

en 02-2010/03 50110220



**M12**  
2 mm  
4 mm  
6 mm



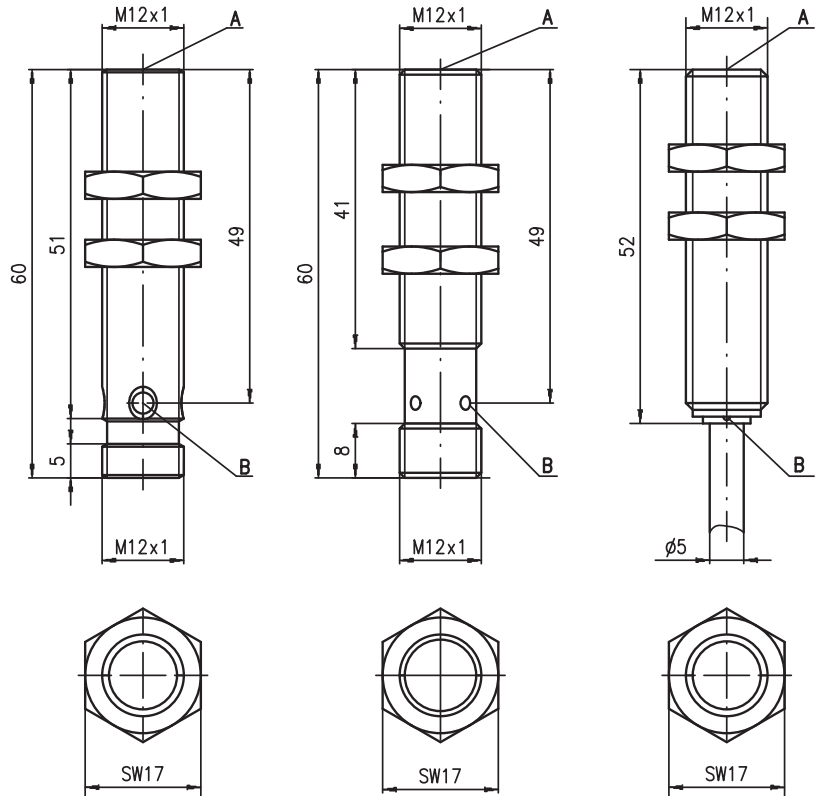
**Embedded**

- Slim and short cylindrical metal housing M12
- Chromium-plated brass housing
- Built-in short circuit protection, inductive protection and polarity reversal protection
- LED for switching state visible from 360°

**Dimensioned drawing**

**IS 212...-2E0-S12**  
**IS 212...-4E0-S12**

**IS 212...-6E0-S12**

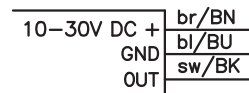


**Tightening torque of the fastening nuts < 10Nm !**

- A** Active surface
- B** Yellow indicator diode

**Electrical connection**

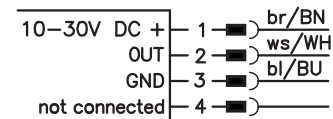
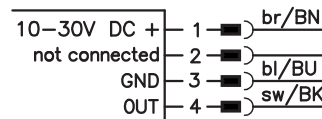
Cable



M12 connector

...NO... (normally open)

...NC... (normally closed)



...NO...-S12 (normally open):  
...NC...-S12 (normally closed):

3-pin or 4-pin M12 connection cables can be used.  
**only** 4-pin M12 connection cables can be used.

We reserve the right to make changes • DS\_IS\_212\_E\_en.fm



**Accessories:**

(available separately)

- M12 connectors (KD ... )
- Ready-made cables (K-D ...)
- Mounting clamp (MC 012...)

## Specifications

### General specifications

	IS 212...-2E0...	IS 212...-4E0...	IS 212...-6E0...
Type of installation	embedded installation		
Typ. operating range limit $S_n$	2.0mm	4.0mm	6.0mm
Operating range $S_a$	0 ... 1.6mm	0 ... 3.2mm	0 ... 4.8mm

### Electrical data

Operating voltage $U_B$ <sup>1)</sup>	10 ... 30VDC		
Residual ripple $\sigma$	$\leq 20\%$ of $U_B$		
Output current $I_L$	$\leq 200\text{mA}$		
Open-circuit current $I_0$	$\leq 10\text{mA}$		
Residual current $I_r$	$\leq 100\mu\text{A}$		
Switching output/function	.../4NO...	PNP transistor, make-contact (NO)	
	.../4NC...	PNP transistor, break-contact (NC)	
	.../2NO...	NPN transistor, make-contact (NO)	
	.../2NC...	NPN transistor, break-contact (NC)	
Voltage drop $U_d$	$\leq 2\text{V}$		
Hysteresis H of $S_r$	$\leq 10\%$	$\leq 15\%$	$\leq 10\%$
Temperature drift of $S_r$	$\leq 10\%$ <sup>2)</sup>		
Repeatability	$\leq 5\%$ <sup>3)</sup>		

### Timing

Switching frequency f	3kHz	2kHz	800Hz
Delay before start-up	$\leq 10\text{ms}$	$\leq 300\text{ms}$	$\leq 50\text{ms}$

### Indicators

Yellow LED (visible from 360°)	switching state
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### Mechanical data

Housing	chromium-plated brass		
Standard surface plate	12 x 12mm <sup>2</sup> , Fe360	12 x 12mm <sup>2</sup> , Fe360	18 x 18mm <sup>2</sup> , Fe360
Active surface	PBTP		
Weight (M12 plug/cable)	approx. 25g/ approx. 95g		
Connection type	M12 connector 4-pin or cable: 2m, PVC, 3 x 0.34mm <sup>2</sup> , $\varnothing$ 5.0mm		

