

**Instruction manual for
Pressure and Level Sensors:
NivuBar Plus II, NivuBar G II, NivuBar H III,
HydroBar G II, UniBar E II, AquaBar II**



rev. 09 / 12.10.2017

Original Instruction Manual – German / rev. 09 / 20.03.2017

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Translation

If the device is sold to a country in the European Economic Area (EEA) this instruction manual 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 manual (German) must be consulted or the manufacturer contacted for clarification.

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Names

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1 General

***Important******READ CAREFULLY BEFORE USE!******KEEP IN A SAFE PLACE FOR LATER REFERENCE.***

Read this instruction manual carefully and completely prior to installation and connection since it contains relevant information on this product. Observe the notes and particularly follow the warning notes and safety instructions.

This Instruction Manual for Pressure and Level Sensors is intended for the initial start-up or the connection of the sensors and probes depicted on the title page to NIVUS transmitters.

This Instruction Manual is part of the pressure and level sensor standard delivery and shall be available to users at any time. The safety instructions contained therein must be followed.

Keep this manual in a safe place and make sure it is available for the users of this product at any time.

In case of selling the sensors this instruction manual shall be provided to the purchaser.

If you should have problems to understand information contained within this instruction manual either contact the manufacturer or one of the distributors for further support. The manufacturer cannot be held responsible for damage to persons or material due to incorrectly understood information in this instruction.

Detailed information on how to operate the pressure and level sensors in connection with NIVUS transmitters can be found in the accompanying transmitter instruction manual.

Personnel requirements

Installation, commissioning and maintenance shall be executed only by personnel meeting the demands as follows:

- Expert personnel with relevant training and appropriate qualification
- Personnel authorised by the plant operator



Qualified personnel

within the context of this documentation or the safety notes on the product itself are persons who are sufficiently familiar with installation, mounting, starting up and operation of the product and who have the relevant qualifications for their work; for example:

- *Training, instruction or authorisation to activate/deactivate, isolate, ground, and mark electric circuits and devices/systems according to the safety engineering standards.*
 - *Education and instruction according to the standards of safety engineering regarding the maintenance and use of adequate safety equipment.*
 - *First aid training*
-

Applicable documentation

For the installation and operation of the complete system extra instruction manuals or technical descriptions may be required apart from this manual.

- Instruction Manual for the Transmitter NivuCont Plus
- Instruction Manual for the Transmitter NivuCont S

These manuals are provided with the auxiliary units or sensors and/or are available as download on the NIVUS homepage.

2 Safety Instructions

2.1 Used symbols and signal words



The general warning symbol indicates the risk of personal injuries or death. In the text section the general warning symbol is used in conjunction with the signal words described below.

DANGER

Warnings against personal damage



Indicates a high-risk, imminently hazardous situation which will result in death or serious injury if not avoided.

DANGER

Danger by electric voltage



Indicates a hazard with a high risk of electric shock which may result in a life-threatening situation or severe bodily injury if it is not avoided.

WARNING

Warnings against personal injury



Indicates a possible danger with medium risk which may result in a life-threatening situation or (severe) bodily injury if it is not avoided.

CAUTION

Warnings in low-risk or property damages



Indicates a possible danger with moderate risk which may result in minor or moderate personal injury or material damage if not avoided.



Important Note

Indicates a situation which may result in damage at this instrument if not avoided.

Contains information that should be highlighted.



Note

Indicates a situation which not results in personal injury.

2.2 Safeguards and Precautions

WARNING



Germ contamination

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

Wear protective clothing.

WARNING



Observe occupational safety regulations

Before starting installation work, observing the work safety regulations need to be checked.

Disregarding may lead in personal injury.

WARNING



Do not disable safety devices

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

Disregarding may lead in personal injury.



Important Note

The entire measurement system shall be installed and put into operation only by trained expert personnel.

2.3 Liability disclaimer

The manufacturer reserves the right to change the contents of this document including this liability disclaimer without prior notice and cannot be held responsible in any way for possible consequences resulting from such changes.

For connection, initial start-up and operation as well as maintenance of the unit the following information and higher legal regulations of the respective country (in Germany e. g. VDE regulations) such as applicable Ex regulations as well as safety requirements and regulations in order to avoid accidents shall be observed.

The sensors have been constructed considering the standards EN 60079-0, EN 60079-11 and EN 60079-26.

The safety-related values of pressure/level probes shall be compatible with the values as specified in the technical data or the Ex approval/EG type examination certificate.

Interconnecting more than one active equipment unit within one intrinsically safe circuit may result in different safety-related values. This may impair intrinsic safety!

All operations on the device which go beyond installation or connection measures in principle shall be carried out by NIVUS staff or personnel authorised by NIVUS due to reasons of safety and guarantee.

Operate the Pressure and Level Sensors only in technically perfect working order.

Improper Use

Not being operated in accordance with the requirements may impair the safety. The manufacturer is not responsible for failures resulting from improper use.

2.4 User's Responsibilities



Important Note

In the EEA (European Economic Area) national implementation of the frame-work directive 89/391/EEC and corresponding individual directives, in particular the directive 2009/104/EC 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.

Make sure to have a **local operating permit** available and observe the associated conditions.

In addition to this you must observe environmental requirements and local laws on the following points.

- Personnel safety (accident prevention regulations)
- 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 requirements

Connections

Operators shall make sure prior to operating the Pressure and Level Sensors that during installation and initial start-up the local regulations (such as regulations for electrical connection) are observed.

