

Original operating manual:

Inductive Sensors series ISS/ISN/ISD-NS-15A-B(-GD)-S249/S250

ISN-NS-15A-B-GD-S250

Housing M30

ISD-NS-15A-B-GD-S249



- Type IS*-NS-15A-B-GD: Analog voltage output 0 - 10VDC
- Type ISD-NS-15A-B-GD-S249: For use in Ex-zones 1, 2, 21, 22
- Type ISN-NS-15A-B-GD-S250: For use in Ex-zones 2, 22
- For embeddable installation method



II 3G Ex nA IIB T4 Gc
II 3D Ex tc IIIA T135°C Dc IP67

II 2G Ex db IIC T5 Gb
II 2D Ex tb IIIC T100°C Db IP67

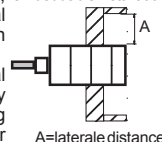
Technical data	Types	ISS-NS-15A-B-S250	ISN-NS-15A-B-GD-S250	ISD-NS-15A-B-GD-S249
Type of Ex protection Gas, according to 2014/34/EU		NONE	II 3G Ex nA IIB T4 Gc	II 2G Ex db IIC T5 Gb
Type of Ex protection Dust, according to 2014/34/EU		NONE	II 3D Ex tc IIIA T135°C Dc IP67	II 2D Ex tb IIIC T100°C Db IP67
For use in Ex zones		NONE	2, 22	1, 2, 21, 22
Performance Level (PL), according to EN 13849-1			PL c	
Category, according to EN 13849-1			1	
Safety integrity level, according to EN 61508			SIL 1	
Safety-related reliability PFHd [1/h]			2.33 x 10 ⁻⁶	
Installation method			embeddable	
Analog voltage output			2V to 11VDC, PNP, output impedance appr. 25Ω, RLoad: 2kΩ to 1MΩ	
Rated operating distance sn, EN60947-2-5			0mm to 15mm, (on steel 37, (sn x 3) ² x 1mm), at embedded mounting	
Safe 2V or 4mA at the output			45mm (sn x 3)	
Temperature drift			-5mV/K	
Nominal supply voltage Ue			24VDC +/-10% (at power supply type PELV at EN 60204, item 6.4.2)	
Isolation voltage Ui			75VDC	
Nominal current consumption Ie			30mA	
Maximum power dissipation			0.83W	
Response time			5ms	
Power-up delay time			70ms	
Adjustment			potentiometer for zero-point adjustment	
Application rating, according to EN 60947-6-1			DC31	
Device designation, according to EN 60947-5-2		M1A30SS2	M1A30SS2	M1A30SS1
Housing		M30, Ms, brass nickel plated / sensing area: Synthetic PEEK mod.		
Enclosure rating, according to EN 60529		IP67		
Vibration and shock resistance		300m/s ² , 10Hz to 55Hz, in all directions, at EN 60947-5-2		
Pollution degree, according to EN 60664-1		3		
Working temperature range Tamb		-20°C < Tamb < +80°C	-10°C < Tamb < +60°C	-10°C < Tamb < +60°C
Storage temperature range		-30°C ... +70°C		
Cable connection, type ISD-NS-15A-B-GD		Cable: TPU, 3+PE x 0.5mm ² , shielded, leads numbering marked, halogen free, Length: 10m		
Socket, type ISS/ISN-NS-15A-B(-GD)		Socket M12, Lumberg type: RSF 5, 5-pins		
Accessories included, all types		- 2x nuts M30 (brass) and 2x shim rings DIN 988, stainless steel A2, 30/42/1mm		
Accessories, types ISN/ISD-NS-15A-B-GD		- 1x Spare safety screw with packing ring for potentiometer sealing		
Accessories, only ISN-NS-15A-B-GD		- Safety lock device, mount at the cable connection, for locking the connection - 1x Dust protection cap for the sensor connector - 1x Warning plate "WARNING - Explosion Hazard - Do Not Disconnect While Circuit Is Live Unless Area Is Known To Be Non-Hazardous", self-sealing, for gluing on the cable connector		
Accessories, not included		- Single ended cordset, Lumberg M12/5P straight type: RKTS 5-298/..M or right angle type: RKWTH 5-298/..M		
Options		- Cable length: Up to 100m on request		
Other safety devices		- Safety inductive sensors Pddb, Ple, SIL3, according to EN 60947-5-3, with switching OSSD - ISD-10-B-GD: Ex type: II 2G Ex db IIC T5 Gb, II 2D Ex tb IIIC T100°C Db IP67 - ISN-10-B-GD: Ex type: II 3G Ex nA IIB T4 Gc, II 3D Ex tc IIIA T135°C Dc IP67 - ISS-10-B: Without Ex protection		
LED indication				
Output function				

