

## Instruction Manual for NivuMaster P-Series Ultrasonic Sensors

(Original Instruction Manual – German)



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### **Translation**

If the device is sold to a country in the European Economic Area (EEA) this instruction handbook must be translated into the language of the country in which the device is to be used.

Should the translated text be unclear, the original instruction handbook (German) must be consulted or the manufacturer contacted for clarification.

### **Copyright**

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### **Names**

The use of general descriptive names, trade names, trademarks and the like in this handbook does not entitle the reader to assume they may be used freely by everyone. They are often protected registered trademarks even if not marked as such.

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## 1.2 Ex-Approval sensors (option)



**sira**  
Certification Service

1 **EC TYPE-EXAMINATION CERTIFICATE**

2 Equipment intended for use in Potentially Explosive Atmospheres Directive 94/9/EC

3 Certificate Number: Sira 03ATEX5277X

4 Equipment: Nivus P Series of Ultrasonic Transducers

5 Applicant: Nivus GmbH

6 Address: Im Tale 2  
D-75031  
Eppingen  
Germany

7 This equipment and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

8 Sira Certification Service, notified body number 0514, in accordance with Article 9 of Directive 94/9/EC of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential report number 52V10349.

9 Compliance with the Essential Health and Safety Requirements, with the exception of those listed in the schedule to this certificate, has been assured by compliance with the following documents:

EN 50014:1997 plus Amendments 1 and 2  
EN 50 028:1987

10 If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

11 This EC type-examination certificate relates only to the design and construction of the specified equipment. If applicable, further requirements of this Directive apply to the manufacture and supply of this equipment.

12 The marking of the equipment shall include the following:



II 2GD

EEx m II T6 (Tamb = -40°C to +75°C)

Project Number 52V10349  
Date 19 August 2003  
C. Index 13

This certificate and its schedules may only be reproduced in its entirety and without change



G Tortoisshell IEng MIEE MInstMC  
Principal Consultant

**Sira Certification Service**

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Sira Certification Service is a service of Sira Test & Certification Ltd

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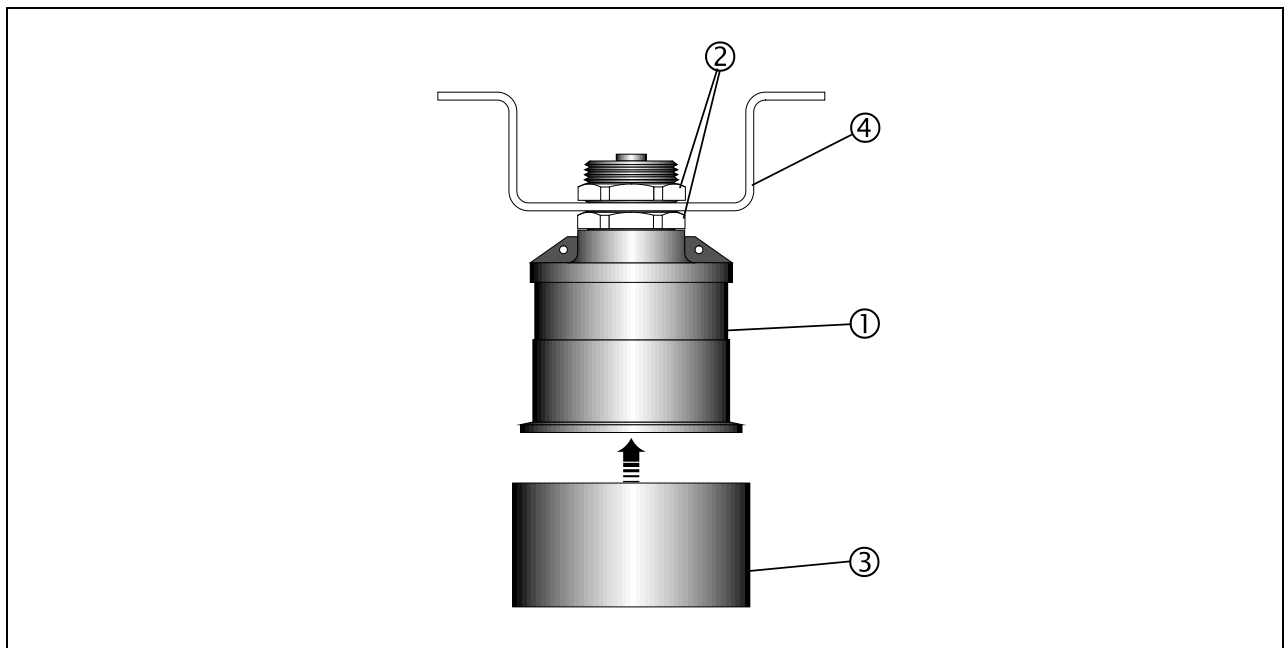


*The approval is only valid in connection with the respective indication on the sensor nameplate.*

*The complete EC-Type Examination Certificate is available on the Internet at [www.nivus.com](http://www.nivus.com).*

## 2 Overview and use in accordance with the requirements

### 2.1 Overview



- 1 Sensor
- 2 two Screw nuts G1" PVC
- 3 Flood protection sleeve (option)
- 4 Holder bracket (option)

**Fig. 2-1 Overview**

### 2.2 Use in accordance with the requirements

The NivuMaster series ultrasonic sensors are intended to be used for non-contact fill level measurement in conjunction with the according NivuMaster transmitters. Here the allowed maximum values as specified in chapter 2.3 shall be adhered to. All cases varying from these conditions and not passed by NIVUS GmbH in writing are left at owner's risk.



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*The device is exclusively intended to be used for purposes as described above. Modifying or using the devices for other purposes without the written consent of the manufacturer will not be considered as use in accordance with the requirements.*

*Damages resulting from this are left at user's risk.*

*The device is designed for a lifetime of approx. 10 years. After that period an inspection in addition with a general overhaul shall be made.*

---

#### Ex-Protection

The Ex-version of the sensor is designed to be used in areas with explosive atmospheres (zone 1 or zone 0).



---


*The transmitter always has to be installed outside of Ex-zones!*

---

#### Approval (option)

Sensor:

 II 2GD Ex m II T6

(also available as  II 1GD Ex ia IIC T6, only in conjunction with intrinsically safe transmitter (ia))



---

*The approval is only valid in connection with the respective indication on the transmitter or the sensor nameplate.*

---



---

*For installation and initial start-up the conformity certificates and test certificates of the respective authorities must be followed.*

---



### 2.3 Specifications

Type:	P-M3	P 03	P 06	P 10	P 15	P 25	P40
<b>Measurement range:</b>	0.07 to 2.4 m	0.125 to 3 m	0.3 to 6 m	0.3 to 10 m	0.5 to 15 m	0.6 to 25 m	1.2 to 40 m
<b>Frequency:</b>	125 kHz		75 kHz	50 kHz	41 kHz	30 kHz	20 kHz
<b>Enclosure material:</b>	Valox 357		Valox 357 PVDF		Valox 357		
<b>Enclosure protection::</b>	IP68						
<b>Temperature:</b>	-30 °C to 95 °C  (operation in hazardous area -30 °C to 75 °C)		-40 °C to 95 °C  (operation in hazardous area -40 °C to 75 °C)				
<b>Beam angle:</b>	12°		12°	10°	9°	10°	7°
<b>Ex-approval:</b>	II 2GD Ex m II T6 (also available II 1GD Ex ia IIC T6, in connection with an intrinsical transmitter (ia) only)						
<b>Cable length:</b>	5 m, 10 m, 20 m, 30 m, 50 m and 100 m, special length on request						
<b>Option</b>							
<b>Flange</b>	not available		- flanges for nominal diameters 80 / 100 / 150 / 200 mm, ANSI 3" / 4" / 6" / 8" with Teflon-coated sensor face for aggressive media, max. 70 °C			not available	
<b>Coating</b>	not available		with soft foam sensor face for dusty bulk solids			not available	
<b>Flooding</b>	<ul style="list-style-type: none"> <li>- with submergence shield</li> <li>- to generate echo loss in flooded condition</li> <li>- no soiling if sensor face is getting flooded, no need to clean the sensor face</li> </ul>					not available	
<b>additional</b>	<ul style="list-style-type: none"> <li>- with insulation adapter for decoupling if sensor thread is screwed directly into metal threads (P 03 with thread on cable side)</li> <li>- sensor aiming kit for bulk material applications</li> </ul>						

### 3 General Notes on Safety and Danger

#### 3.1 Danger Notes

##### 3.1.1 General Danger Signs



---

**Cautions**  
*are framed and labelled with a warning triangle.*

---



---

**Notes**  
*are framed and labelled with a "hand".*

---



---

**Danger by electric voltage**  
*is framed and labelled with the Symbol on the left.*

---



---

**Warnings**  
*are framed and labelled with a "STOP"-sign.*

---

For connection, initial start-up and operation of the NivuMaster Ultrasonic-Sensors the following information and higher legal regulations (e.g. in Germany VDE), such as Ex-regulations as well as safety requirements and regulations in order to avoid accidents, must be observed.

All operations, which go beyond steps to install, to connect or to program the device, must be carried out by NIVUS staff only due to reasons of safety and guarantee.

##### 3.1.2 Special Danger Notes



---

*Please note that due to the operation in the waste water field, transmitter, sensors and cables may be loaded with dangerous disease germs. Respective precautionary measures must be taken to avoid damage to one's health.*

---

### 3.2 Device Identification

The instructions in this manual are valid only for the type of device indicated on the title page.

The type ID label is wrapped around the sensor and contains the following specifications:

- Name and phone number of manufacturer
- CE label
- Type and serial number
- Year of manufacture
- Ex-label (on Ex-version devices only) as mentioned in chapter 2.3.