3 Overview and use in accordance with the requirements

3.1 Overview



- 1 NivuBar Plus II
- 2 NivuBar G II
- 3 NivuBar H III
- 4 HydroBar G II
- 5 AquaBar II
- 6 AquaBar BS
- 7 UniBar E II (stainless steel enclosure)
- 8 UniBar E II (with plug)

Fig. 3-1 Overview of pressure and level sensors

3.2 Use in accordance with the requirements



Note

*The sensors for pressure and level measurement are 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 sensors are used for pressure and level measurements (depending on type, i. e. submersible or screw-in sensor). Here the allowed maximum values, as specified in chapter "4 Technical Data", must be strictly kept. All cases which vary from these conditions and are not passed by NIVUS GmbH in writing are left at owner's risk.

Ex Approval

The sensors (except for AquaBar BS) are designed to be used in areas with explosive atmospheres (zone 0).



Important note

Necessarily observe point [17] of the according Ex certificate/EG type examination certificate.

Point [17] stipulates particular conditions for intrinsically safe operation.

Approval

AquaBar II, UniBar E II	NivuBar H III	NivuBar Plus II, NivuBar G II, HydroBar G II
<p>⊕ Ex II 1G Ex ia IIC T4 Ga</p> <p>⊕ Ex II 1D IIIC T85°C Da</p>	<p>⊕ Ex II 1G Ex ia IIB T4 Ga</p> <p>⊕ Ex II 1D Ex ia IIIC T85°C Da</p>	<p>⊕ Ex II 1G, II 1/2G or II 2G Ex ia IIC/IIB T6/T4 Ga Ga/Gb or Gb</p> <p>⊕ Ex II 1D Ex ia IIIC T85°C Da</p>
<p>Approval number: IBExU11ATEX 1046X</p>	<p>Approval number: IBExU11ATEX 1047X</p>	<p>Approval number: IBExU05ATEX 1193X</p>
<p>U_i = 28 V</p> <p>I_i = 93 mA</p> <p>P_i = 660 mW</p> <p>C_i = can be ignored</p> <p>L_i = can be ignored</p> <p>C GND = 27 nF</p>	<p>U_i = 28 V</p> <p>I_i = 93 mA</p> <p>P_i = 660 mW</p> <p>C_i = 13,2 nF</p> <p>L_i = 5 µH</p> <p>C GND = 27 nF</p>	<p>U_i = 28 V</p> <p>I_i = 93 mA</p> <p>P_i = 660 mW</p> <p>C_i = 27 nF</p> <p>L_i = 5 µH</p> <p>C GND = 27 nF</p>

DANGER



Risk of explosion due to zone entrainment

The cable duct between probe and transmitter shall be gas-tight.

To avoid zone entrainment always ensure gas-tight installation of probes featuring 1/2G approval in the zone partition wall.

Otherwise there is a risk of explosion.



Note

The Ex approvals are only valid in connection with the respective indication on the probes or the sensor name-plate.

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

3.4 Device identification

The instructions contained within this manual are valid only for the types of sensors specified on the title page.

The name plate is fixed on the side of the enclosure and contains the following:

- Name and address of the manufacturer
- CE label
- Information on type and series, serial no. if available
- Year of construction
- Ex-version probes are additionally labelled with the Ex protection ID as specified in chapter "3.2 Use in accordance with the requirements".







In case of enquiries and ordering replacement parts it is important to specify article number as well as the serial number of the respective sensor. This ensures correct and quick processing.









Note

Check the delivered instrument for accordance with your order by identifying the nameplate.

Check the nameplate for correct specification of the power supply.

 D-75031 Eppingen	HydroBar G II MB: 0...2 bar	 0044   2016	IBExU05ATEX1193 X II 1G Ex ia IIC T4 Ga II 1D Ex iaD 20 T85°C Ui: 28 VDC Ci: 27 nF Ii: 93 mA Li: 5 µH Pi: 660 mW Cgnd: 27 nF
 Art.-Nr.: HSB0HGB002EVU15	 Ser.-Nr.: 01234567		

 D-75031 Eppingen	NivuBar H III MB: 0...10 mWs	 0044   2016	IBExU11ATEX1047 X II 1G Ex ia IIB T4 Ga II 1D Ex ia IIC T85°C Da Ui: 28 VDC Ci: 13,2 nF Ii: 93 mA Li: 5 µH Pi: 660 mW Cgnd: 27 nF
 Art.-Nr.: HSB0NBH010E010K	 Ser.-Nr.: 01234567		

Overview and use in accordance with the requirements

























 D-75031 Eppingen	AquaBar II	  	IBExU11ATEX1046 X II 1G Ex ia IIC T4 Ga II 1D IIIC T85°C Da Ui: 28 VDC Ci: 0 nF li: 93 mA Li: 0 µH Pi: 660 mW Cgnd: 27 nF
	MB: 0...10 mWs		
 Art.-Nr.: HSB0ABW010E020K		 Ser.-Nr.: 01234567	
 D-75031 Eppingen	NivuBar G II	  	IBExU05ATEX1193 X II 1G Ex ia IIB T4 Ga II 1D Ex ia D 20 T85°C Ui: 28 VDC Ci: 27 nF li: 660 mW Li: 5 µH Pi: 660 mW
	MB: 0...1 mH2O		
 Art.-Nr.: HSB0NBP001E020G		 Ser.-Nr.: 01234567	
 D-75031 Eppingen	NivuBar Plus II	  	IBExU05ATEX1193 X II 1G Ex ia IIB T4 Ga II 1D Ex ia IIC T85°C Da Ui: 28 VDC Ci: 27 nF li: 93 mA Li: 5 µH Pi: 660 mW
	MB: 0 ... 6 m H2O		
 Art.-Nr.: HSB0NBP006E020K		 Ser.-Nr.: 01234567	
 D-75031 Eppingen	UniBar E II	  	IBExU11ATEX1046 X II 1G Ex ia IIC T4 Ga II 1D Ex ia IIC T85°C Da Ui: 28 VDC Ci: 0 nF li: 93 mA Li: 0 µH Pi: 660 mW Cgnd: 27 nF
	MB: 0...20 bar		
 Art.-Nr.: HSB0UEB020EVU05		 Ser.-Nr.: 01234567	