Installation: Lateral protection plates must not rise above the sensor.

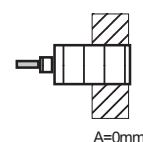
Sensors for not embeddable mounting arrangement have the highest operating distance, but a part of the parasitic lateral electromagnetic field can disturb the safe function. Lateral protection plates or other metallic objects must not influence the Sensor. For safe function a lateral free space around the sensor must be guaranteed.

The series IS*-NS-15A-B(-GD)-S249/S250, sensors for embeddable mounting, no lateral free space is required (A=0). It's possible to realize a better mechanical protection and they have a higher immunity against spurious releasing. In a not embeddable mounting arrangement the sensors reach a lower level of operating distance (sa) then sensors for not embeddable mounting.

Other sensors for not embeddable installation method.



IS*-NS-15A-B: For embeddable installation method



█ = Metal

A=laterale distance

A=0mm

ATEX related designations:

CE 1258 Manufacturer with address
Type ISD-NS-15A-B-GD-S249: II 2G Ex db IIC T5 Gb, II 2D Ex tb IIIC T100°C Db IP67

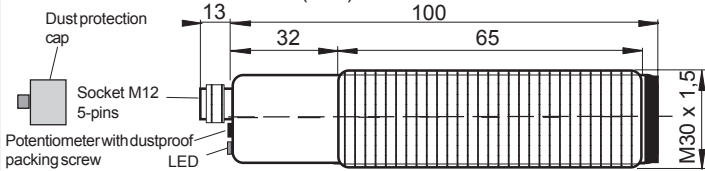
Type ISN-NS-15A-B-GD-S250: II 3G Ex nA IIB T4 Gc, II 3D Ex tc IIIA T135°C Dc IP67



Electrical data according to the chart
ATEX Certification No. BVS 07 ATEX E 044 X
IECEx Certification No. BVS 18.0022X
Declaration by manufacturer,
according to the ATEX directive 2014/34/EU

Tamb: -10°C < Tamb < +60°C Date of production: Numerals 5 to 8 of the serial number (Year/Calendar week)

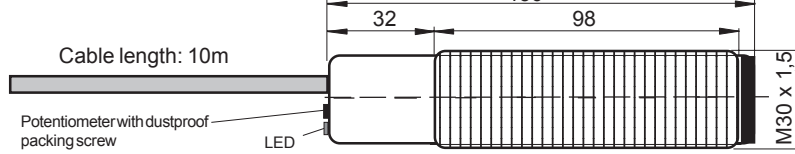
Dimensions ISS/ISN-NS-15A-B(-GD)-S250



Wiring:

ISS-NS-15A-B-S250	ISN-NS-15A-B-GD-S250
1/brown	+24VDC
2/white	NC
3/blue	0V
4/black	Output
5/grey	PA

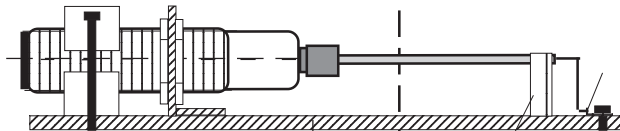
Dimensions ISD-NS-15A-B-GD-S249



Wiring:

Lead-No.	ISD-NS-15A-B-GD-S249
1	+24VDC
2	0V
3	Output
yellow-green	PA/PE

Equipotential bonding prescription:

