IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
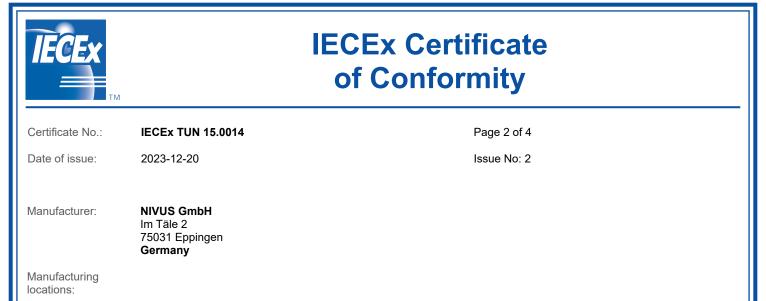### IEC Certification System for Explosive Atmospheres
for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.:	**IECEx TUN 15.0014**	Page 1 of 4
Status:	**Current**	Issue No: 2
Date of Issue:	2023-12-20	

Applicant:
NIVUS GmbH
Im Täle 2
75031 Eppingen
Germany

Equipment: **Sensors type POA, OCL and CS2 "See type code for details"**

Optional accessory:

Type of Protection: **Intrinsic safety**

Marking: Ex ib IIB T4 Gb

Approved for issue on behalf of the IECEx
Certification Body:

Thomas Heinen

Position:

Deputy Head of the IECEx Certification Body

Signature:
(for printed version)

Date:
(for printed version)

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
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Certificate issued by:

TÜV NORD CERT GmbH
Hanover Office
Am TÜV 1, 30519 Hannover
Germany

TÜV NORD

IECEx Certificate of Conformity

Manufacturer: **NIVUS GmbH**
Im Täle 2
75031 Eppingen
Germany

Manufacturing locations:

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements.This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended

STANDARDS :
The equipment and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards

IEC 60079-0:2017   Explosive atmospheres - Part 0: Equipment - General requirements
Edition:7.0

IEC 60079-11:2011   Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
Edition:6.0

This Certificate **does not** indicate compliance with safety and performance requirements
other than those expressly included in the Standards listed above.

TEST & ASSESSMENT REPORTS:
A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in:

Test Report:

DE/TUN/ExTR15.0032/01

Quality Assessment Report:

DE/TUN/QAR13.0011/09

EQUIPMENT:
Equipment and systems covered by this Certificate are as follows:

Description:

The sensors type POA, OCL and CS2 according to the type code are intended for measurement of the flow speed and the flow level in partly or fully filled pipes and channels via ultrasonic technology.

Type code; Electrical data:

Refer to the attachement to IECEx TUN 15.0014issue No.2

Thermal data:

Permissible ambient temperature range during operation: -20 °C ≤ Ta ≤ +40 °C

SPECIFIC CONDITIONS OF USE: NO

IECEx Certificate of Conformity

DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)
Proof of conformity of the sensors type POA-x2xx xx E xx x x, OCL-L1 xx xx E xx K and CS2-xxxx xx E xx x x to the current versions of the standards IEC 60079-0:2017 and IEC 60079-11:2011.

Annex:

Attachment to IECEx TUN 15.0014 issue No.2.pdf

TÜV NORD CERT GmbH
Hannover Office
Am TÜV 1
30519 Hannover
Germany

Description:
The sensors type POA, OCL and CS2 according to the type code are intended for measurement of the flow speed and the flow level in partly or fully filled pipes and channels via ultrasonic technology.