Abb. 3-1 Nameplates of the Pressure and Level Sensors

4 Technical Data

NivuBar Plus II NivuBar G II NivuBar H III	Submersible sensors
Power supply (U_B)	12...36 V DC intrinsically safe current circuit 14...28 Volt / 93 mA ($P_i = 660 \text{ mW}$)
Measurement range	See nameplate
Measurement signal (2-wire-technology)	4...20 mA
Load (max. 24 Volt)	600 Ohm / $R_{\max} = (U_B - 12) / 0.02 \text{ A}$
Connection cable	Polyurethane cable shielded 2x 0.14 mm ² ; d = 9 mm
Enclosure	Material: V4A Protection: IP68
Measurement membrane	Ceramics 96 % Al ₂ O ₂
Ex-Approval	See permissible EC-certificate/EG-type examination certificate in chapter "11 Certificates and Approvals"
Operation temperature	<u>Ex:</u> Zone 0 = -10...+60 °C at P_{atm} 0.8...1.1 bar Zone 1 (and higher) = -10...+70 °C <u>None-Ex:</u> -25...+125 °C
Storage temperature	-25...+125 °C
Max. humidity	80 %, non condensing
	Store the probes in a safe place protected from corrosive or organic solvent vapours, radioactive radiation and strong electromagnetic fields.

AquaBar II AquaBar BS (none-Ex)	Submersible sensors
Power supply (U_B)	12...36 V DC intrinsically safe current circuit 14...28 Volt / 93 mA ($P_i = 660$ mW)
Measurement range	See nameplate
Measurement signal (2-wire-technology)	4...20 mA
Load (max. 24 Volt)	600 Ohm / $R_{max} = (U_B - 12) / 0.02$ A
Connection cable	Polyurethane cable shielded 2x 0.14 mm ² ; d = 9 mm
Enclosure	Material: V4A Protection: IP68
Measurement membrane	Stainless steel
Ex-Approval	See permissible EC-certificate/EG-type examination certificate in chapter "11 Certificates and Approvals"
Operating temperature	<u>AquaBar II:</u> Zone 0 = -20...+60 °C at P_{atm} 0.8...1.1 bar Zone 1 (and higher) = -20...+70 °C <u>AquaBar BS (none-Ex):</u> -10...+70 °C
Storage temperature	-25...+70 °C
Max. humidity	80 %, non-condensing
	Store the probes in a safe place protected from corrosive or organic solvent vapours, radioactive radiation and strong electromagnetic fields.

HydroBar G II UniBar E II	Pressure sensors
Power supply (U_B)	12...36 V DC intrinsically safe current circuit 14...28 Volt / 93 mA ($P_i = 660 \text{ mW}$)
Measurement range	See nameplate
Measurement signal (2-wire-technology)	4...20 mA
Load (max. 24 Volt)	600 Ohm / $R_{\max} = (U_B - 12) / 0.02 \text{ A}$
Enclosure	Material: V4A Protection: IP67 (field enclosure), IP65 (enclosure with plug connection DIN 43650); cable gland: PG13.5 (field enclosure), PG9 (with plug connection DIN 43650)
Measurement membrane	Ceramics 96 % Al_2O_3 (HydroBar G II); Stainless steel V4A (UniBar E II)
Ex-Approval	See permissible EC-certificate/EG-type examination certificate in chapter "11 Certificates and Approvals"
Operation temperature	<u>HydroBar GII (Ex):</u> Zone 0 = -20...+60 °C at P_{atm} 0.8...1.1 bar Zone 1 (and higher) = -25...+70 °C <u>HydroBar GII (None-Ex):</u> -40...+85 °C <u>UniBar EII (Ex):</u> Zone 0 = -20...+60 °C at P_{atm} 0.8...1.1 bar Zone 1 (and higher) = -20...+70 °C <u>UniBar EII (None-Ex):</u> -40...+85 °C
Storage temperature	-40...+100 °C
Max. humidity	80 %, non condensing
	Store the probes in a safe place protected from corrosive or organic solvent vapours, radioactive radiation and strong electromagnetic fields.

5 Delivery and Transport

5.1 Reception inspection

Check the packaging for visible damage immediately after receipt. Any possible damage in transit shall be instantly reported to the carrier. Furthermore a written report shall be sent to NIVUS GmbH in Eppingen. Incomplete deliveries shall be reported in writing either to your local representative or directly to the NIVUS head office in Eppingen within two weeks.



Note

Mistakes cannot be rectified later.

5.2 Delivery

The standard delivery of the Pressure and Level Sensors contains:

- Pressure or Level Sensor corresponding to the shipping documents
- Instruction manual including the certificate of conformity and approvals; it contains any relevant information on how to operate the Pressure and Level Sensors

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

5.3 Transport

Sensor and Transmitter 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

In case of a required reshipment return the unit at customer cost to NIVUS GmbH in Eppingen using the original packaging.

Insufficiently franked shipments will not be accepted.

5.5 Installation of spare parts and parts subject to wear and tear

We herewith particularly emphasise that replacement parts or accessories not supplied by NIVUS moreover are not certified and approved by NIVUS too. Installation and/or the use of such products hence may negatively influence predetermined constructional characteristics of the measurement system or even lead to instrument failures.