It is important for enquiries and replacement part orders to specify article number as well as serial number of the respective transmitter or sensor. This ensures correct and quick processing.

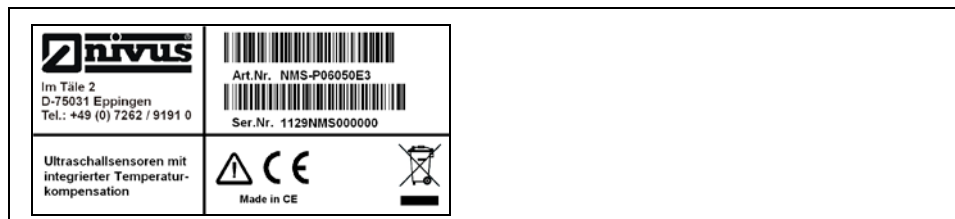


Fig. 3-1 Nameplate of sensors

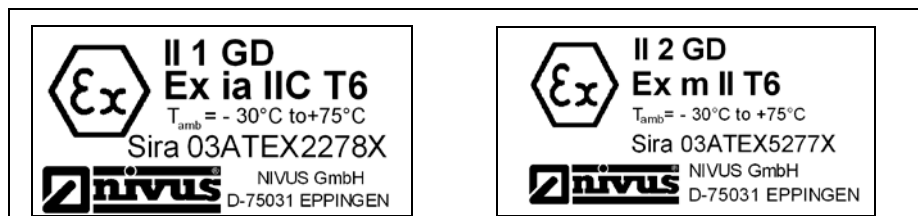


Fig. 3-2 Ex-label zone 0 and 1 for sensors, type P03 / PM3

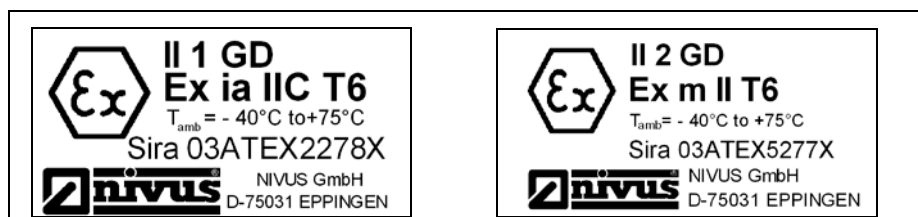


Fig. 3-3 Ex-label zone 0 and 1 for sensors, type P06, P10....



*This instruction manual is a part of the device and must be available for the user at any time.*

*The safety instructions contained within must be followed.*



*It is strictly prohibited to disable the safety contrivances or to change the way they work.*

### 3.3 Installation of Spare Parts and Parts subject to wear and tear

We herewith particularly emphasize that replacement parts or accessories, which are not supplied by us, are not certified by us, too. Hence, the installation and/or the use of such products may possibly be detrimental to the device's ability to work.

Damages caused by using non-original parts and non-original accessories are left at user's risk.

#### 3.3.1 List of Spare Parts

1. sensor complete
2. counter nut
3. holder bracket

### 3.4 Turn-off procedure



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*For maintenance, cleaning and repairs (authorised staff personnel only) the device shall be disconnected from mains and shall be prevented from being turned on again unintentionally.*

---

### 3.5 User's Responsibilities



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*In the EEA (European Economic Area) national implementation of the framework directive 89/391/EEC and corresponding individual directives, in particular the directive 89/655/EEC concerning the minimum safety and health requirements for the use of work equipment by workers at work, as amended, are to be observed and adhered to.*

*In Germany the Industrial Safety Ordinance must be observed.*

---

The customer must (where necessary) obtain any local **operating permits** required and observe the provisions contained therein.

In addition to this, he must observe local laws and regulations on

- personnel safety (regulations on safety at work)
- safety of work materials and tools (safety equipment and maintenance)
- disposal of products (laws on wastes)
- disposal of materials (laws on wastes)
- cleaning (cleansing agents and disposal)
- environmental protection

#### **Connections:**

Before operating the device the user has to ensure, that the local regulations (e.g. for operation in channels) on installation and initial start-up are taken into account, if this is both carried out by the user.

## 4 Functional Principle

### 4.1 General

The ultrasonic sensor sends ultrasonic impulses, where the amplitude of the sonic energy sent will exhibit reciprocally proportional decrease to the square of the measurement distance. The maximum performance is sent along a vertical line off the sensor face and the tapered border of the sonic lobe is defined at 50 % performance (-3dB). The measured angle is called the beam angle. The medium to be measured will reflect these sonic impulses as echoes and transmits this signal to the transmitter. Now the distance is calculated from the sonic transit time.

For special applications there are special constructions and versions (such as Teflon-coated flange versions for aggressive media, flood protection sleeves for applications where sensors may be immersed or sensors with Ex approval for use in Ex zone 1 or zone 0) available.

### 4.2 Device Versions

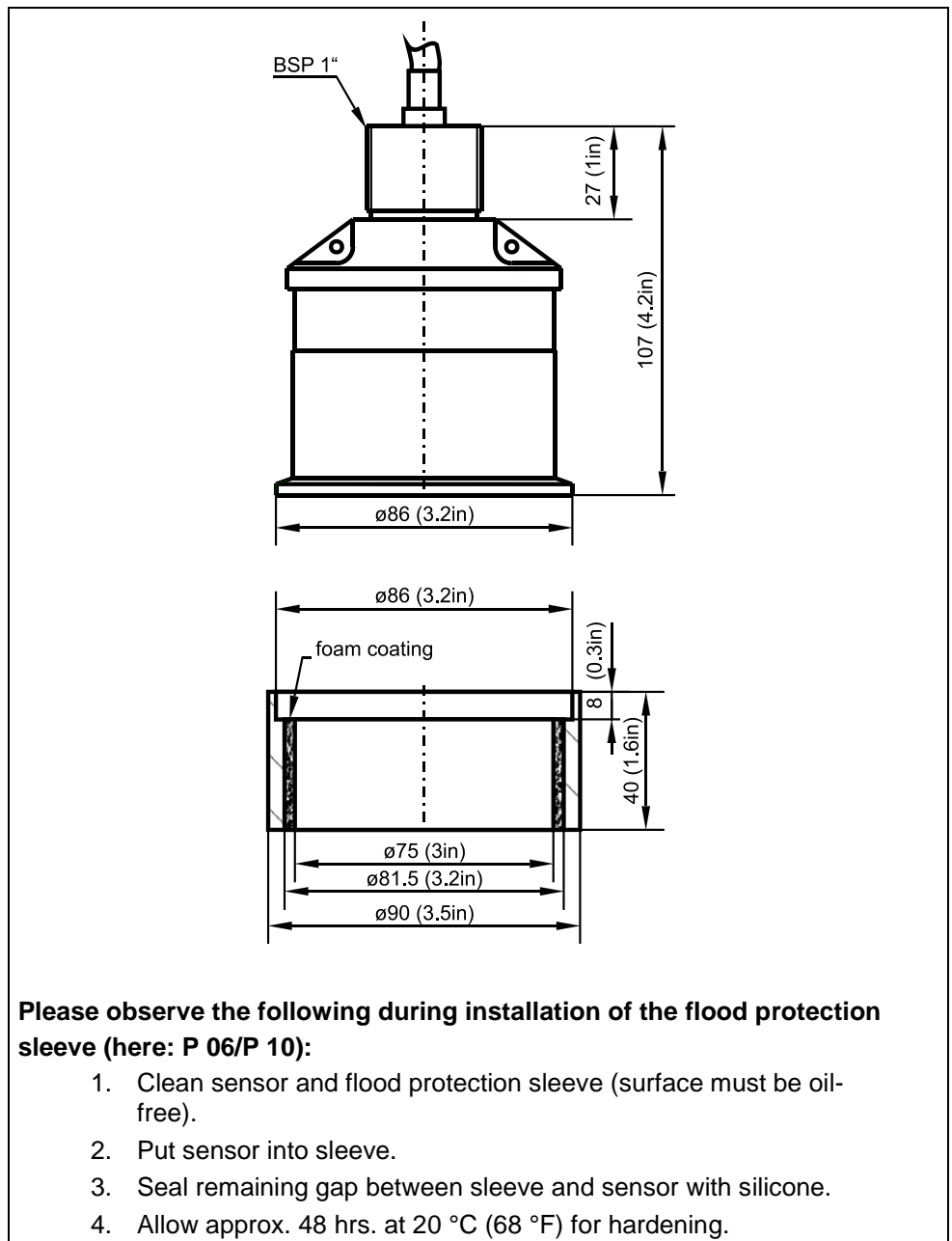
The NivuMaster Sensors are available in different versions. The tables below give a brief overview on the various possibilities.

