

# Inductive sensor

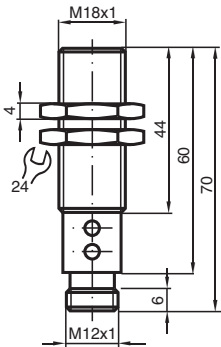
## NCB5-18GM60-B3B-V1



- Comfort series
- A/B node with extended addressing possibility for up to 62 nodes
- Cylindrical
- NO/NC selectable
- Pre-fault message
- Installation help
- On/Off delay (disconnectable)
- Oscillator monitoring



### Dimensions



### Technical Data

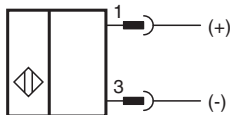
General specifications		
Switching function		Normally open/closed (NO/NC) programmable
Output type		AS-Interface
Rated operating distance	$s_n$	5 mm
Installation		flush
Assured operating distance	$s_a$	0 ... 4.05 mm
Actual operating distance	$s_r$	4.5 ... 5.5 mm typ. 5 mm
Reduction factor $r_{AI}$		0.2
Reduction factor $r_{Cu}$		0.15
Reduction factor $r_{304}$		0.62
Node type		A/B node
AS-Interface specification		V3.0
Required gateway specification		$\geq$ V2.1
Output type		2-wire
Nominal ratings		
Operating voltage	$U_B$	26.5 ... 31.9 V via AS-i bus system
Switching frequency	$f$	0 ... 100 Hz

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## Technical Data

Hysteresis	H	1 ... 15 % typ. 5 %
Reverse polarity protection		reverse polarity protected
Voltage drop at $I_L$		
Voltage drop $I_L = 20$ mA, switching element on	$U_d$	3.4 ... 5 V typ. 4.3 V
No-load supply current	$I_0$	$\leq 25$ mA
Time delay before availability	$t_v$	$\leq 1000$ ms
Operating voltage indicator		dual-LED, green
Switching state indicator		dual-LED, yellow
Error indicator		dual-LED, red
<b>Functional safety related parameters</b>		
MTTF <sub>d</sub>		926 a
Mission Time ( $T_M$ )		20 a
Diagnostic Coverage (DC)		0 %
<b>Compliance with standards and directives</b>		
Standard conformity		
Electromagnetic compatibility		EN 50295:1999-10
Standards		EN IEC 60947-5-2
<b>Approvals and certificates</b>		
UL approval		cULus Listed, General Purpose
CCC approval		CCC approval / marking not required for products rated $\leq 36$ V
<b>Ambient conditions</b>		
Ambient temperature		-25 ... 70 °C (-13 ... 158 °F)
Storage temperature		-40 ... 85 °C (-40 ... 185 °F)
<b>Mechanical specifications</b>		
Connection type		Connector plug
Housing material		Stainless steel 1.4305 / AISI 303
Sensing face		PBT
Degree of protection		IP67
Connector		
Threading		M12 x 1
Number of pins		4
Dimensions		
Length		70 mm
Diameter		18 mm

## Connection



## Connection Assignment



## Additional Information

### Programming Instructions

Address 00	preset, alterable via Busmaster or programming units
IO-Code	0
ID-Code	A
ID1-Code	7
ID2-Code	E

### Data bit

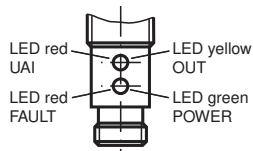
Bit	Function
D0	Switching state
D1	Prefailure message (dynamic)
D2	Oscillator monitoring
D3	Object too close

### Parameter bit

Bit	Function
P0	ON / Off delay activated* / deactivated
P1	Switching element function NO* / NC
P2	not used
P3	not used

\*Standard setting

### Indicators



## Additional Information

### Indication depending on the distance to the object and switching element function (P1)

Distance to the object	Function	Parameter P1	yellow LED (OUT)	red LED (UAI)	Data bit D0	Data bit D3
$> 1.2 S_n$	NO	1	off	off	0	1
$1 S_n - 1.2 S_n$		1	off	flashing	0	1
$0.8 S_n - 1 S_n$		1	flashing	flashing	1	1
$0.1 S_n - 0.8 S_n$		1	on	off	1	1
$0 S_n - 0.1 S_n$		1	flashing	flashing	1	0
$> 1,2 S_n$	NC	0	on	off	1	1
$1 S_n - 1.2 S_n$		0	flashing	flashing	1	1
$0.8 S_n - 1 S_n$		0	off	flashing	0	1
$0.1 S_n - 0.8 S_n$		0	off	off	0	1
$0 S_n - 0.1 S_n$		0	off	flashing	1	0

### Indication depending on the operation mode

Symptoms	green LED (POWER)	red LED (FAULT)	Data bit D2
normal operation	on	off	1
oscillator defect	flashing	flashing	0*
no communication	off	on	1

\*: D0, D1, D3 will be set to 0

### Dynamic pre-fault indication:

While normal operation  $D1=1$ . If the switch is damped critically, i.e. the object has passed uncompletely the unsafe sensing range of  $0.8 S_n - 1.2 s_n$  during damping, changes  $D1$  to 0 and signals that an adjustment is necessary. See the following diagram:

### Monitoring "object too near":

$D3$  serves as signalling: Object too near too the sensor, danger of damage, adjustment necessary. In normal mode  $D3=1$ . If the object reaches the  $0 - 0.1 s_n$  range,  $D3=0$ . If the object leaves this range,  $D3=1$ .

### On/off delay:

The on/off delay is preset and switched on ( $P0=1$ ). On delay approx. 15 ms, when  $P0=1$  and NO function ( $P1=1$ ). Off delay approx. 15 ms, when  $P0=1$  and NC function ( $P1=0$ ).