NIVUS cannot be held responsible for any damage resulting due to the use of non-original parts and non-original accessories.

6 Construction and Function

6.1 Construction

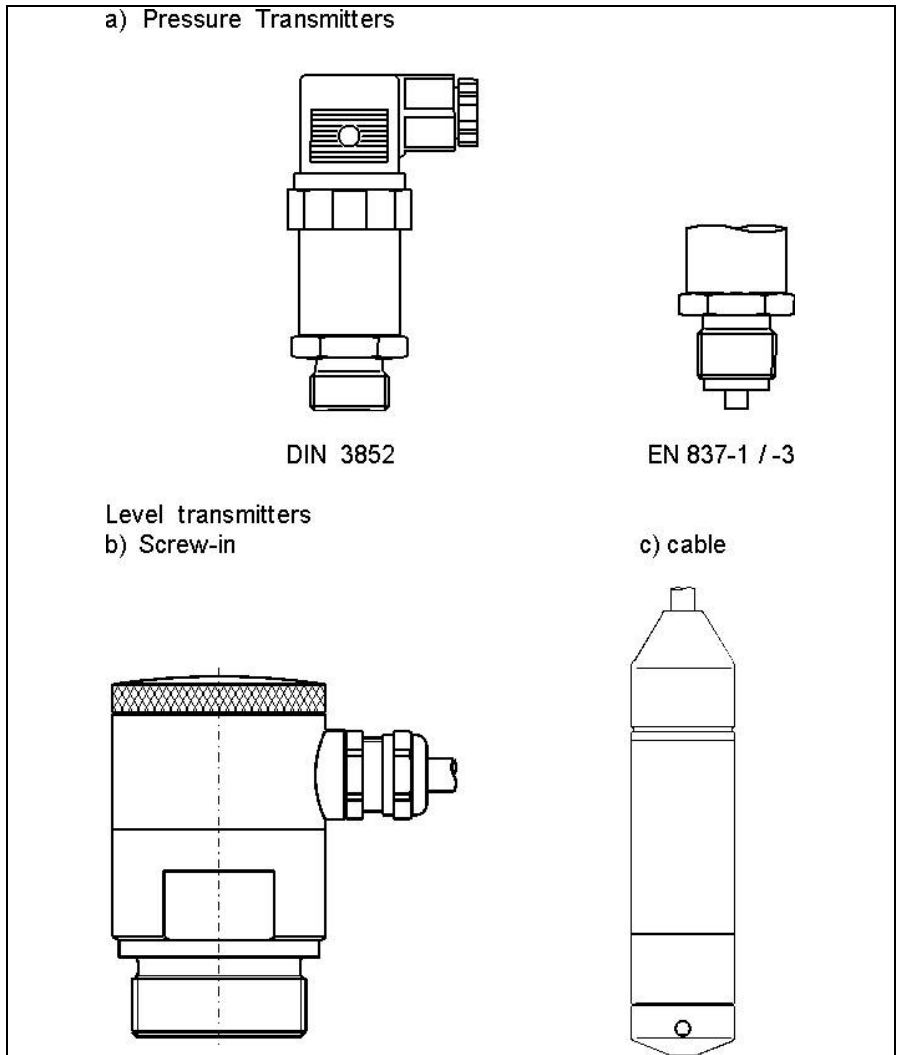


Fig. 6-1 Pressure Transmitters

6.2 Functional principle

6.2.1 General

The 2-wire pressure measurement unit is for detecting static and dynamic pressures in gasiform and liquid media. Relative pressures (negative and positive pressure) as well as absolute pressures can be measured. The pressure will be converted into a standardised electric signal.

6.2.2 Sensor versions

The pressure- and level sensors are available in different variations. The tables below provide an overview on the various options.

HSB0	Type			
	NBP	Submersible sensor with ceramic diaphragm for level measurement		
		Measurement Range		
		001	1 m (3 ft) water column	
		002	2 m (6 ft) water column	
		004	4 m (13 ft) water column	
		006	6 m (20 ft) water column	
		010	10 m (33 ft) water column (cable length 20 m recommended)	
		xxx	Special measurement range [max. 100 m WC]	
		ATEX Approval		
		E	Zone 0	
		Cable Length		
		010	10 m (33 ft) (recommended only in measurement ranges <10 m WC)	
		020	20 m (66 ft)	
		030	30 m (100 ft)	
		050	50 m (165 ft)	
		099	100 m (330 ft)	
		xxx	Special cable length request	
		Construction		
			K	Standard
HSB0	NBP		E	K

Fig. 6-2 Type key NivuBar Plus II

HSB0	Type				
	NBH	Submersible sensor with ceramic membrane for level measurement and HART Communication			
		Measurement Range			
		010	10 m (33 ft) WC adjustable, min. 20 % FS		
		020	20 m (66 ft) WC adjustable, min. 20 % FS		
		xxx	Special measurement range [max. 100 m WC]		
		ATEX Approval			
		0	None		
		E	Zone 0		
		Cable Length			
010		10 m (33 ft) (recommended only in measurement range <10 m WC)			
020	20 m (66 ft)				
030	30 m (100 ft)				
050	50 m (165 ft)				
099	100 m (330 ft)				
xxx	Special cable length request				
Construction					
	K	Standard			
HSB0	NBH				K

Fig. 6-3 Type key NivuBar H III

HSB0	Type				
	NBP	Submersible sensor with ceramic membrane for level measurement			
		Measurement Range			
		001	1 m (3 ft) WC		
		002	2 m (6 ft) WC		
		004	4 m (13 ft) WC		
		xxx	Special measurement range [max. 100 m WC]		
		ATEX Approval			
		E	Zone 0		
		Cable Length			
		005	5 m (16 ft)		
		010	10 m (33 ft)		
		020	20 m (66 ft)		
		030	30 m (100 ft)		
		050	50 m (165 ft)		
		099	100 m (330 ft)		
		xxx	Special cable length on request		
		Construction			
		G	1" thread on end of probe		
HSB0	NBP		E		G