Type code:
POA-x2xx xx E xx x x, OCL-L1 xx xx E xx K and CS2-x2xx xx E xx x x resp.
POA-x3xx xx E xx x x, OCL-L3 xx xx E xx K and CS2-x3xx xx E xx x x

POA-	Type	Sensor with location-resolved flow velocity over (up to) 16 scan layers					
	V200 V300	without level measurement					
		KT	Wedge sensor made of PPO with PEEK insert; base plate 1.4571				
		Kx	Wedge sensor special version				
		RT	PPO tube sensor with PEEK insert; tube material 1.4571				
		Rx	Tube sensor special version				
	V2H1 V3H1	With ultrasound from below for level measurement					
		KT	Wedge sensor made of PPO with PEEK insert; base plate 1.4571				
		Kx	Wedge sensor special version				
		RT	PPO tube sensor with PEEK insert; tube material 1.4571				
		Rx	Tube sensor special version				
	V2D0 V3D0	with pressure cell for level measurement					
		KT	Wedge sensor made of PPO with PEEK insert; base plate 1.4571				
		Kx	Wedge sensor special version				
	V2U1 V3U1	with pressure cell and ultrasound from below for level measurement					
		KT	Wedge sensor made of PPO with PEEK insert; base plate 1.4571				
		Kx	Wedge sensor special version				
		ATEX approval					
			0	without			
			E	Zone 1			
			Cable length (max. 150m / with pressure cell up to 30m possible)				
				xx			
					Sensor connection		
					x		
						Tube length (0 for wedge sensor)	
							x

OCL-L1 OCL-L3	Type + design	Air ultrasonic sensor				
	KS	Wedge sensor standard version PPO; cable: PUR				
	xx	Special version				
		Transmission frequency				
		12	120 kHz			
		xx	Special version			
		IECEx approval				
		0	without			
		E	Zone 1			
		Cable length (max. 150m)				
			xx			
				Sensor connection		
				K	Cable end prefabricated	

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CS2-	Type	Correlation sensor for large geometries						
	V200 V300	without level measurement						
		KT	Wedge sensor made of PPO with PEEK insert; base plate 1.4571					
		Kx	Wedge sensor special version					
		RP	Tube sensor made of highly resistive solid PEEK; tube material 1.4571					
		Rx	Tube sensor special version					
	V2H1 V3H1	With ultrasound from below for level measurement						
		KT	Wedge sensor made of PPO with PEEK insert; base plate 1.4571					
		Kx	Wedge sensor special version					
	V2D0 V3D0	with pressure cell for level measurement						
		KT	Wedge sensor made of PPO with PEEK insert; base plate 1.4571					
		Kx	Wedge sensor special version					
	V2U1 V3U1	with pressure cell and ultrasound from below for level measurement						
		KT	Wedge sensor made of PPO with PEEK insert; base plate 1.4571					
		Kx	Wedge sensor special version					
			ATEX approval					
			0	without				
			E	Zone 1				
				Cable length (max. 150m / with pressure cell up to 30m possible)				
				xx				
					Sensor connection			
					x			
						Tube length (0 for wedge sensor)		
						x		

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Electrical data:

POA-x2xx xx E xx x x, OCL-L1 xx xx E xx K and CS2-x2xx xx E xx x x:

Signal- and supply circuit	In type of protection intrinsic safety Ex ib IIB
(Cabel tail;	Only for connection to certified intrinsically safe circuits.
Connection wires:	Maximum values:
Red (X6): +	
Blue (X8): GND)	

U_i = 10.5 V
I_i = 640 mA
P_i = 6.72 W

Effective internal capacitance C_i	Capacitance of the permanently connected cable C_c
	C_c = 90 pF/m x L*
Effective internal inductance L_i	Inductance of the permanently connected cable L_c
	L_c = 0.76 µH/m x L*

L*: Length of the connected cable has to not exceed 150 m

The connection to the following measuring transducers of the manufacturer NIVUS is permissible:
Type OCP-...
Type PCP-...
Type IXT0-...

Connection wire black (X10)	Shield

RS485 interface	In type of protection intrinsic safety Ex ib IIB with maximum values:
(Cabel tail;	
Connection wires:	
White (X14): RxTx+	
Green (X13): RxTx-	
Blue (X8): GND)	

U_o = 6 V
I_o = 81.9 mA (long time; for calculation of P_o)
I_o = 154 mA (short time; for calculation of L_o, C_o)
P_o = 123 mW
Characteristic line: linear
Effective internal capacitance C_i = 10.5 nF
Effective internal inductance L_i = 117 µH

The maximum permissible values for the external inductance L_o and the external capacitance C_o can be found in the following table:

Ex ib IIB	L_o [mH]	12.88	9.88	0.38	0.083
	C_o [µF]	7.08	8.38	21.98	29.98

At connection of the RS485 interface to belonging measuring transducers with active intrinsically safe circuits, the rules for the interconnection of intrinsically safe circuits have to be observed.

