ICB, M12 - Extra short body version



Proximity inductive sensors with extended range and nickel-plated brass housing





Benefits

- · Sensing distance: 4 to 8 mm
- Flush or non-flush types
- Extra short body versions
- Rated operational voltage (U_b): 10 36 VDC
- Output: DC 200 mA, NPN or PNP
- · Normally open or Normally closed
- LED indication for output ON
- · Protection: reverse polarity, short circuit, transients
- Cable or M12 plug versions
- According to IEC 60947-5-2
- · Laser engraved on front cap, permanently legible
- Extended temperature range of -25°C to +70°C

Description

A family of inductive proximity switches in industrial standard nickel-plated brass housings. They are characterized by extremely high performance in a very small design, to satisfy the most demanding applications, also where the space available for the sensor is limited and extended sensing range is requested.

Output is open collector NPN or PNP transistors.



References

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Code	Option	Description
ICB		Proximity inductive sensors, nickel-plated brass housing
12		Housing size
S		Housing length
23		Thread length
	F	Detection principle: flush mounting
	N	Detection principle: non-flush mounting
	04	Sensing distance: 4mm
	80	Sensing distance: 8mm
	M1	M12 plug
	A2	2 m PVC cable
	N	Output type: NPN
	Р	Output type: PNP
	0	Output configuration: normally open
	С	Output configuration: normally closed

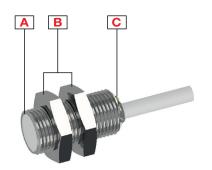
Selection guide

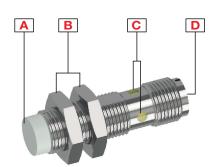
Con- nec-	Rated operating	Ordering no. NPN,	Ordering no. PNP,	Ordering no. NPN,	Ordering no. PNP,
tion	distance Sn	Normally open	Normally open	Normally closed	Normally closed
Cable	4 mm 1)	ICB12S23F04A2NO	ICB12S23F04A2PO	ICB12S23F04A2NC	ICB12S23F04A2PC
Cable	8 mm ²⁾	ICB12S23N08A2NO	ICB12S23N08A2PO	ICB12S23N08A2NC	ICB12S23N08A2PC
Plug	4 mm 1)	ICB12S23F04M1NO	ICB12S23F04M1PO	ICB12S23F04M1NC	ICB12S23F04M1PC
Plug	8 mm ²⁾	ICB12S23N08M1NO	ICB12S23N08M1PO	ICB12S23N08M1NC	ICB12S23N08M1PC

¹⁾ For flush mounting in metal ²⁾ For non-flush mounting in metal



Structure







Element	Component	Function
Α	Sensing face	Flush or non-flush
В	2 nuts	For sensor mounting
С	LED	Yellow LED: Output flashing: short circuit or overload indication
D	M12 x 1, 4 pin, male connector	For plug versions only



Sensing



Detection

Assured operating sensing distance (S _a)	$0 \le S_a \le 0.81 \times S_n$
Effective operating distance (S _r)	$0.9 \times S_n \le S_r \le 1.1 \times S_n$
Usable operating distance (S _u)	$0.9 \times S_r \le S_u \le 1.1 \times S_r$
Differential travel (H)	
(Hysteresis)	1 to 20% of sensing dist.

Correction factors

The specific operating distance S_n refers to defined measuring conditions. The following data have to be considered as general guidelines.

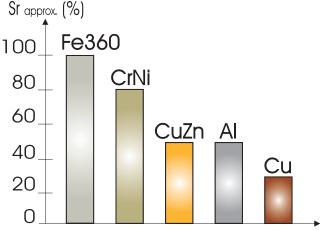


Fig. 1 The rated operating distance is reduced by the use of metals and alloys other than Fe360. The most important reduction factors for inductive proximity sensors are shown in the figure.

Fe360: steel

CrNi: chrome-nickel

CuZn: brass Al: aluminium Cu: copper

Sr: effective operating distance

Accuracy

Repeat accuracy (R)	≤ 10%



Features



Power Supply

Rated operational voltage (U _b)	10 to 36 VDC (ripple incl.)
Ripple (U _{rpp})	≤ 10%
No load supply current (I _o)	≤ 16 mA
Power ON delay (t _v)	≤ 40 ms



Outputs

Output current (I _e)	≤ 200 mA
OFF-state current (I,)	≤ 50 µA
Voltage drop (U _d)	Max. 2.5 VDC @ 200 mA
Protection	Reverse polarity, short-circuit, transients
Voltage transient	1 kV/0.5 J