Fig. 6-4 Type key NivuBar G II

HSB0	Type	AB Submersible probe with stainless steel diaphragm for level measurement				
		Measurement Unit				
		W	Water column			
			Measurement Range			
			002	2 m (6 ft) WC		
			004	4 m (13 ft) WC		
			006	6 m (20 ft) WC		
			010	10 m (33 ft) WC (cable length 20 m recommended)		
			xxx	Special measurement range [max. 100 m WC]		
				ATEX Approval		
			0	none		
				Cable Length		
				010	10 m (33 ft)	
				020	20 m (66 ft)	
				030	30 m (100 ft)	
				050	50 m (165 ft)	
				099	100 m (330 ft)	
				xxx	Special cable length on request	
				Construction		
				K	Standard	
HSB0	AB	W		0		K

Fig. 6-5 Type key AquaBar II

HSB0	Type					
	BS	Submersible probe with piezoresistive measurement cell				
		Measurement Unit				
		W	Water column			
			Measurement Range			
			004	4 m (13 ft) WC		
			006	6 m (20 ft) WC		
			010	10 m (33 ft) WC (cable length 20 m recommended)		
			020	20 m (66 ft) WC (cable length 30 m recommended)		
			xxx	Special measurement range [max. 160 m WC]		
			ATEX Approval			
			0	none		
				Cable Length		
				010	10 m (33 ft)	
				020	20 m (66 ft)	
				030	30 m (100 ft)	
				050	50 m (165 ft)	
				099	100 m (330 ft)	
				xxx	Special cable length on request	
					Construction	
					K	Standard
HSB0	BS	W		0		K

Fig. 6-6 Type key AquaBar BS

HSB0	Type	UE Pressure transmitter with stainless steel diaphragm					
		Measurement Unit					
		B	Bar				
		W	Water column				
		Measurement Range					
		001	1 bar / 1 m (3 ft) WC				
		002	2 bar / 2 m (6 ft) WC				
		004	4 bar / 4 m (13 ft) WC				
		006	6 bar / 6 m (20 ft) WC				
		010	10 bar / 10 m (33 ft) WC				
		020	20 bar / 20 m (66 ft) WC				
		xxx	Special measurement range				
		ATEX Approval					
		0	None				
	E	Zone 0					
	Gasket						
	V	Viton					
	Enclosure / Connection						
	U	Stainless steel non-rotatable					
	K	Plug connector according to DIN ISO 4400					
	E	Ex Display (LCD, integrated)					
	Mechanic Connection / Process Connection						
	05	G ¹ / ₂ " thread DIN 3852 open connection with 12 mm drilling					
HSB0	UE				V	05	

Fig. 6-7 Type key UniBar E II

HSB0	Type						
	HG	Pressure transmitter with ceramic diaphragm					
		Measurement Unit					
		B	Bar				
		W	Water column				
		Measurement Range					
		001	1 bar / 1 m (3 ft) water column				
		002	2 bar / 2 m (6 ft) water column				
		004	4 bar / 4 m (13 ft) water column				
		006	6 bar / 6 m (20 ft) water column				
		010	10 bar / 10 m (33 ft) water column				
		020	20 bar / 20 m (66 ft) water column				
		xxx	Special measurement range				
		ATEX Approval					
		0	None				
		E	Zone 0				
		Gasket					
		V	Viton				
		Enclosure					
		U	Stainless steel non-rotatable				
		E	Stainless steel with rotatable display (only with Ex approval)				
		Mechanic Connection / Process Connection					
		05	G ¹ / ₂ " thread DIN ISO 228				
		SO	Special construction				
HSB0	HG				V		

Fig. 6-8 Type key HydroBar G II

7 Installation and Connection

7.1 General Installation Instructions

Check correct and complete installation of pressure and level sensors prior to initial start-up. Installation should be carried out by trained expert personnel only.

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

CAUTION



Warnings in property damages

- *Observe proper installation.*
- *Follow applicable statutory and operational guidelines.*

Improper handling may lead to personal injury and or damage your instruments.

7.2 Installation

7.2.1 General

The sensors mounting place has to be selected according to certain criteria.

Please strictly **avoid**:

- direct sunlight
- heat emitting objects (max. ambient temperature: +40 °C (104 °F))
- objects with strong electromagnetic fields (e. g. frequency converters)
- corrosive chemicals or gases
- mechanical shocks
- vibrations
- radioactive radiation
- installation close to footpaths or travel ways

For fastening the pressure sensor use the external thread attached to the case ($\frac{1}{2}$ " or $1\frac{1}{2}$ "). For submersible sensor use the straining clamp (optional).



Note

Use appropriate tools for sensor mounting and use no force. Fix cable glands with caution.

Remove the protective cap from submersible sensors (Fig. 9-1), as this cap primarily serves as transport protection.

The enclosure protection rating for pressure probes with screw-in thread ($\frac{1}{2}$ " or $1\frac{1}{2}$ ") is IP65 / IP67 and IP68 for submersible sensors.

