

# Inductive sensor

## NSN4-12GM45-2E2-V1-S2D2



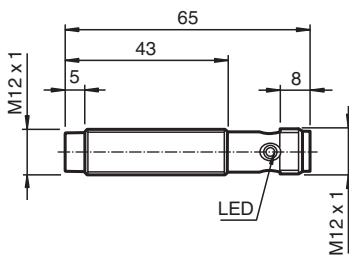
- No unusable area
- 4 mm non-flush
- Use of standard metallic actuating surfaces
- Applications up to Cat. 2, PLd/SIL 2 possible (can be used redundantly up to Cat. 3, PLe/SIL 3)
- LED for switching state and fault indication
- Safety outputs OSSD
- TÜV certified



### Function

The inductive safety sensors are TÜV-certified in accordance with the EU Machinery Directive, Performance Level PLd, Category 2, and SIL2. They are used to safeguard machines and plant components, as well as for reliable position detection in this environment. With their OSSD interface for reliable, redundant shutdown of electronic outputs, they enable easy connection to a safety PLC or fail-safe control interfaces. They can also be operated as standard sensors. The sensors reliably detect standard metal objects in front of the sensor face without coding or similar; there is no blind zone. High characteristic safety values allow longer testing intervals than comparable solutions with a microcontroller. 2 sensors can be connected with 2-channel redundancy and allow PLe as a Category 3 solution.

### Dimensions



### Technical Data

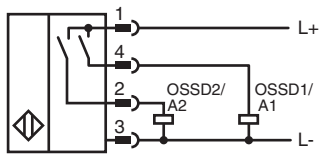
General specifications		
Switching function		2 x normally open (NO)
Output type		PNP
Rated operating distance	$s_n$	4 mm
Installation		non-flush
Output polarity		DC
Assured operating distance	$s_a$	0 ... 3.24 mm
Actuating element		Reference target according EN IEC 60947-5-2 (FE360 - ST37K) 12 mm x 12 mm x 1 mm
Reduction factor $r_{Al}$		0.55
Reduction factor $r_{Cu}$		0.5
Reduction factor $r_{304}$		0.9
Reduction factor $r_{Brass}$		0.6
Output type		4-wire
Nominal ratings		
Operating voltage	$U_B$	18 ... 30 V
Rated operating voltage	$U_e$	24 V
Switching frequency	$f$	0 ... 30 Hz

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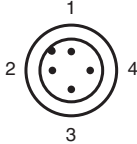
## Technical Data

Hysteresis	H	typ. 5%
Reverse polarity protection		reverse polarity protected
Short-circuit protection		pulsing
Overload resistance		yes
Voltage drop	$U_d$	$\leq 3$ V at $I_L$ (sum of all outputs) max. 50 mA
Rated insulation voltage	$U_{BIS}$	30 V
Operating current	$I_L$	1 ... 30 mA per output
Off-state current	$I_r$	0 ... 0.5 mA
No-load supply current	$I_0$	$\leq 15$ mA
Time delay before availability	$t_v$	$\leq 300$ ms
Switching state indicator		LED, yellow
Error indicator		LED, red
<b>Functional safety related parameters</b>		
Safety Integrity Level (SIL)		SIL 2
Performance level (PL)		PL d
Category		Cat. 2
MTTF <sub>d</sub>		> 7500 a
Mission Time (T <sub>M</sub> )		20 a
Diagnostic Coverage (DC)		min. 60 %
Assured release distance of a PDDB	$S_{ar}$	6 mm
<b>Compliance with standards and directives</b>		
Standard conformity		
Standards		EN IEC 60947-5-2:2007 EN IEC 60947-5-3:2013 EN ISO 13849-1:2015 EN IEC 61508:2010 EN 62061:2005+AC:2010+A1:2013+A2:2015 compatible with EN ISO 61131-2:2007 Typ 1, 2, 3
<b>Approvals and certificates</b>		
UL approval		cULus Listed, General Purpose, Class 2 Power Source
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)
Altitude		$\leq 2000$ m above MSL
<b>Mechanical specifications</b>		
Connection type		Connector plug
Housing material		brass, nickel-plated
Sensing face		PBT
Degree of protection		IP68 / IP69
Connector		
Threading		M12 x 1
Number of pins		4
Mass		18 g
Dimensions		
Length		65 mm
Diameter		12 mm
<b>General information</b>		
Scope of delivery		2 self locking nuts in scope of delivery

## Connection



## Connection Assignment



Wire colors in accordance with EN 60947-5-2

1	BN	(brown)
2	WH	(white)
3	BU	(blue)
4	BK	(black)

## Commissioning

### Note for Setting the Safety Control

The sensor has a self-monitoring function for the outputs. Therefore, to avoid any malfunctions of the sensor, deactivate all test pulses of the connected safety controller to the sensor.