Or

RS485 interface	Maximum values:
(Cabel tail;	U_i = 12.06 V
Connection wires:	I_i = 176 mA
White (X14): RxTx+	P_i = 531 mW
Green (X13): RxTx-	
Blue (X8): GND)	

Effective internal capacitance C_i	Capacitance of the permanently connected cable C_c
	C_c = 70 pF/m x L*
Effective internal inductance L_i	Inductance of the permanently connected cable L_c
	L_c = 0.78 µH/m x L*

L*: Length of the connected cable has to not exceed 150 m.

The internal pressure circuit (X1..X4) and temperature circuit (X12;X5;X7) are designed in type of protection intrinsic safety Ex ib IIB and are not accessible to the user.

POA-x3xx xx E xx x x, OCL-L3 xx xx E xx K and CS2-x3xx xx E xx x x:

Signal- and supply circuit	In type of protection intrinsic safety Ex ib IIB
(Cabel tail;	Only for connection to certified intrinsically safe circuits.
Connection wires:	Maximum values:
Red (X1): +	
Blue (X2): GND)	
	U_i = 10.5 V
	I_i = 640 mA
	P_i = 6.72 W
Effective internal capacitance C_i	Capacitance of the permanently connected cable C_c
	C_c = 90 pF/m x L*
Effective internal inductance L_i	Inductance of the permanently connected cable L_c
	L_c = 0.76 µH/m x L*

L*: Length of the connected cable has to not exceed 150 m.

The connection to the following measuring transducers of the manufacturer NIVUS is permissible:
Type OCP-...
Type PCP-...
Type IXT0-...

Connection wire black (X3)	Shield

RS485 interface	In type of protection intrinsic safety Ex ib IIB with maximum values:
(Cabel tail;	
Connection wires:	
White (X5): RxTx+	
Green (X4): RxTx-	
Blue (X2): GND)	
	U_o = 5.4 V
	I_o = 76 mA (long time; for calculation of P_o)
	I_o = 124.93 mA (short time; for calculation of L_o, C_o)
	P_o = 102.6 mW
	Characteristic line: linear
	Effective internal capacitance C_i = 10.5 nF
	Effective internal inductance L_i = 117 µH

The maximum permissible values for the external inductance L_o and the external capacitance C_o can be found in the following table:

Ex ib IIB	L_o [mH]	19.88	9.88	0.38	0.08
	C_o [µF]	7.98	11.98	27.98	36.98

At connection of the RS485 interface to belonging measuring transducers with active intrinsically safe circuits, the rules for the interconnection of intrinsically safe circuits have to be observed.

Or

RS485 interface
(Cabel tail;
Connection wires:
White (X5): RxTx+
Green (X4): RxTx-
Blue (X2): GND)

Maximum values:
U_i = 10.7 V
I_i = 236.3 mA
P_i = 634.4 mW

Effective internal capacitance C_i Capacitance of the permanently connected cable C_c
C_c = 70 pF/m x L*

Effective internal inductance L_i Inductance of the permanently connected cable L_c
L_c = 0.78 µH/m x L*

L*: Length of the connected cable has to not exceed 150 m.

The internal pressure circuit (X6..X9) and temperature circuit (X10;X11;X12) are designed in type of protection intrinsic safety Ex ib IIB and are not accessible to the user.

Thermal data:
Permissible ambient temperature range during operation: -20 °C ≤ Ta ≤ +40 °C

Details of change:
Proof of conformity of the sensors type POA-x2xx xx E xx x x, OCL-L1 xx xx E xx K and
CS2-xxxx xx E xx x x to the current versions of the standards IEC 60079-0:2017 and IEC 60079-11:2011.

Specific Conditions of Use:
None.