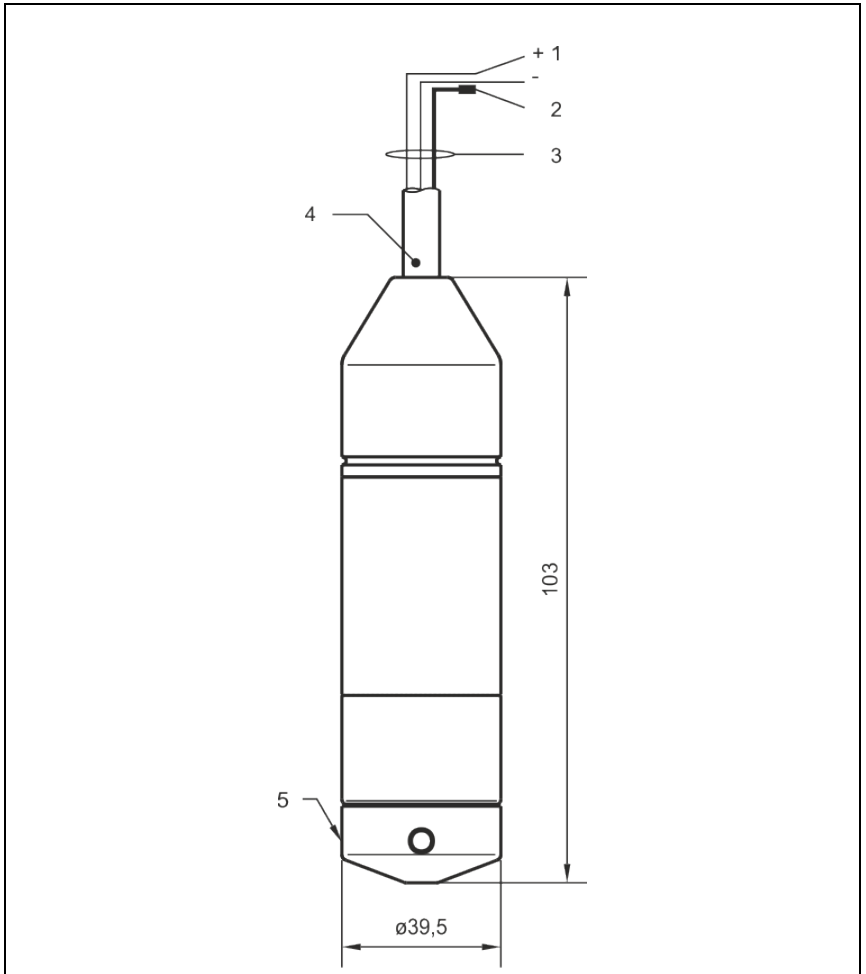


Keep it tight

Do not open the enclosure of submersible sensors, as this will cause the protection class to become invalid (leak tightness).

Ensure the enclosure lid to be always screwed tightly in order to observe the indicated protection.

7.2.2 Dimensions



- 1 Cable color see chapter "7.2.4 Pin configuration"
- 2 PVC tube with PE-filter for atmospheric pressure reference
- 3 Shield PE/earth
- 4 PUR-cable \varnothing 9 mm (standard)
- 5 Protecting cap

