

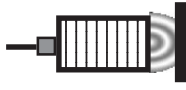

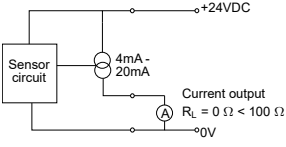
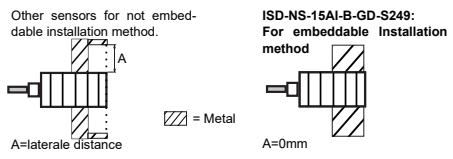
## Original operating manual: ISD-NS-15AI-B-GD-S249 Inductive Sensor

 0158

BVS 18.0022X

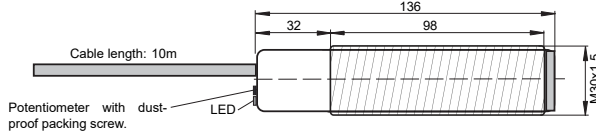
- Current loop output 4mA - 20mA
- For embeddable installation method
- For use in Ex Zones 1, 2, 21, 22


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

	Type	ISD-NS-15AI-B-GD-S249
<b>Technical Data</b>		
Gas Ex protection designation		II 2G Ex db IIC T5 Gb
Dust Ex protection designation		II 2D Ex tb IIIC T100°C Db IP67
For use in Ex Zones		Zones 1, 2, 21, 22
Performance Level (PL)		PL c (according to ISO EN 13849-1)
Safety category		1 (according to ISO EN 13849-1)
Safety integrity level		SIL 1 (according to IEC 61508)
Safety-related reliability PFHd [1/h]		$2.33 \times 10^{-6}$
Response time		5ms
Pollution degree		3 (according to EN 60664-1)
Device designation		M1A30SS1 (according to IEC 60947-5-2)
Installation Method		embeddable
Rated operating distance sn		0mm to 15mm, (on steel 37, (sn x 3) <sup>2</sup> x 1mm), at embedded mounting (according to IEC 60947-5-2)
Safe 4mA at the output		45mm (sn x 3)
Utilization category		DC31 (according to EN 60947-6-1)
Temperature drift		-5mV/K
Supply voltage Ue		24VDC ± 10%
Power supply type		PELV (according to EN 60204, item 6.4.2)
Isolation Voltage Ui		75VDC
Current consumption		30mA
Maximum power dissipation		0.83W
Power up delay time		70ms
Adjustment		Potentiometer for zero-point adjustment
Analog Current Output		4mA to 20mA, PNP, Output impedance approx. 100Ω, RL: 0Ω to 100Ω, PNP
Housing		M30, Ms, brass nickel plated / sensing area: Synthetic PEEK mod.
Enclosure rating		IP67
Ambient working temperature range Tamb		-10°C up to +60°C
Storage temperature range		-40°C up to +90°C
EMC, shock and vibration resistance		300m/s <sup>2</sup> , 10 - 55Hz, in all directions (according to IEC 60947-5-2)
Connection cable		4+PE x 0,5mm <sup>2</sup> , TPU, shielded, leads numbering marked, oil resistant cable for trailing.
Options		Other cable lengths on request
Accessories	<b>Included</b>	<b>Optional</b>
	<ul style="list-style-type: none"> <li>• 2x nuts M30</li> <li>• 1x Spare safety screw with packing ring for potentiometer sealing.</li> <li>• 2x shim rings DIN 988, stainless steel A2, 30/42/1mm</li> </ul>	
LED indication	 Object detected, LED shows red, equal to the output voltage level	 No object detected, LED goes off
Output function:		
<p>Installation: Lateral protection plates must not rise above the sensor. Sensors for non flush mounting arrangement have the highest operating distance, but apart 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.</p> <p>For sensors of type ISD-NS-15AI-B-GD-S249 which are sensors for flush (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 re-leasing. In a not embedded mounting arrangement the sensors reach a lower level of operating distance (sa) than sensors for not embeddable mounting.</p>		
		