<b>HMS-</b>	<b>Type</b>
	<b>Standard version</b>
	<b>P06</b> 0.30 to 6 m for fluids
	<b>P10</b> 0.30 to 10 m for fluids
	<b>P15</b> 0.50 to 15 m for fluids
	<b>P25</b> 0.60 to 25 m for fluids
	<b>P40</b> 1.2 to 40 m for fluids
	<b>Special version with low dead zone</b>
	<b>PM3</b> 0.07 to 2.45 m for fluids; resolution ±1mm especially for level/volume measurement (incl. weatherproof cover and flood protection head)
	<b>P03</b> 0.125 to 3 m for fluids; resolution ±2mm especially for level measurement <b>Attention: for volume-based (flow rate) applications use PM3!</b>
	<b>PS6</b> 0.20 to 6 m for fluids
	<b>Sensor Cable Length</b>
	<b>05</b> 5 m
	<b>10</b> 10 m
	<b>20</b> 20 m
	<b>30</b> 30 m
	<b>50</b> 50 m
	<b>99</b> 100 m
	<b>xx</b> Special cable length upon request
	<b>Sensor body</b>
	<b>0</b> Valox (standard)
	<b>P</b> PVDF
	<b>Approvals</b>
	<b>0</b> none
	<b>E</b> Ex zone 1
	<b>Z</b> Ex zone 0 (only in conjunction with Ex zone 0 transmitter)
	<b>Extensions</b>
	<b>0</b> none
	<b>2</b> SUB - Flood protection head 1" only for P03
	<b>3</b> SUB - flood protection head 86 mm only for PS6, P06, P10 and P15
<b>HMS-</b>	<b>0</b>

Fig. 4-1 Type key for ultrasonic sensors

#### 4.2.1 Flood protection sleeve (Option)

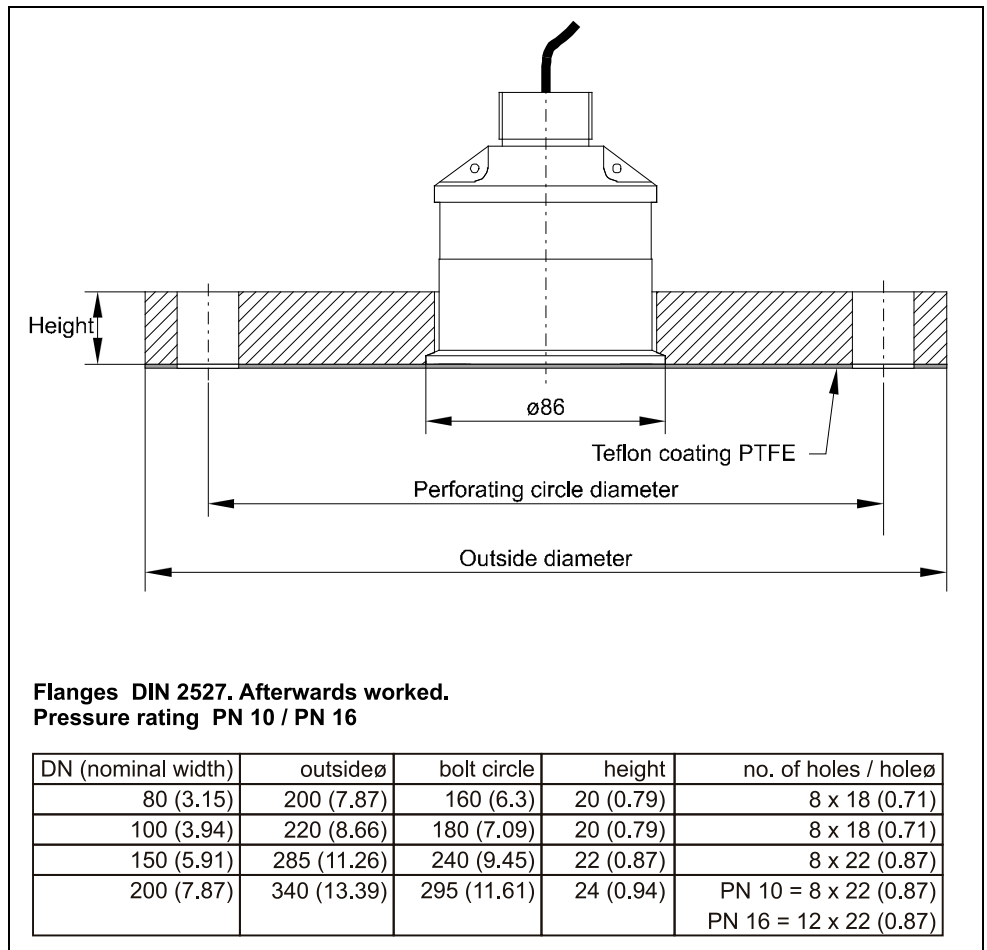
The flood protection sleeve causes an air cushion to form in front of the sensor face in case of immersion. Electronic components detect this defined condition. Please observe that measuring however is not possible until the flood situation has been reached as soon as material is getting into the blanking distance area! There is a risk of measurement errors if foam should get into the sleeve! The flood protection sleeve is also available as upgrade kit.



**Fig. 4-2 Flood protection sleeve for P-Series sensors**

#### 4.2.2 DIN-Flange Versions (Option)

NivuMaster sensors are available in various DIN-Flange versions.  
If you should have questions please contact the NIVUS head office.



**Fig. 4-3 Dummy flanges according to DIN 2527 for P-Series sensors**

## 5 Storing, Delivery and Transport

### 5.1 Receipt

Please check your delivery according to the delivery note for completeness and intactness immediately after receipt. Any damage in transit must be instantly reported to the carrier. An immediate, written report must be sent to NIVUS GmbH Eppingen as well.

Please report any delivery incompleteness in writing to your representative or directly to NIVUS Eppingen within two weeks.



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*Mistakes cannot be rectified later!*

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#### 5.1.1 Delivery

The standard delivery of the NivuMaster Ultrasonic-Sensors contains:

- the instruction manual with the certificate of conformity. Here, all necessary steps to correctly install and to operate the measurement system are listed.
- 1 Ultrasonic-Sensor
- 2 x screw nuts (G1" PVC)

Additional accessories depending on order. Please check by using the delivery note.

### 5.2 Storing

The following storing conditions must be strictly adhered to:

NivuMaster Sensor:	max. temperature:	+ 95 °C (203 °F)
	min. temperature:	- 40 °C (-40 °F)

The devices must be protected from corrosive or organic solvent vapours, radioactive radiation as well as strong electromagnetic radiation.

### 5.3 Transport

The Sensors are conceived for harsh industrial conditions. Despite this do not expose them to heavy shocks or vibrations.

Transportation must be carried out in the original packaging.

### 5.4 Return

The units must be returned at customer cost to NIVUS Eppingen in the original packaging.

Otherwise the return cannot be accepted!



## 6 Installation

### 6.1 General

For electric installation the local regulations in the respective countries (e.g. VDE 0100 in Germany) must be referred to.



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*NivuMaster sensor power supply is allowed to be carried out via the NivuMaster transmitter exclusively.*

---

Before feeding the rated voltage the transmitter and sensor installation must be correctly completed. The installation should be carried out by qualified personnel only. Further statutory standards, regulations and technical rulings have to be taken into account.

The sensor protection rating is IP 68.

Please check if the power supply of the accompanying transmitter must be integrated into the facility's emergency shutdown conception.

### 6.2 Installation and Connection of NivuMaster Sensors

#### 6.2.1 General

The sensors mounting place has to be selected according to certain criteria. Please strictly avoid:

- heat emitting objects (max. ambient temperature: +95 °C (203 °F))
- objects with strong electromagnetic fields (e.g. frequency converters, electric motors with high power consumption or similar)
- corrosive chemicals or gas
- mechanical shocks
- vibrations
- radioactive radiation
- installation close to footpaths or travel ways



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*Removing or loosening cable glands results in leakage and causes a failure in the measurement / the sensor.*

**No** sensor parts are allowed to be removed on principle!

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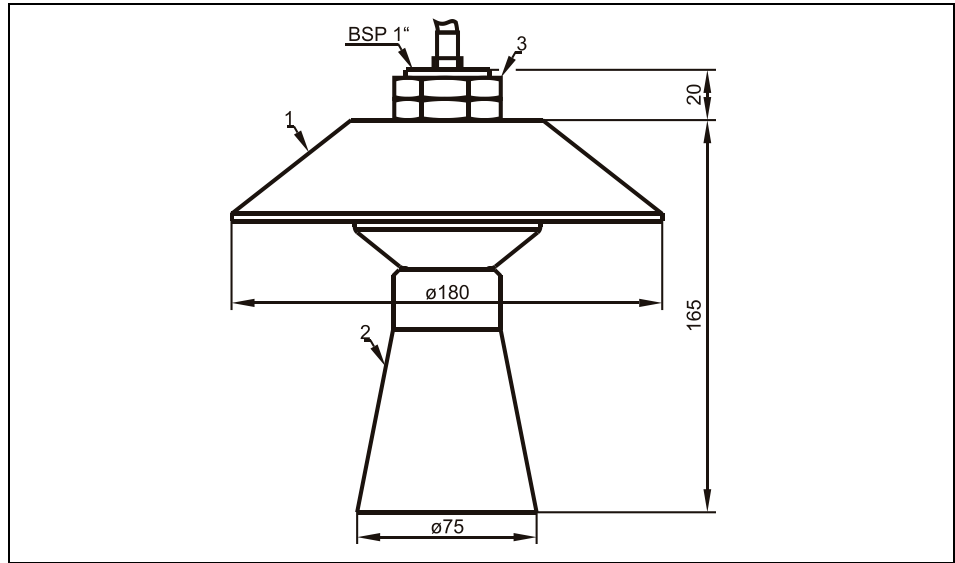
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*To avoid disturbances from electrical interferences, the sensor cable must not be laid close to (or parallel to) engine (motor) lines or main power lines.*

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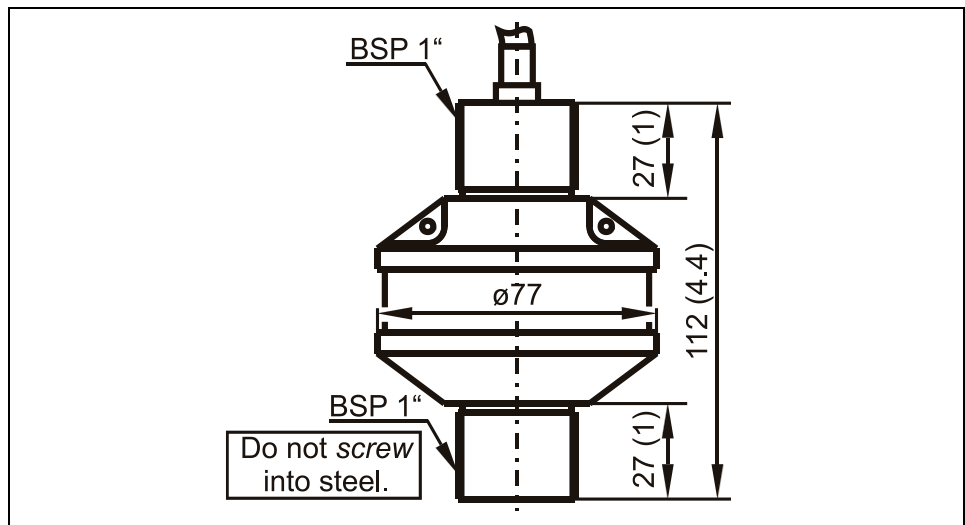
### 6.2.2 Sensor Dimensions