Fig. 7-1 **Sensor – NivuBar Plus II**

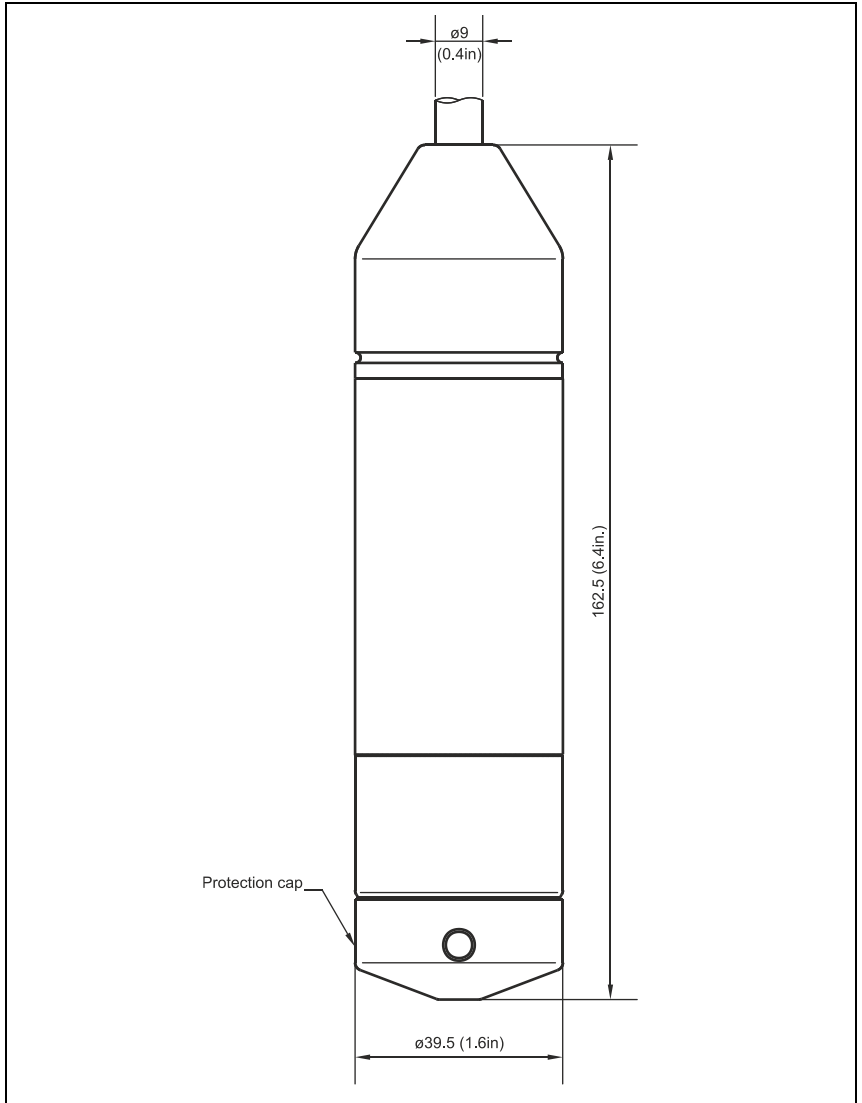
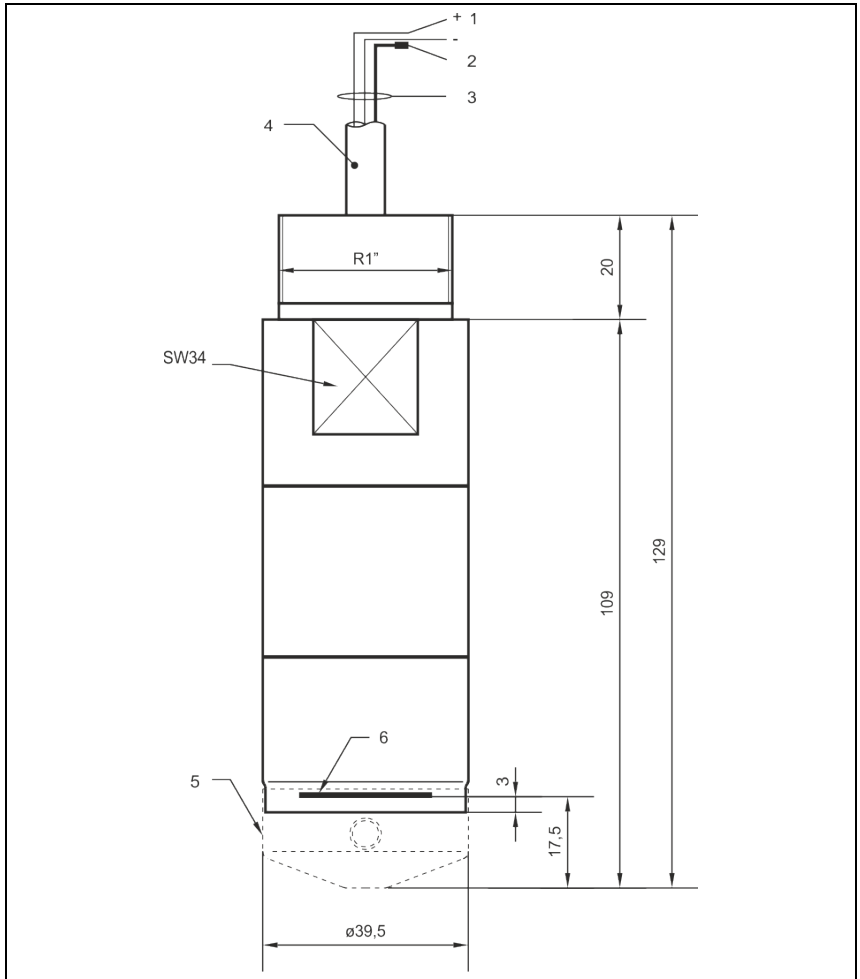


Fig. 7-2 **Sensor – NivuBar H III**



- 1 Cable color see chapter "7.2.4 Pin configuration"
- 2 PVC-tube with PE-filter for atmospheric pressure reference
- 3 Shield/earth green/yellow
- 4 PUR-cable $\varnothing 9$ mm (standard)
- 5 Protection cap
- 6 Diaphragm

