of the conductor must be provided with cable sleeves.
Lead insertion	The cable entry must be such, that no tension load or twist is applied to the cable The protection category must be in accordance with EN 60529 and as stated in the data sheet. The cable entry must be designed so that there are no sharp edges to damage the cable and impair the level of protection of the sensor. The cable entry must be in accordance with the relevant European standard for industrial cable and lead entries.. In addition, in the case of flexible leads, the points of entry of the cable must be rounded off over an angle of at least 75°, with a radius (R), which is at least one quarter of the maximum permissible cable diameter for the entry, but not greater than 3 mm.

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ATEX 3D

Note	**This instruction is only valid for products according to EN 50281-1-1, valid until 30-September-2008** Note the ex-marking on the sensor or on the enclosed adhesive label
Instruction	**Manual electrical apparatus for hazardous areas**
Device category 3D	for use in hazardous areas with non-conducting combustible dust
Directive conformity	94/9/EG
Standard conformity	EN 50281-1-1 Protection via housing Use is restricted to the following stated conditions
CE symbol	CE
Ex-identification	Ex II 3D IP67 T 96 °C (204.8 °F) X
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 adhered to!
Installation, Comissioning	Laws and/or regulations and standards governing the use or intended usage goal must be observed.
Maintenance	No changes can be made to apparatus, which are operated in hazardous areas. Repairs to these apparatus are not possible.
Special conditions	
Maximum operating current I_L	The maximum permissible load current must be restricted to the values given in the following list. High load currents and load short-circuits are not permitted.
Maximum operating voltage U_{Bmax}	The maximum permissible operating voltage UBmax must be restricted to the values given in the following list. Tolerances are not permitted.
Maximum heating (Temperature rise)	dependant of the load current I_L and the max. operating voltage $U_{Bmax.}$ Information can be taken from the following list. The maximum surface temperature at maximum ambient temperature is given in the Ex identification of the apparatus.
at U_{Bmax}=60 V, I_L=200 mA	26 K
at U_{Bmax}=60 V, I_L=100 mA	25 K
at U_{Bmax}=60 V, I_L=50 mA	22 K
at U_{Bmax}=60 V, I_L=25 mA	22 K
at U_{Bmax}=30 V, I_L=200 mA	19 K
at U_{Bmax}=30 V, I_L=100 mA	15 K
at U_{Bmax}=30 V, I_L=50 mA	13 K
Plug connector	The plug connector must not be disconnected under voltage. The proximity switch is marked as follows: “DO NOT DISCONNECT UNDER VOLTAGE!” When the plug connector is disconnected the ingress of dirt into the inner areas (i.e. the areas, which are not accessible in the plugged-in condition) must be prevented.
Protection from mechanical danger	The sensor must not be mechanically damaged.
Electrostatic charging	Sliding contact discharges must be avoided. 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.
Connections for external wire	Terminal connection: Minimum conductor cross-section: 0.5 mm^2, maximum conductor cross-section: 2.5 mm^2. The ends of the conductor must be provided with cable sleeves.
Lead insertion	The cable entry must be such, that no tension load or twist is applied to the cable The protection category must be in accordance with EN 60529 and as stated in the data sheet. The cable entry must be designed so that there are no sharp edges to damage the cable and impair the level of protection of the sensor. The cable entry must be in accordance with the relevant European standard for industrial cable and lead entries.. In addition, in the case of flexible leads, the points of entry of the cable must be rounded off over an angle of at least 75°, with a radius (R), which is at least one quarter of the maximum permissible cable diameter for the entry, but not greater than 3 mm.

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ATEX 3D (tD)

Note	**This instruction is only valid for products according to EN 61241-0:2006 and EN 61241-1:2004** Note the ex-marking on the sensor or on the enclosed adhesive label
Instruction	**Manual electrical apparatus for hazardous areas**
Device category 3D	for use in hazardous areas with combustible dust
Directive conformity	94/9/EG
Standard conformity	EN 61241-0:2006, EN 61241-1:2004 Protection via housing "tD" Use is restricted to the following stated conditions
CE symbol	CE
Ex-identification	Ex II 3D Ex tD A22 IP67 T80°C X
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!
Installation, Comissioning	Laws and/or regulations and standards governing the use or intended usage goal must be observed.
Maintenance	No changes can be made to apparatus, which are operated in hazardous areas. Repairs to these apparatus are not possible.

Special conditions

Maximum operating current I_L	The maximum permissible load current must be restricted to the values given in the following list. High load currents and load short-circuits are not permitted.
Maximum operating voltage U_{Bmax}	The maximum permissible operating voltage UBmax must be restricted to the values given in the following list. Tolerances are not permitted.
Maximum permissible ambient temperature T_{Umax}	dependant of the load current I_L and the max. operating voltage $U_{Bmax.}$ Information can be taken from the following list.
at U_{Bmax}=60 V, I_L=200 mA	44 °C (111.2 °F)
at U_{Bmax}=60 V, I_L=100 mA	45 °C (113 °F)
at U_{Bmax}=60 V, I_L=50 mA	48 °C (118.4 °F)
at U_{Bmax}=60 V, I_L=25 mA	48 °C (118.4 °F)
at U_{Bmax}=30 V, I_L=200 mA	51 °C (123.8 °F)
at U_{Bmax}=30 V, I_L=100 mA	55 °C (131 °F)
at U_{Bmax}=30 V, I_L=50 mA	56 °C (132.8 °F)
Plug connector	The plug connector must not be withdrawn under voltage. The proximity switch is identified as follows: "WARNING - DO NOT SEPARATE WHEN ENERGIZED". With the plug connector disconnected, soiling of the internal area must be prevented.(i.e. the area that is inaccessible when the connector is inserted)
Protection from mechanical danger	The sensor must not be exposed to **ANY FORM** of mechanical danger.
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.
Electrostatic charging	Sliding contact discharges must be avoided. 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.
Connections for external wire	Terminal connection: Minimum conductor cross-section: 0.5 mm^2, maximum conductor cross-section: 2.5 mm^2. The ends of the conductor must be provided with cable sleeves.
Lead insertion	The cable entry must be such, that no tension load or twist is applied to the cable The protection category must be in accordance with EN 60529 and as stated in the data sheet. The requirements of EN 61241-0 relating to the cable and lead entries are to be complied with. The special characteristics of the ignition protection class "tD, method A" of the proximity switch must not be disregarded.

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