### Environmental data

Ambient temperature	-25°C ... +70°C		
Protection class	IP 67		
Protective circuit <sup>4)</sup>	1, 2, 3		
Standards applied	IEC/EN 60947-5-2		
Electromagnetic compatibility	IEC 60255-5	1kV	
	IEC 61000-4-2	Level 3 air 8kV (ESD)	
	IEC 61000-4-3	Level 3 10V/m (RFI)	
	IEC 61000-4-4	Level 3 2kV (Burst)	

- 1) Observe the safety regulations and installation instructions regarding power supply and wiring; for UL applications: only for use in "Class 2" circuits acc. to NEC
- 2) Over the entire operating temperature range
- 3) For  $U_B = 20 \dots 30\text{VDC}$ , ambient temperature  $T_a = 23^\circ\text{C} \pm 5^\circ\text{C}$
- 4) 1=polarity reversal protection, 2=short circuit protection, 3=inductive protection for all outputs

## Order guide

The sensors listed here are preferred types; current information at [www.leuze.com](http://www.leuze.com).

$S_n$	Designation	Part No.
$S_n = 2\text{mm}$	IS 212 MM/4NO-2E0	50109664
	IS 212 MM/4NO-2E0-S12	50109665
	IS 212 MM/4NC-2E0-S12	50111870
	IS 212 MM/2NO-2E0	50109666
$S_n = 4\text{mm}$	IS 212 MM/4NO-4E0	50109672
	IS 212 MM/4NO-4E0-S12	50109673
	IS 212 MM/4NC-4E0-S12	50109674
	IS 212 MM/2NO-4E0	50109675
	IS 212 MM/2NO-4E0	50109675
$S_n = 6\text{mm}$	IS 212 MM/4NO-6E0	50109678
	IS 212 MM/2NO-6E0	50109682

## Tables

### Reduction factors:

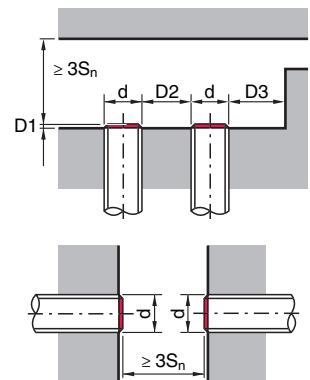
for $S_n = 2.0\text{mm}$		for $S_n = 4.0\text{mm}$	
Steel Fe360	1	Steel Fe360	1
Copper	0.20	Copper	0.40
Aluminum	0.30	Aluminum	0.44
Brass	0.40	Brass	0.54
Stainless steel	0.85	Stainless steel	0.80

### for $S_n = 6.0\text{mm}$

Steel Fe360	1
Copper	0.25
Aluminum	0.30
Brass	0.40
Stainless steel	0.70

## Mounting

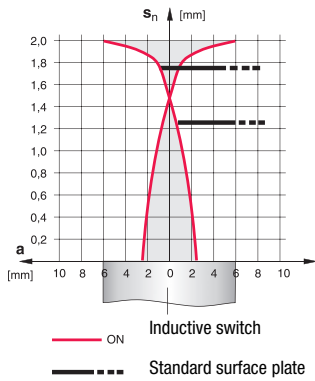
### Embedded installation:



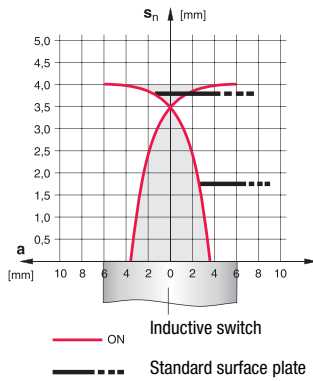
Ferromagnetic and non-ferromagnetic materials			
$S_n$ [mm]	D1 [mm]	D2 [mm]	D3 [mm]
2.0	0	6.0	2.0
4.0	0	12.0	4.0
6.0	2.0	18.0	6.0

Diagrams

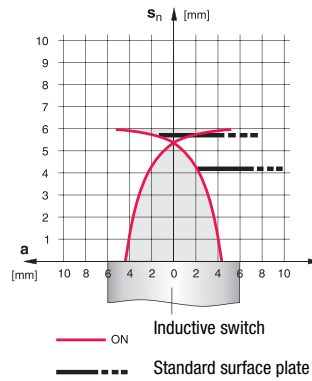
Models with  $S_n = 2.0\text{mm}$



Models with  $S_n = 4.0\text{mm}$



Models with  $S_n = 6.0\text{mm}$



Type key

I S 2 1 2 M M / 4 N O - 4 E 0 - S 1 2

Operating principle / construction

IS Inductive switch / Standard

Series

212 Series with M12 x 1 external thread

Housing / thread

MM Metal housing (active surface: plastic) / metric thread

Output function

- 4NO PNP transistor, make-contact (NO)
- 4NC PNP transistor, break-contact (NC)
- 2NO NPN transistor, make-contact (NO)
- 2NC NPN transistor, break-contact (NC)

Measurement range / type of installation

- 2E0 Typ. scan range limit 2.0mm / embedded installation
- 4E0 Typ. scan range limit 4.0mm / embedded installation
- 6E0 Typ. scan range limit 6.0mm / embedded installation

Electrical connection

- N/A Cable, PVC, standard length 2000mm
- S12 M12 connector, 4-pin, axial
- 200-S12 Cable, PVC, length 200mm with M12 connector, 4-pin, axial

Remarks

● Approved purpose:

The inductive switches are electronic sensors for the inductive, contactless detection of objects. This product may only be used by qualified personnel and must only be used for the approved purpose. This sensor is not a safety sensor and is not to be used for the protection of persons.