Ex related markings	CE 0158 Ex designation according to 2014/34/EU ATEX certification number: IECEx certification number: Tamb Date of construction: Electrical data according to the table "Technical data"	Manufacturer with address II 2G Ex db IIC T5 Gb , II 2D Ex tb IIIC T100°C Db IP67 BVS 07 ATEX E 044 X BVS 18.0022X -10°C up to +60°C Numeral 5 to 8 of the serial number (year/calendar week)

ISD-NS-15AI-B-GD-S249\_e1/2020-05-20/TK

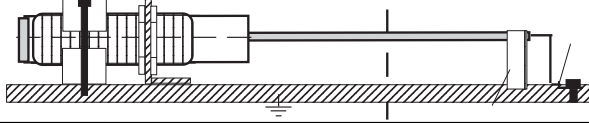
Dimensions and wiring



Function	Lead-No
+24VDC	1
0V	2
Output	3
PE	yellow-green
Shield	Weiss

EX ZONE

Safe equipotential bonding for Ex devices:  
Check the reliable, noncorrosive holding of the PE connection.

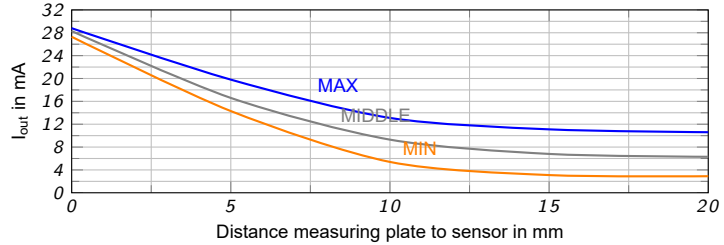


NON-HAZARDOUS AREA

The end of the cable must be connected outside the hazardous locations.  
The cable shield is to connect to PE large-surfaced.

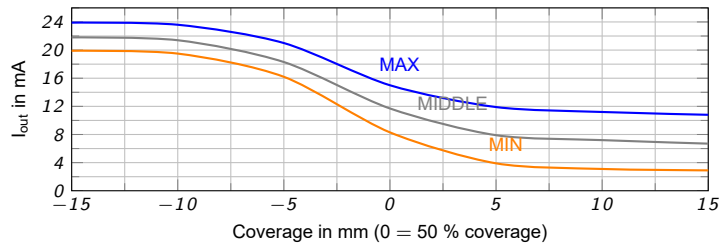
Output characteristic for axial approximation

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 on 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

Only applicable in Ex Zones 1, 2, 21, 22. 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 reliable and noncorrosive. 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.

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. 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 not be installed parallel to high voltage cables.

Function

Equal to the damping of the electromagnetic field, the output varies between 4mA and 20mA. A strong damping generates a higher current. 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 sn (IEC 60947-5-2) 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
Steel 37	1.2
Stainless steel	1.0
Aluminum	0.4

Safe 4mA at the output: An inductive sensor is safe switched OFF, when the distance between sensor and actuator plate is greater than 3 x nominal distance sn.

General safety instructions

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.

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.

EU-Declaration of Conformity

The product complies with the following standards and provisions:  
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  
ATEX: EU type examination certificate no. BVS 07 ATEX E 044 X, IECEx CoC: IECEx BVS 18.0022X, NB: DEKRA Testing and Certification GmbH, Carl-Beyling-Haus, Dinendahlstrasse 9, D-44809 Bochum, Ident number: 0158.  
ATEX certificate for the production of Ex products according to the ATEX directive 2014/34/EU No: BVS 18 ATEX ZQS/E118, QAR No. DE/BVS/QAR13.0004/04, Dekra Testing and Certification GmbH, certification body, Carl-Beyling-Haus, Dinendahlstrasse 9, D-44809 Bochum, identification number: 0158.  
The conformity of the devices with all used 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:

Ehrendingen, 20.5.2020

Pablo Ledergerber, Matrix Elektronik AG

ISD-NS-15Al-B-GD-S249\_e1/2020-05-20/TK

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