Dimensions in mm (inch)



- 1 Protective cover
- 2 Flood protection sleeve
- 3 Fastening screws

**Fig. 6-1 P-M3 ultrasonic sensor dimensions**



**Fig. 6-2 P 03 ultrasonic sensor dimensions**

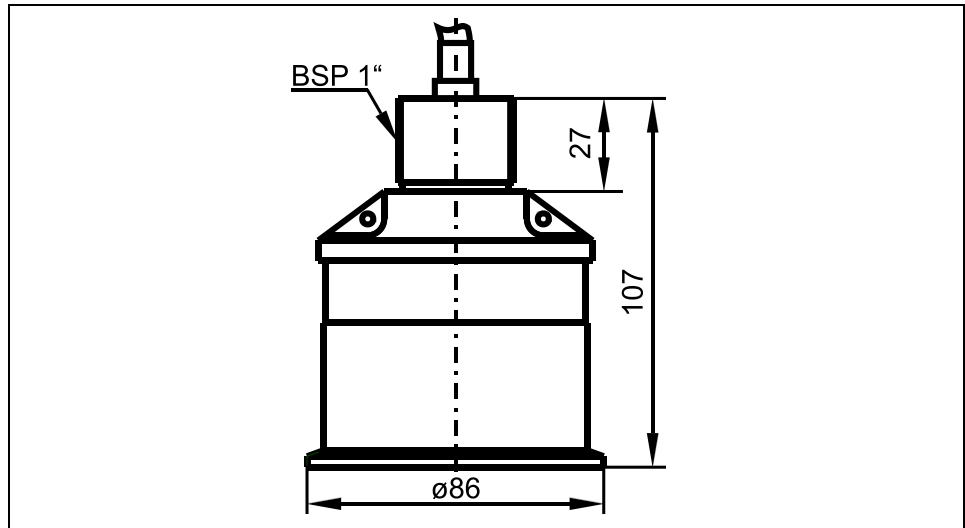


Fig. 6-3 P 06 and P 10 ultrasonic sensor dimensions

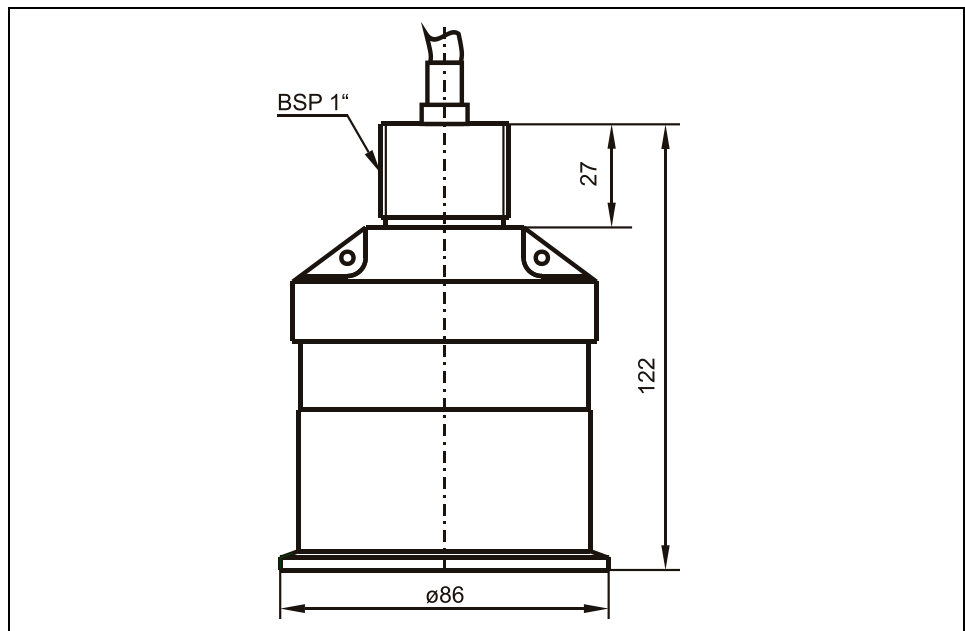


Fig. 6-4 P 15 ultrasonic sensor dimensions

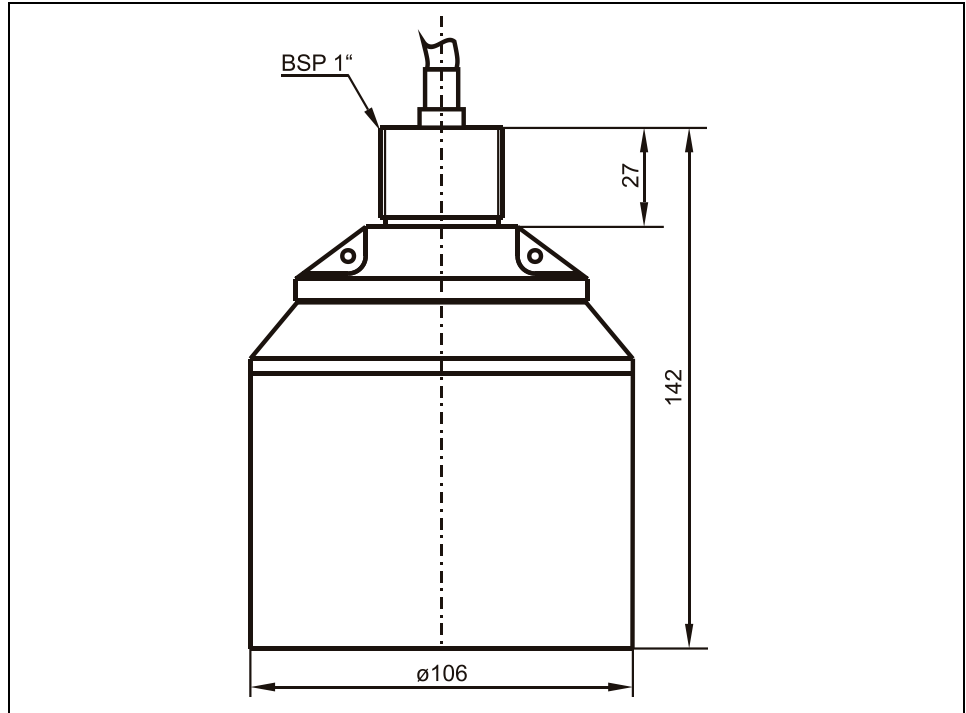


Fig. 6-5 P 25 ultrasonic sensor dimensions

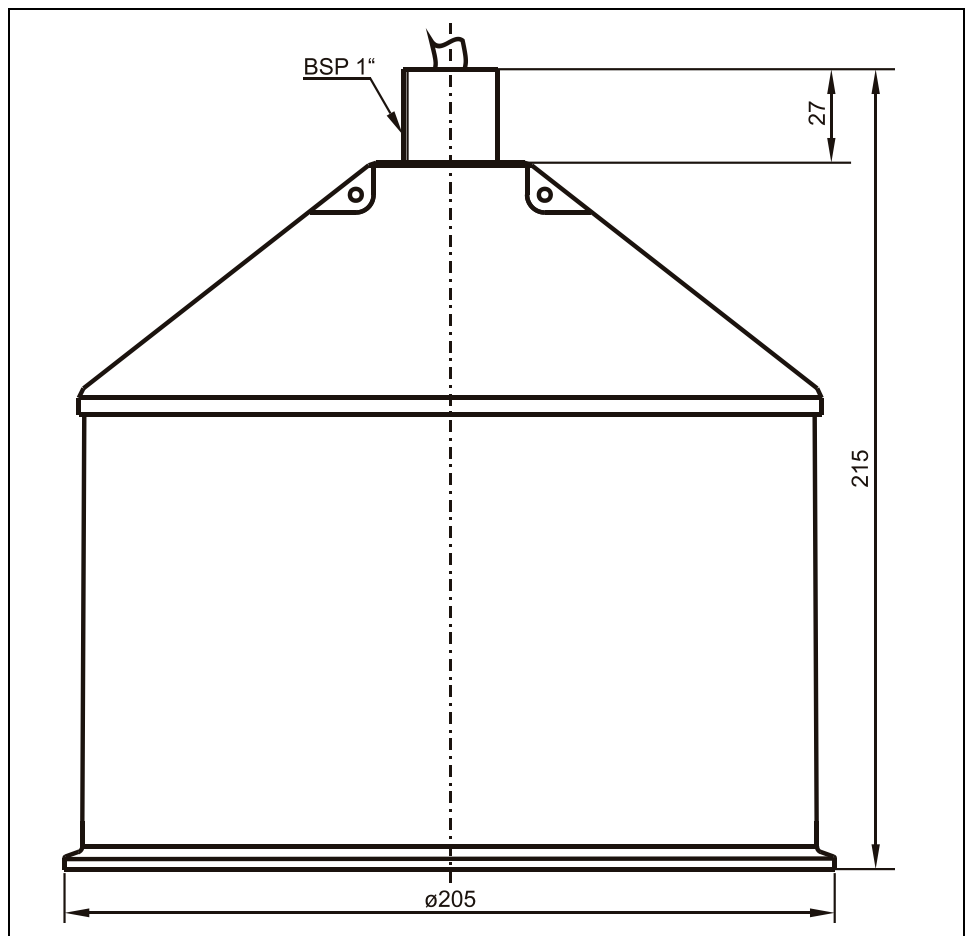


Fig. 6-6 P 40 ultrasonic sensor dimensions

### 6.2.3 Sensor Installation

During sensor installation please observe the following:

- Always ensure direct visibility between sensor face and the medium to be measured. Keep off obstructions, weld seams, fills and similar whenever possible. It is possible to mask out disturbances, however it makes more sense to avoid disturbances at all.
- Select the mounting place in a way to comply with the near blanking distance if the maximum fill level has been reached. Measuring within the blanking distance area is not possible as this will cause faulty results.
- The sensor must be fixed (e.g. by using a mounting angle) instead of being suspended from the cable. Otherwise the sensor might swing resulting in faulty echo reception.
- Tighten the sensor manually if using the 1" thread. Do not use any tools (such as pliers).