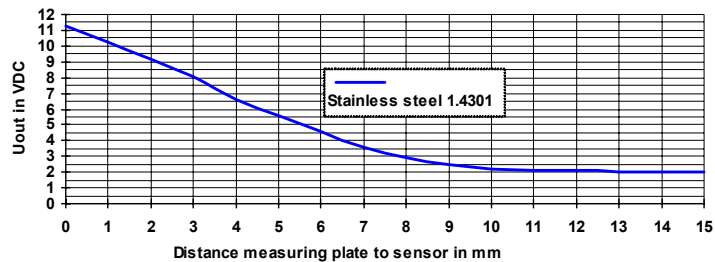


The end of the cable must be connected outside the hazardous location. Check the reliable, noncorrosive holding of the protection earth connection.

The cable shield is to connect to PE in a wide area.

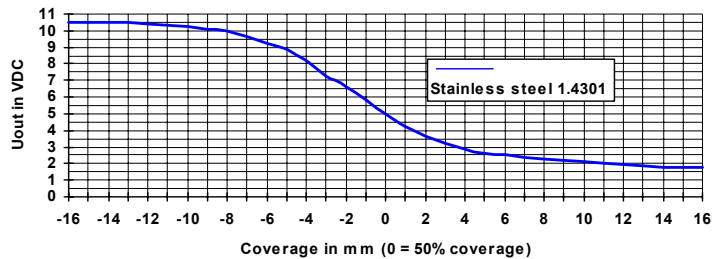
Output characteristic for axial approximation

Measured on plate stainless steel 1.4301 (45mm x 45mm x 1mm). Sensor non-flush mounted. Adjusted with the potentiometer at the rearside to 0V without damping.



Output characteristic for lateral approximation

Measured with plate stainless steel 1.4301 (45mm x 45mm x 1mm). Sensor non-flush mounted. Adjusted with the potentiometer at the rearside to 5V at 50% coverage.



Operating manual / EC-/EU-Declaration of Conformity:

Installation prescriptions for Ex hazardous locations

It is necessary to take into consideration the valid international and national rules and regulations (EN 60079-14). Do not exceed the maximum ratings. The local equipotential bonding have to be done. The protective earth (PE/PA) is solid connected with the housing and the cable shielding. The cable have to be installed and protected against damages. The cable with termination fittings, or in cable tray systems and installed in a manner to avoid tensile stress at the termination fittings. To connect cables inside hazardous locations only use certificated Ex e housings. All cable terminals must be connected outside hazardous locations.

Type ISD-NS-15A-B-GD-S249: Only applicable in Ex zones 1, 2, 21, 22. **Type ISN-NS-15A-B-GD-S250:** Only applicable in Ex zones 2 and 22. The maximum input voltage $U_m=30VDC$ must not be exceeded. The local equipotential bonding have to be done reliable and noncorrosive over the terminal pin 5 and cable shielding. The protective earth (PE/PA) of the socket is solid connected with the housing. Do not separate the connector when the supply voltage is connected to the cable. When installing the sensor, the safety lock device must be fitted at the cable connector. The additional adhesive warning label must be fixed to the connector housing at the connection cable. Lumberg cordsets RKTS 5-298/xx (Straight type) RKTW/RKWTH 5-298/xx (Right angle type) are allowed ONLY. It is necessary to take into consideration the mounting prescription of the connector manufacturer. In dusty locations, the socket protection cap must be fitted, when the connection cable is NOT connected.

Additional safety information related Ex protection

BVS 07 ATEX E 044 X: X = The plastic part of the housing (sensitive area) must be protected against direct sunlight and UV irradiation.

General mounting prescriptions

Lateral protection plates must not rise above the sensor. Metallic protection plates must not rise above the sensor. Electrolytic fluids, graphitized greases or other magnetizable substances can disturb the correct function. The electrical connections must be exactly as shown in the connection diagram. The cable shield must be connected short. The cable shield must be connected to the protection earth, large-surfaced. Connection cables must be installed parallel to high voltage cables.