Response times

Max. operating frequency (f)	≤ 2000 Hz



Indication

Indication for output ON NO version NC version	Activated LED, yellow Target present Target not present
Indication for short circuit/ overload	LED blinking (f = 2 Hz)



Environmental

Ambient temperature	
Operating	-25° to +70°C (-13° to +158°F)
Storage	-25° to +80°C (-13° to +176°F)
Shock and vibration	IEC 60947-5-2/7.4
Degree of protection	IP67



Compatibility and conformity

EMC protection - According to IEC 60947-5-2		
Electrostatic discharge (ESD)	IEC 61000-4-2 8 kV air discharge, 4 kV contact discharge	
Radiated radio frequency	IEC 61000-4-3 3 V/m	
Burst immunity	IEC 61000-4-4 2 kV	
Conducted radio frequency	IEC 61000-4-6 3 V	
Power frequency magnetic fields	IEC 61000-4-8 30 A/m	

MTTF	3090 years @ 50°C (122°F)

Approvals	
	CCC is not required for products rated ≤ 36 V

Mechanical data

Weight (cable/nuts included)	Max. 68 g
Mounting	Flush or non flush mountable
Material	Body: nickel-plated brass
iviaterial	Front: grey thermoplastic polyester
Tightening torque	10 Nm



Electrical connection

Cable	Ø 4.1 x 2 m, 3 x 0.25 mm², grey PVC, oil proof
Plug	M12 x 1



Connection Diagrams

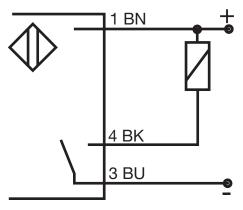


Fig. 2 NPN - Normally open

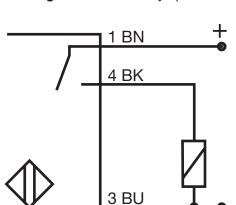


Fig. 4 PNP - Normally open

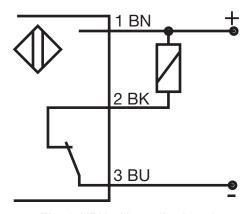


Fig. 3 NPN - Normally closed

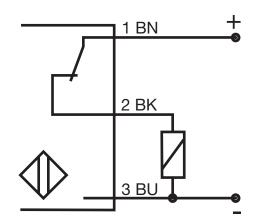


Fig. 5 PNP - Normally closed

Colour code				
BN: brown	BK: black	BU: blue		



Dimensions

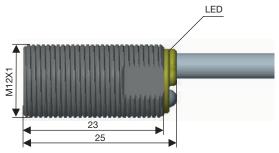


Fig. 6 Short body, flush version, cable

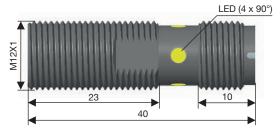


Fig. 8 Short body, flush version, plug



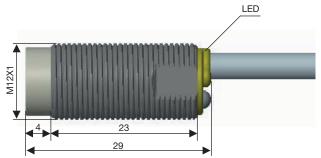


Fig. 7 Short body, non-flush version, cable

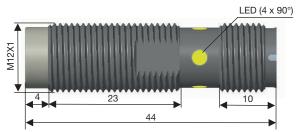
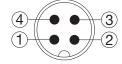


Fig. 9 Short body, non-flush version, plug





Installation

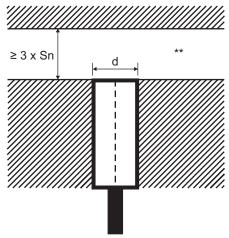


Fig. 10 Flush sensor, when installed in damping material

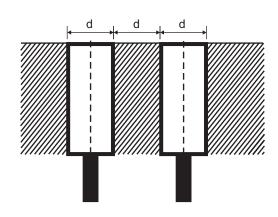


Fig. 11 Flush sensors, when installed together in damping material

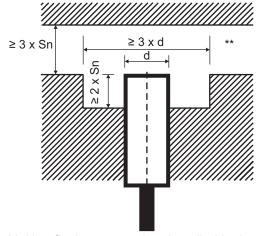


Fig. 12 Non-flush sensor, when installed in damping material

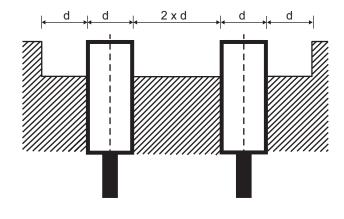


Fig. 13 Non-flush sensors, when installed together in damping material

S_n: nominal sensing distance d: sensor diameter: 12 mm

^{**} Free zone or non-damping material