The sensor should not be screwed directly into metal. In this case we recommend to use an insulation kit (order separately).



---

*This concerns the thread on the cable side of the P 03. Never screw the front-side thread of the P-03 directly into metal.*

---

If using a junction box please make sure to use cable glands which ensure the required minimum protection rating.

Lock unused cable inlets with appropriate dummy plugs before initial start-up.

Use a 3-wire shielded cable (without PE) as extension. During transmitter as well as sensor installation please observe to comply with the specified enclosure protection ratings. Electronic defects caused by dust or moisture due to improper installation void all warranty claims.



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*Before the first connection it is necessary to have a slight pressure on the screw of the clamping connection to ensure safe opening and a correct connection..*

---



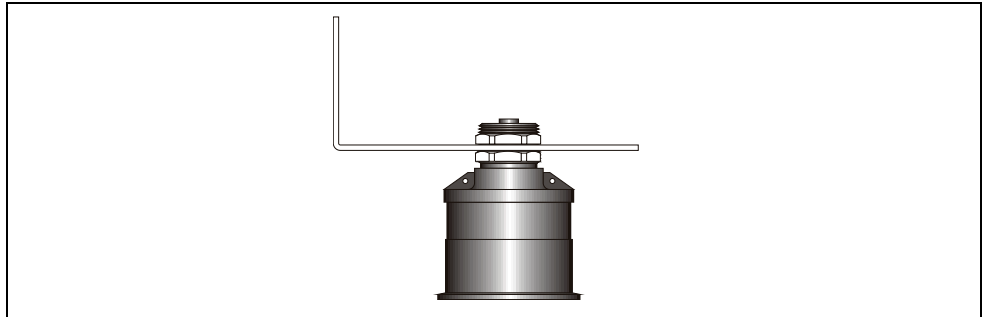
---

*Water or dirt must not leak into the terminal housing. Please seal the housing with the supplied lid and both screws respectively. Especially note non-reversed cover position. Incorrect or faulty sealing does not ensure the indicated protection.*

---

### Mounting on wall bracket

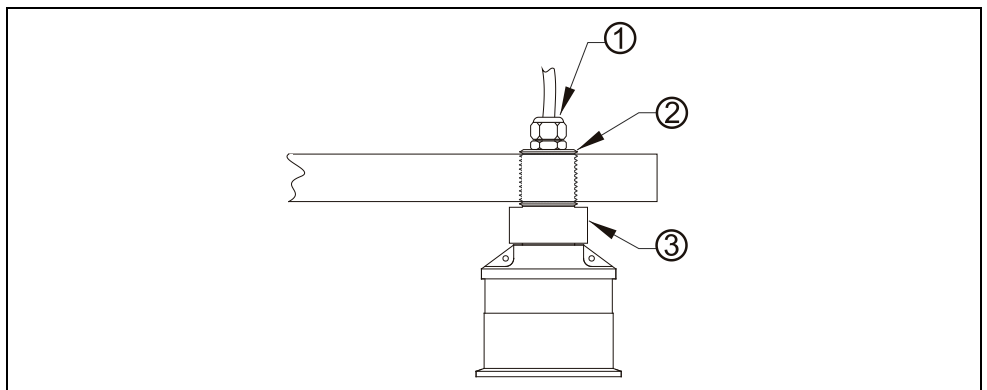
Fasten the sensor by using two 1" screw nuts.  
The 1" PVC screw nuts are part of the standard delivery.



**Fig. 6-7** Sensor on wall bracket

### Installation with Isolation Set

If you wish to screw the sensor directly into a 1" metal thread we recommend to use an insulation kit (order separately).  
This helps to avoid ringing effects at temperatures below 0 °C (32 °F).

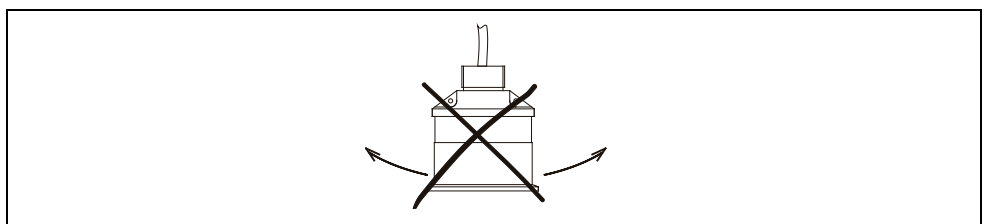


- 1 Isolating set (PG)
- 2 Metal sleeve
- 3 Isolating set

**Fig. 6-8** Installation using insulation kit



*Do not install the sensor in a suspended way. Use an appropriate strain relief (e.g. chain) for this kind of installation. Please ensure to avoid pendular movement of the sensor.*

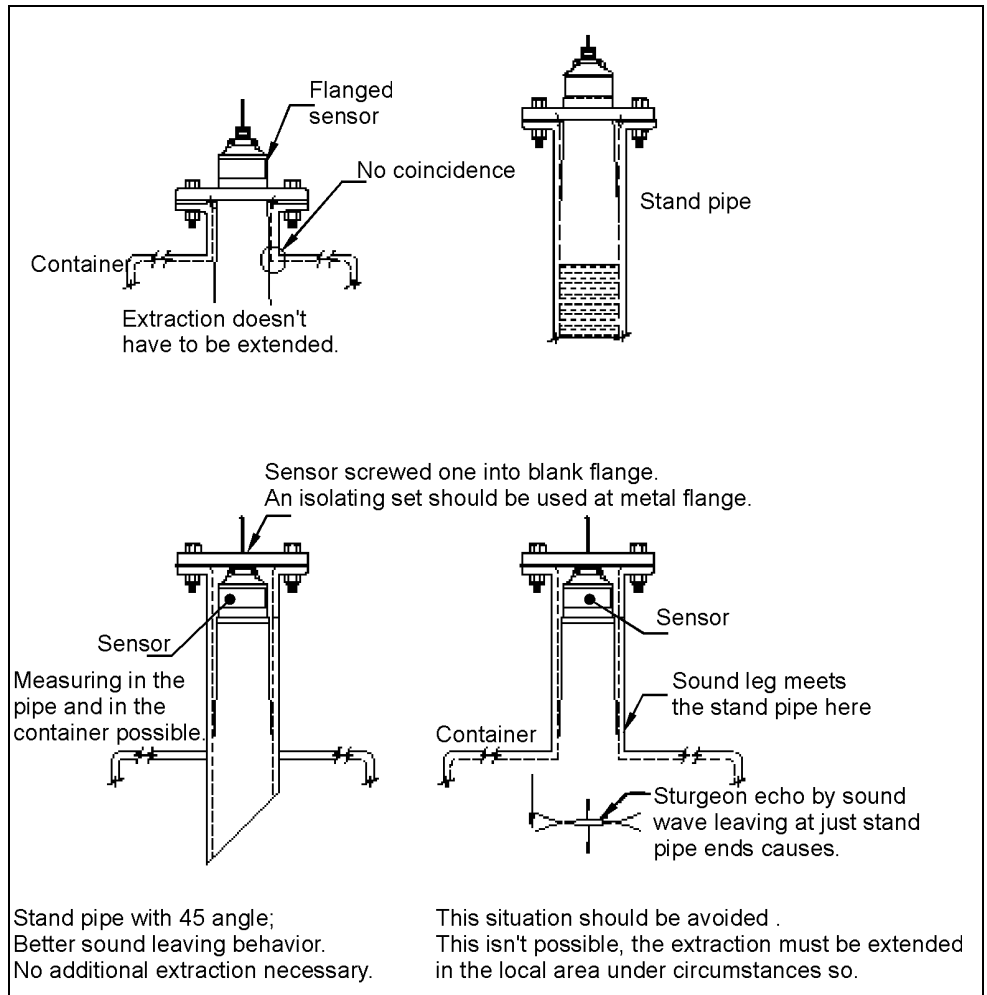


Avoiding pendular movement

**Fig. 6-9** Sensor suspended from cable

**Installation in standpipe**

Numerous applications require to install the measurement in a standpipe. In these cases it is possible to install a sensor with a factory-made flange or a sensor in a dummy flange. In principle, the sensor blanking area shall be adhered to in case of maximum tank or basin filling level.



**Fig. 6-10 Sensor installation in standpipe**

### Installation with align fixture

An align fixture shall be used for installation in bulk applications where formation of angles of repose and/or removal hoppers might occur.

This enables the best possible sensor adjustment to the material.