Function

Equal to the damping of the electromagnetic field, the output varies between 0V and 11V. A strong damping generates a higher voltage. The output characteristic is determined with a measure plate, stainless steel 1.4301 (45mm x 45mm x 1mm) at non-flush mounting

Chemical resistance

The sensor must not be exposed to the following substances: Chromic acid, CAS-No. 7738-94-5. Hydrochloric acid, CAS-No. 7647-01-0. Sulfuric acid, CAS-No. 7664-93-9 / CAS-No. 7783-05-3. Hydrobromic acid 100%, CAS-No. 10035-10-6. Nitric acid, CAS-No. 7697-37-2. Bromine, CAS-No. 7726-95-6. Chlorine, CAS-No. 7782-50-5. Ferric(III) chloride, CAS-No. 7705-08-0 (anhydrous), CAS-No. 10025-77-1. Fluorine, CAS-No. 7782-41-4. Iodine, CAS-No. 7553-56-2. Sodium (hot), CAS-No. 7440-23-5. Concentrated phenol, CAS-No. 108-95-2.

Maintenance:

The sensor does not require any special maintenance. Magnetic precipitations must be cleared. Equipment must only be repaired or serviced by the manufacturer.

General notes to the operating distance

The nominal operating distance s_n (EN60947-2-5) does not take into account production tolerances and influences of temperature or voltage. The output characteristic is determined with a measure plate, stainless steel 1.4301 (45mm x 45mm x 1mm) at non-flush mounting. On other materials or smaller objects a reduction factor must be taken into account.

Material	Reduction factor
Steel37	1.2
Stainlesssteel	1.0
Aluminum	0.4

Safe 0V at the output: An inductive sensor is safe switched OFF, when the distance between sensor and actuator plate is greater then 3 x nominal distance s_n .

General safety instructions

The dismantling of the connector safety lock device while the supply voltage is connected is hazardous! The mounting of the sensor in dusty locations without fixed cordset or protection cap results in a high ignition risk. The sensors must not be used for Accident-Prevention! In worst case the output can change to any state! When installing and operating with the sensor, it is necessary to take into consideration the relevant international and other national regulations: EN 60204, EN 60079-14, UVV, BetrSichV, single directive 1999/92/EC Machine directive: 2006/42/EG, ATEX directive: 2014/34/EU, EMC directive: 2014/30/EU, RoHS directive: 2011/65/EU, EN 60947-5-1/A2:2015-05, EN 60947-5-2:2014-01, EN 60947-5-3:2014-12, EN 13849-1/A1:2013-09, EN 62061/A2:2015-02; EN 60079-0:2012 + A11:2013, EN 60079-1:2014, EN 60079-15:2010, EN 60079-31: 2014, EN 60529:2014, EN 61326-3-1:2015-06.

General Notes, disposal

We reserve the right to modify our equipment. Our equipment is designed such way, that it has the least possible adverse effect on the environment. It neither emit or contain any damaging or siliconized substances and use a minimum of energy and resources. No longer usable or irreparable units must be disposed of in accordance with local waste disposal regulations.

EC-/EU- Declaration of conformity

IECEx certification, type ISD: Ex db IIC T5 Gb, Ex tb IIIC T100°C Db IP67. Certification No. **IECEx BVS 18.0022X**.

ATEX certification, type ISD: II 2G Ex db IIC T5 Gb, II 2D Ex tb IIIC T100°C Db IP67. Certification number: BVS 07 ATEX E 044 X, DEKRA EXAM GmbH, Zertifizierungsstelle, Carl-Beyling-Haus, Dinendahlstrasse 9, D-44809 Bochum, CE 0158.

ATEX certification, type ISN: II 3G Ex nA IIB T4 Gc, II 3D Ex tc IIIA T135°C Dc IP67. ATEX declaration by manufacturer according to the ATEX directive 2014/34/EU. ATEX certification of quality type production of Ex devices according to the ATEX directive 2014/34/EU, CE 1258, Eurofins. Certification No: SEV 21 ATEX 4580. The conformity of the devices with the EC standards and directives and the EC-type examination certificate and the observation of the Quality Management System ISO 9001:2015 with the ATEX module "Production", declares:

Pablo Ledergerber

ISD-NS-15A-B-GD-S249-IECEX_e4/2022-01-27/MP

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