**Fig. 6-11** Sensor with align fixture



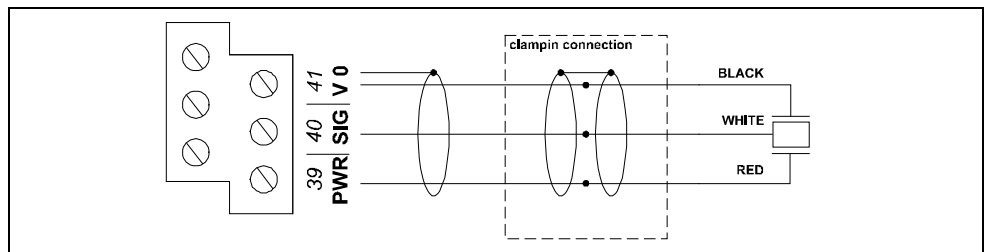
*Never run the cable slackly or uncovered! Risk of sensor or cable tear-off!*  
*Do not sharply bend the cable due to the risk of cable break!*

### 6.2.4 Sensor Connection



*Inappropriate connections or the use of improper cables might cause errors or lead to measurement failures.*

Connect the sensor at the respective transmitter terminal clamps according to the wiring diagram depicted below:



**Fig. 6-12** Connecting a P-Series ultrasonic sensor

In order to extend the sensor line use a shielded 3-wire cable (e.g. LIYCY 3 x 0.75 mm<sup>2</sup>).

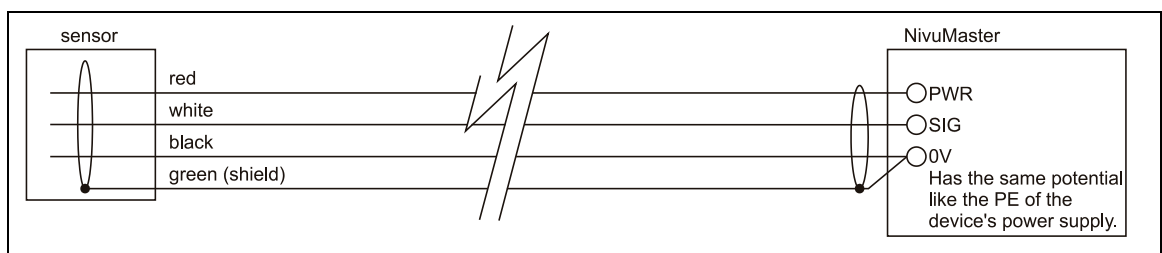


**Please note:**

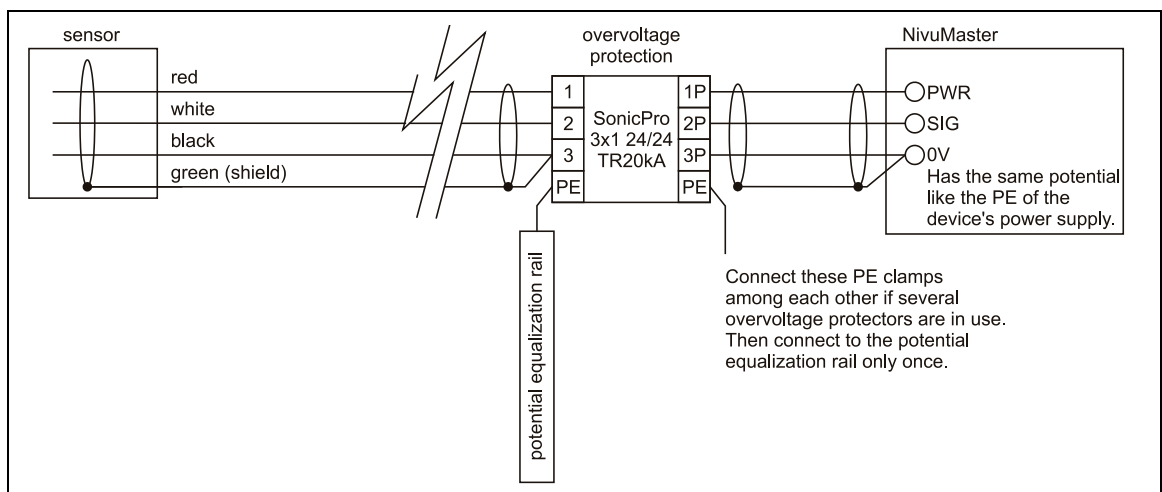
- we recommend to route the sensor line directly to the NivuMaster without using additional clamps within the switching cabinet.
- Do not lay several sensor lines in a multi-core cable. Each sensor cable shall be laid separately.
- Lay sensor cables isolated from power lines and frequency-controlled motor lines.
- It is possible to extend the sensor cable up to 800 m. Please always keep in mind that in case of voltage drops there is a minimum voltage of 18 V DC left for sensor supply.  
The resistance of single wires shall not exceed 30 Ohm.

### 6.3 Overvoltage Protection Precautions

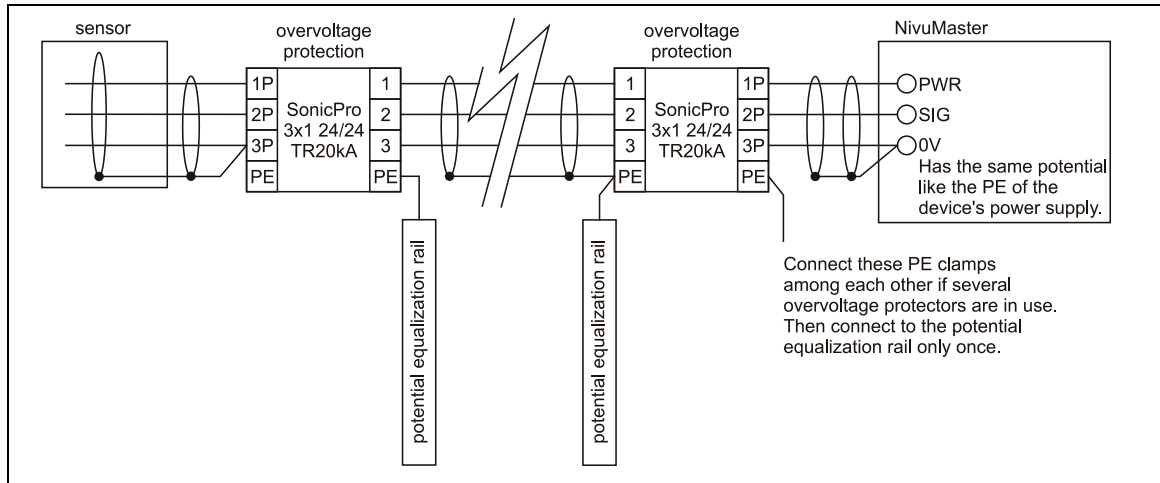
For efficient sensor protection it is necessary to use overvoltage protection units on both sides if required.  
NIVUS recommends for sensor as well as for transmitter side overvoltage protection units Type SonicPro.



**Fig. 6-13 Lines without overvoltage protection**



**Fig. 6-14 Overvoltage protection on transmitter side**



**Fig. 6-15 Overvoltage protection on transmitter and sensor side**



*Please observe the non-reversed connection of the SonicPro (p-side towards the side to be protected) as well as a correct, straight wiring supply. Ground (earth) must lead to the unprotected side*

## 7 Initial start-up

### 7.1 General

#### Notes to the user

Before you connect and operate the NivuMaster sensor you should strictly follow the notes below!

This instruction manual contains all necessary information to program and to operate the device, addressing qualified technical staff who have appropriate knowledge about measurement technology, automation technology, information technology and waste water hydraulics.

To ensure a correct function of the NivuMaster sensor this instruction manual must be read thoroughly!

The NivuMaster sensor must be wired in accordance with the wiring diagram (Fig. 6-12)!

If any problems regarding installation, connection or programming should occur please contact our technical division or our service centre.

#### General Principles

The initial start-up is not allowed until the installation has been finished and checked.

To exclude faulty programming this instruction manual must be read before the initial start-up.

## 8 Troubleshooting

Error	Possible Reason	Correction
Sensor error	Connection	Check connection at terminal clamp.
	Sensor installation	Check installation. Risk of echo loss as soon as the sensor position is at an angle to the reflecting surface or in a place tending to foam/wave formation.
	Projecting edge	Check installation. Risk of faulty measurement if the sensor is in a position where (a) projecting edge(s) cause additional reflections.
	Transmitter	Check supply voltage

## 9 Table of Resistiveness

The NivuMaster sensors are resistant to normal domestic sewages, dirt and rain water as well as mixed water from municipalities and communities. The sensors nevertheless are not resistant to all substances and substance mixtures.

**As a basic principle, damage might occur in case of using chloride media as well as various organic solvents!**

Please observe that substance mixtures (several substances being present simultaneously) under certain circumstances may cause catalytic effects which might not occur if the individual substances are in use. Due to infinitely possible combinations these catalytic effects cannot be verified entirely.

## 10 Maintenance and Cleaning

During standard use the NivuMaster sensor does not get in contact with the measurement medium and therefore is virtually maintenance-free. If the sensor face however should get dirty due to medium contact (immersion) or ambient conditions (dust) clean the sensor face carefully with a damp cloth.

Never use aggressive cleansing agents (such as thinner). For heavy pollution NIVUS recommends the use of surface-active agents. The use of abrasive cleansing agents is not allowed.



*If you wish to clean or dismantle the sensor please disconnect the unit from mains before.*



*No hard objects such as wire brushes, rods, scrapers or similar shall be used to clean the sensor. Using a high pressure cleaner may lead to sensor damage and measurement failures and thus is not allowed.*

In various countries it may be necessary to carry out regular maintenance with comparative measurements in particular applications to comply with official regulations. If desired, NIVUS is going to carry out all required verifications, hydraulic and technical assessment, calibration, troubleshooting and repairs if an according maintenance agreement has been contracted. These services will be carried out according to DIN 19559 incl. the agreed proof of the remaining residual error, as well as according to rules in the respective countries.

## 11 Emergency

In case of emergency

- press the emergency-off button of the main system or
- set the slide switch on the unit to OFF.

## 12 Dismantling/Disposal

The device shall be disposed according to the local regulations for electronic products.

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# EU Konformitätserklärung

*EU Declaration of Conformity*

*Déclaration de conformité UE*

NIVUS GmbH  
Im Täle 2  
75031 Eppingen

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Telefax: +49 07262 9191-999  
E-Mail: info@nivus.com  
Internet: www.nivus.de

Für das folgend bezeichnete Erzeugnis:

*For the following product:*

*Le produit désigné ci-dessous:*

<b>Bezeichnung:</b>	<b>Ultraschallsensor P-Serie</b>
<i>Description:</i>	<i>P series of ultrasonic transducers</i>
<i>Désignation:</i>	<i>Capteurs ultrasoniques de la série</i>
<b>Typ / Type:</b>	<b>NMS-P...</b>

erklären wir in alleiniger Verantwortung, dass die auf dem Unionsmarkt ab dem Zeitpunkt der Unterzeichnung bereitgestellten Geräte die folgenden einschlägigen Harmonisierungsvorschriften der Union erfüllen:

*we declare under our sole responsibility that the equipment made available on the Union market as of the date of signature of this document meets the standards of the following applicable Union harmonisation legislation:*

*nous déclarons, sous notre seule responsabilité, à la date de la présente signature, la conformité du produit pour le marché de l'Union, aux directives d'harmonisation de la législation au sein de l'Union:*

- 2014/30/EU
- 2011/65/EU

Bei der Bewertung wurden folgende einschlägige harmonisierte Normen zugrunde gelegt bzw. wird die Konformität erklärt in Bezug die nachfolgend genannten anderen technischen Spezifikationen:

*The evaluation assessed the following applicable harmonised standards or the conformity is declared in relation to other technical specifications listed below:*

*L'évaluation est effectuée à partir des normes harmonisées applicable ou la conformité est déclarée en relation aux autres spécifications techniques désignées ci-dessous:*

EN 61326-1:2013

Diese Erklärung wird verantwortlich für den Hersteller:

*This declaration is submitted on behalf of the manufacturer:*

*Le fabricant assume la responsabilité de cette déclaration:*

**NIVUS GmbH**  
**Im Täle 2**  
**75031 Eppingen**  
**Allemagne**

abgegeben durch / *represented by / faite par:*

**Ingrid Steppe** (Geschäftsführerin / *Managing Director / Directeur général*)

Eppingen, den 13.08.2018

Gez. *Ingrid Steppe*

## UK Declaration of Conformity

For the following product:

**Description:** P series of ultrasonic transducers

**Type:** NMS-P...

we declare under our sole responsibility that the equipment made available on the UK market as of the date of signature of this document meets the standards of the following applicable UK harmonisation legislation:

- SI 2016 / 1091 The Electromagnetic Compatibility Regulations 2016
- SI 2012 / 3032 The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

The evaluation assessed the following applicable harmonised standards or the conformity is declared in relation to other technical specifications listed below:

- BS EN 61326-1:2013

This declaration is submitted on behalf of the manufacturer:

**NIVUS GmbH**  
**Im Tale 2**  
**75031 Eppingen**  
**Germany**

represented by:

**Ingrid Steppe** (Managing Director)

Eppingen, 21/10/2022

Signed by *Ingrid Steppe*





# UK Declaration of Conformity

NIVUS GmbH  
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Telefax: +49 07262 9191-999  
E-Mail: info@nivus.com  
Internet: www.nivus.de

For the following product:

<b>Description:</b>	<b>"Ex" P Series of ultrasonic transducers</b>
<b>Type:</b>	<b>NMS-PxxxxxZ... <sup>1)</sup> / NMS-PxxxxxE... <sup>2)</sup></b>



we declare under our sole responsibility that the equipment made available on the UK market as of the date of signature of this document meets the standards of the following applicable UK harmonisation legislation:

- SI 2016 / 1107 The Equipment and Protective Systems Intended for use in Potentially Explosive Atmospheres Regulations 2016
- SI 2016 / 1101 The Electrical Equipment (Safety) Regulations 2016
- SI 2016 / 1091 The Electromagnetic Compatibility Regulations 2016
- SI 2012 / 3032 The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

The evaluation assessed the following applicable harmonised standards or the conformity is declared in relation to other technical specifications listed below:

- BS EN 60079-0:2018
- BS EN 60079-11:2012 <sup>1)</sup> only
- BS EN 61010-1:2010 + A1:2019 + A1:2019/AC:2019
- BS EN 60079-18:2015 + A1:2017 <sup>2)</sup> only
- BS EN 61326-1:2013

Ex-designation:

 II 1GD Ex ia IIC T6 (T<sub>amb</sub> = -40°C to +75°C) <sup>1)</sup>  
 II 2GD Ex m II T6 (T<sub>amb</sub> = -40°C to +75°C) <sup>2)</sup>

EU-Type Examination Certificate:

Sira 03ATEX2278X Issue: 2 <sup>1)</sup>  
Sira 03ATEX5277X Issue: 2 <sup>2)</sup>

Notified Body (Identif. No.):

CSA Group Netherlands B.V., Utrechtseweg 310, Building B42, 6812AR, Netherlands (2813)

Quality Assurance Ex:

TÜV Nord CERT GmbH, Am TÜV 1, 45307 Essen, Germany (0044)

This declaration is submitted on behalf of the manufacturer:

**NIVUS GmbH**  
**Im Tale 2**  
**75031 Eppingen**  
**Germany**

represented by:

**Ingrid Steppe** (Managing Director)

Eppingen, 21/10/2022

Signed by *Ingrid Steppe*



1 **EU TYPE-EXAMINATION CERTIFICATE**

2 Equipment intended for use in Potentially Explosive Atmospheres Directive 2014/34/EU

3 Certificate Number: **Sira 03ATEX2278X** Issue: **2**

4 Equipment: **Nivus P Series of Ultrasonic Transducers**

5 Applicant: **Nivus GmbH**

6 Address: **Im Tale 2  
D-75031  
Eppingen  
Germany**

7 This equipment and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

8 CSA Group Netherlands B.V., notified body number 2813 in accordance with Articles 17 and 21 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in the confidential reports listed in Section 14.2.

9 Compliance with the Essential Health and Safety Requirements, with the exception of those listed in the schedule to this certificate, has been assured by compliance with the following documents:

EN 50014:1997 plus Amendments 1 and 2      EN 50 028:1987

10 If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to specific conditions of use specified in the schedule to this certificate.

11 This EU type-examination certificate relates only to the design and construction of the specified equipment. If applicable, further requirements of this Directive apply to the manufacture and supply of this equipment.

12 The marking of the equipment shall include the following:



II 1GD  
EEx ia IIC T6 (Tamb = -40°C to +75°C)

Project Number 80066900

Signed: J A May

Title: Director of Operations

CSA Group Netherlands B.V.  
Utrechtseweg 310, Building B42,  
6812AR, Netherlands



## SCHEDULE

### EU-TYPE EXAMINATION CERTIFICATE

Sira 03ATEX2278X  
Issue 2

#### 13 DESCRIPTION OF EQUIPMENT

The Nivus P Series of Ultrasonic Level Sensors are designed as level measurement sensors used in level measurement systems. The sensors in the series differ only in the size of transducer crystal used and the frequency of operation.

The equipment comprises a printed circuit board and a piezo electric crystal transducer, these are all housed inside a plastic enclosure and then totally encapsulated. An integral cable provides the connection facilities to the external circuits.

The equipment has been assessed with the following input parameters:

$U_i$	=	30 V
$I_i$	=	0.6 A
$P_i$	=	1.5 W
$C_i$	=	0
$L_i$	=	0

**Variation 1** - This variation introduced the following changes:

- To permit the P Series of Ultrasonic Transducers to be extended to include the model P 25.
- To allow the amendment of the label to include additional information that is not ratified by Sira.

**Variation 2** - This variation introduced the following change:

- To recognise the inclusion of the Model P 40 into the range of Pulsar P Series of Ultrasonic Level Sensors.

**Variation 3** - This variation introduced the following changes:

- The recognition of modifications to the printed circuit board (PCB) for form a P Mk2 circuit board.
- To permit the use of the dB Mk2 circuit board in all previous models within the P series of Ultrasonic Level Sensors.
- The inclusion of the Model dB6 Mk2, standard, and the dB6 Mk2, threaded nose versions into the range of Nivus P Series of Ultrasonic Level Sensors.

**Variation 4** - This variation introduced the following changes:

- The introduction of minor changes to the printed circuit board and parts list.

**Variation 5** - This variation introduced the following changes:

- To allow the enclosure used in the construction of the sensor to be made from an alternative, plastic material.

**Variation 6** - This variation introduced the following changes:

- The recognition of the P-40 version of the equipment.

#### 14 DESCRIPTIVE DOCUMENTS

##### 14.1 Drawings

Refer to Certificate Annexe.

CSA Group Netherlands B.V.  
Utrechtseweg 310, Building B42,  
6812AR, Netherlands



## SCHEDULE

### EU-TYPE EXAMINATION CERTIFICATE

Sira 03ATEX2278X  
Issue 2

#### 14.2 Associated Sira Reports and Certificate History

Issue	Date	Report number	Comment
0	19 August 2003	52V1034	The release of the prime certificate.
1	12 May 2009	R52A19911A	This Issue covers the following changes: <ul style="list-style-type: none"><li>All previously issued certification was rationalised into a single certificate, Issue 1, Issue 0 referenced above is only intended to reflect the history of the previous certification and has not been issued as a document in this format.</li><li>The rationalisation of this certificate with the one identified at section 14.3.</li><li>The introduction of Variation 6.</li></ul>
2	21 December 2020	R80066900A	This Issue covers the following changes: <ul style="list-style-type: none"><li>EC-Type Examination Certificate in accordance with 94/9/EC updated to EU-Type Examination Certificate in accordance with Directive 2014/34/EU. <i>(In accordance with Article 41 of Directive 2014/34/EU, EC-Type Examination Certificates referring to 94/9/EC that were in existence prior to the date of application of 2014/34/EU (20 April 2016) may be referenced as if they were issued in accordance with Directive 2014/34/EU. Variations to such EC-Type Examination Certificates may continue to bear the original certificate number issued prior to 20 April 2016.)</i></li><li>Transfer of certificate Sira 03ATEX2278X from Sira Certification Service to CSA Group Netherlands B.V..</li></ul>

14.3 Certificate number Sira 02ATEX2103X Issue 8.

#### 15 SPECIFIC CONDITIONS OF USE (denoted by X after the certificate number)

15.1 Under certain extreme circumstances, the non-metallic parts incorporated in the enclosure of this equipment may generate an ignition-capable level of electrostatic charge. Therefore, when it is used for applications that specifically require group II, category 1 equipment, the equipment shall not be installed in a location where the external conditions are conducive to the build-up of electrostatic charge on such surfaces. Additionally, the equipment shall only be cleaned with a damp cloth.

#### 16 ESSENTIAL HEALTH AND SAFETY REQUIREMENTS OF ANNEX II (EHSRs)

The relevant EHSRs that are not addressed by the standards listed in this certificate have been identified and individually assessed in the reports listed in Section 14.2.

#### 17 CONDITIONS OF MANUFACTURE

17.1 The use of this certificate is subject to the Regulations Applicable to Holders of CSA Certificates.

17.2 Holders of EU-Type Examination Certificates are required to comply with the conformity to type requirements defined in Article 13 of Directive 2014/34/EU.

17.3 This product shall be uniquely marked with the labels identified in the annexe of this certificate.

CSA Group Netherlands B.V.  
Utrechtseweg 310, Building B42,  
6812AR, Netherlands

# Certificate Annexe



Certificate Number: Sira 03ATEX2278X  
Equipment: Nivus P Series of Ultrasonic Transducers  
Applicant: Nivus GmbH

---

## Issue 0

Drawing No.	Rev.	Sheet	Date	Title
D-804-0543-C	C	1 of 1	04 Aug 03	Nivus P3, 6, 10 & 15 Transducer labels
D-804-0544-C	C	1 of 1	04 Aug 03	Nivus P25 transducer label
D-804-0551-B	B	1 of 1	27 May 03	Nivus ATEX Label

## Issue 1

Drawing	Rev.	Sheets	Date (Sira stamp)	Title
D-804-0696-A	A	1 of 1	15 Apr 09	Nivus Transducer Wraparound Labels for 40m Transducer

Issue 2 – No new drawings were introduced.

CSA Group Netherlands B.V.  
Utrechtseweg 310, Building B42,  
6812AR, Netherlands



1 **EU TYPE-EXAMINATION CERTIFICATE**

2 Equipment intended for use in Potentially Explosive Atmospheres Directive 2014/34/EU

3 Certificate Number: **Sira 03ATEX5277X** Issue: **2**

4 Equipment: **Nivus P Series of Ultrasonic Transducers**

5 Applicant: **Nivus GmbH**

6 Address: **Im Tale 2  
D-75031  
Eppingen  
Germany**

7 This equipment and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

8 CSA Group Netherlands B.V., notified body number 2813 in accordance with Articles 17 and 21 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in the confidential reports listed in Section 14.2.

9 Compliance with the Essential Health and Safety Requirements, with the exception of those listed in the schedule to this certificate, has been assured by compliance with the following documents:

EN 50014:1997 plus Amendments 1 and 2      EN 50 028:1987

10 If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to specific conditions of use specified in the schedule to this certificate.

11 This EU type-examination certificate relates only to the design and construction of the specified equipment. If applicable, further requirements of this Directive apply to the manufacture and supply of this equipment.

12 The marking of the equipment shall include the following:



II 2GD  
EEx m II T6 (Tamb = -40°C to +75°C)

Project Number 80066900

Signed: J A May

Title: Director of Operations

CSA Group Netherlands B.V.  
Utrechtseweg 310, Building B42,  
6812AR, Netherlands



## SCHEDULE

### EU-TYPE EXAMINATION CERTIFICATE

Sira 03ATEX5277X  
Issue 2

#### 13 DESCRIPTION OF EQUIPMENT

The Nivus P Series of Ultrasonic Level Sensors are designed as level measurement sensors used in level measurement systems. The sensors in the series differ only in the size of transducer crystal used and the frequency of operation. The equipment comprises a printed circuit board and a piezo electric crystal transducer; these are all housed inside a plastic enclosure and then totally encapsulated. An integral cable provides the connection facilities to the external circuits.

The sensors have been assessed with the following input parameters:

Rated input voltage = 24 V  
Maximum input power = 1.5 W

The sensors have no internal fuse or any other components that will guarantee its suitability for connection to a prospective short circuit current of 4000A. Such components must be provided in the external equipment to which the sensors are to be connected.

**Variation 1** - This variation introduced the following change:

- i. The inclusion of the Model P 40 into the range of Pulsar dB Series of Ultrasonic Level Sensors.

**Variation 2** - This variation introduced the following changes:

- i. Modifications to the printed circuit board (PCB) to form a dB Mk2 circuit board.
- ii. To permit the use of the dB Mk2 circuit board in all previous models within the P series of Ultrasonic Level Sensors.
- iii. The inclusion of the Model P 6 Mk2, standard, and the P 6 Mk2, threaded nose versions into the range of Nivus P Series of Ultrasonic Level Sensors.

**Variation 3** - This variation introduced the following change:

- i. The introduction of minor changes of the printed circuit board and parts list.

**Variation 4** - This variation introduced the following change:

- i. To permit the enclosure used in the construction of the sensor to be made from an alternative, plastic material.

**Variation 5** - This variation introduced the following changes:

- i. An alternative PCB design (db Burst Drive) to be used in the existing P transducer range.
- ii. A different method for the connection of the cable screen to earth.
- iii. A change of details regarding the encapsulation used for the piezo section of the design.

**Variation 6** - This variation introduced the following changes:

- i. The recognition of the P-40 version of the equipment.

#### 14 DESCRIPTIVE DOCUMENTS

##### 14.1 Drawings

Refer to Certificate Annexe.

CSA Group Netherlands B.V.  
Utrechtseweg 310, Building B42,  
6812AR, Netherlands



## SCHEDULE

### EU-TYPE EXAMINATION CERTIFICATE

Sira 03ATEX5277X  
Issue 2

#### 14.2 Associated Sira Reports and Certificate History

Issue	Date	Report number	Comment
0	19 August 2003	52V10349	The release of the prime certificate.
1	12 May 2009	R52A19911A	This Issue covers the following changes: <ul style="list-style-type: none"><li>All previously issued certification was rationalised into a single certificate, Issue 1, Issue 0 referenced above is only intended to reflect the history of the previous certification and has not been issued as a document in this format.</li><li>The rationalisation of this certificate with the one identified at section 14.3.</li><li>The introduction of Variation 6.</li></ul>
2	22 December 2020	R80066900A	This Issue covers the following changes: <ul style="list-style-type: none"><li>EC-Type Examination Certificate in accordance with 94/9/EC updated to EU-Type Examination Certificate in accordance with Directive 2014/34/EU. <i>(In accordance with Article 41 of Directive 2014/34/EU, EC-Type Examination Certificates referring to 94/9/EC that were in existence prior to the date of application of 2014/34/EU (20 April 2016) may be referenced as if they were issued in accordance with Directive 2014/34/EU. Variations to such EC-Type Examination Certificates may continue to bear the original certificate number issued prior to 20 April 2016.)</i></li><li>Transfer of certificate Sira 03ATEX5277X from Sira Certification Service to CSA Group Netherlands B.V..</li></ul>

14.3 Certificate number Sira 02ATEX5104X Issue 9.

#### 15 SPECIFIC CONDITIONS OF USE (denoted by X after the certificate number)

15.1 The encapsulated Type 'm' sensors in the series must be supplied from apparatus that provides protection against prospective short circuit currents of up to 4000A.

#### 16 ESSENTIAL HEALTH AND SAFETY REQUIREMENTS OF ANNEX II (EHSRs)

The relevant EHSRs that are not addressed by the standards listed in this certificate have been identified and individually assessed in the reports listed in Section 14.2.

#### 17 CONDITIONS OF MANUFACTURE

17.1 The use of this certificate is subject to the Regulations Applicable to Holders of CSA Certificates.

17.2 Holders of EU-Type Examination Certificates are required to comply with the conformity to type requirements defined in Article 13 of Directive 2014/34/EU.

17.3 This product shall be uniquely marked with the labels identified in the Annexe of this certificate

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# Certificate Annexe



Certificate Number: Sira 03ATEX5277X  
Equipment: Nivus P Series of Ultrasonic Transducers  
Applicant: Nivus GmbH

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## Issue 0

Drawing No.	Rev.	Sheet	Date	Title
D-804-0543-C	C	1 of 1	04 Aug 03	Nivus P3, 6, 10 & 15 Transducer labels
D-804-0544-C	C	1 of 1	04 Aug 03	Nivus P25 transducer label
D-804-0551-B	B	1 of 1	27 May 03	Nivus ATEX Label

## Issue 1

Drawing	Rev.	Sheets	Date (Sira stamp)	Title
D-804-0696-A	A	1 of 1	15 Apr 09	Nivus Transducer Wraparound Labels for 40m Transducer

Issue 2 – No new drawings were introduced.

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