Fig. 7-3 **Sensor – NivuBar G II**

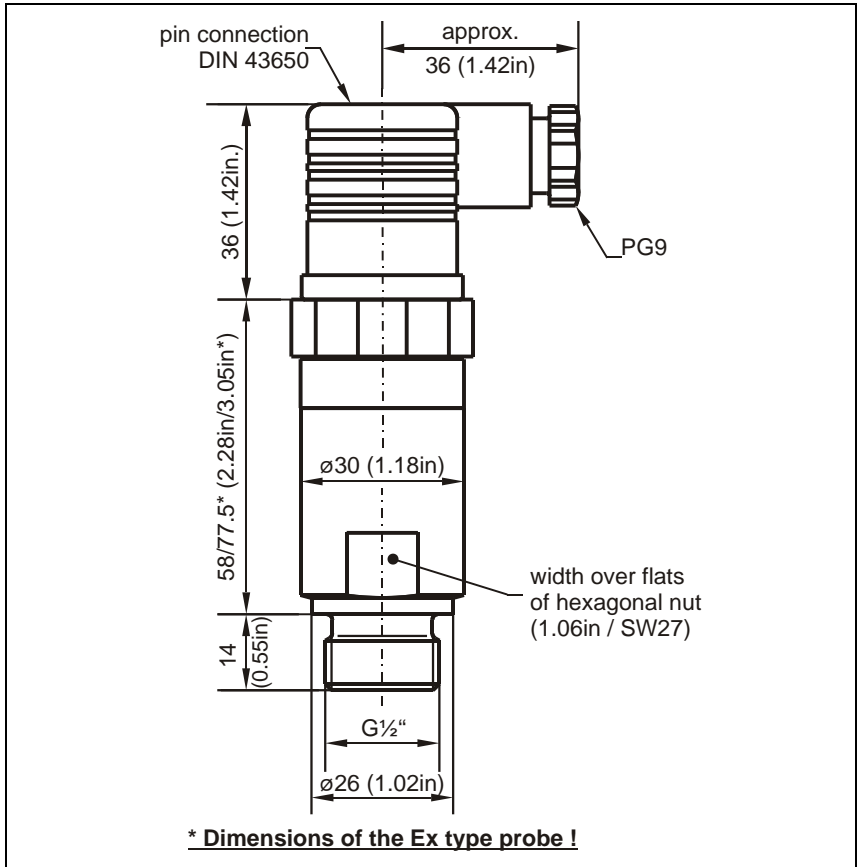


Fig. 7-4 Sensor – UniBar E II with plug

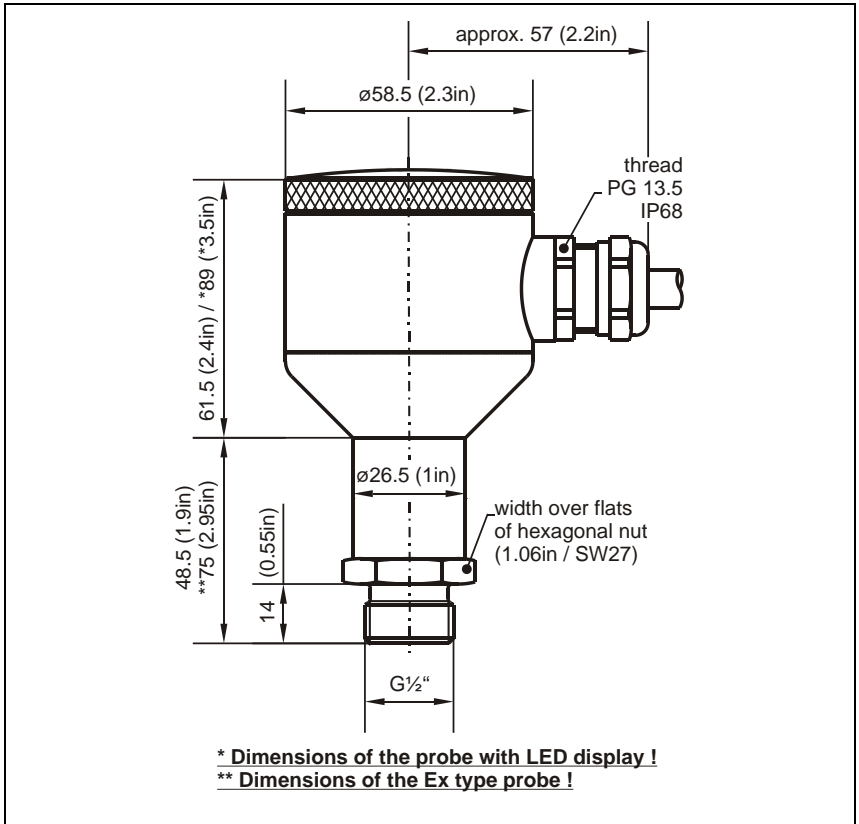


Fig. 7-5 UniBar E II with Display (in stainless steel enclosure)

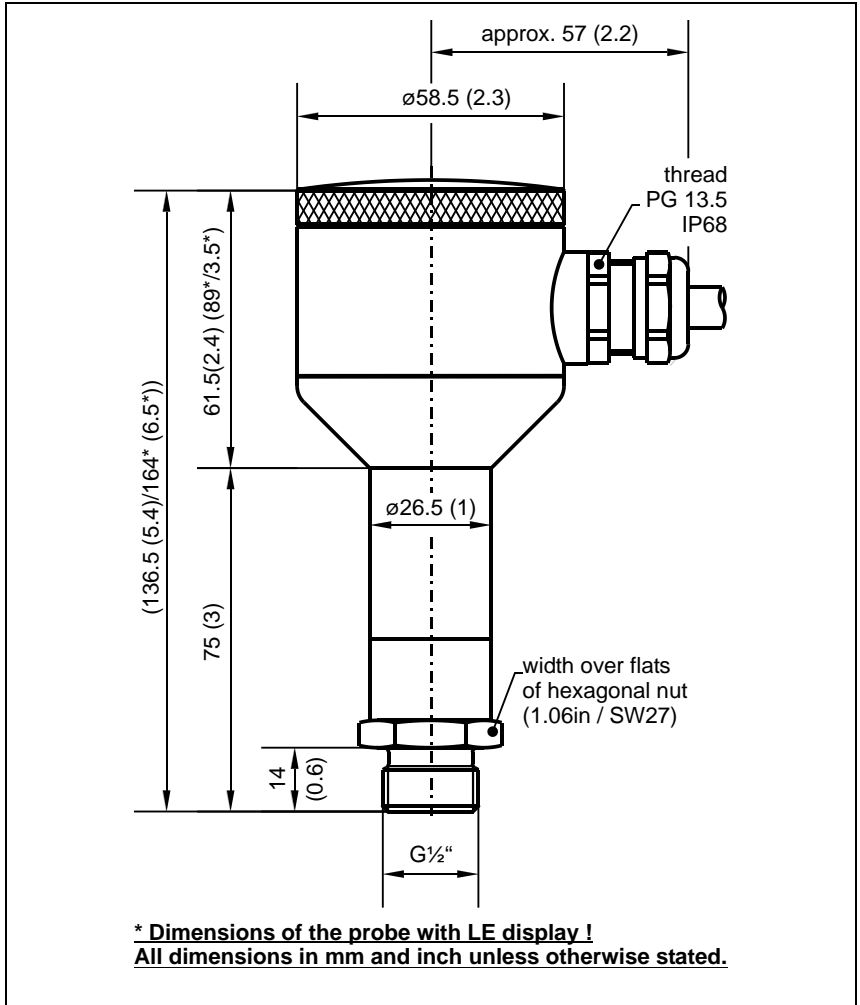


Fig. 7-6 UniBar E II Ex with Display (in stainless steel enclosure)

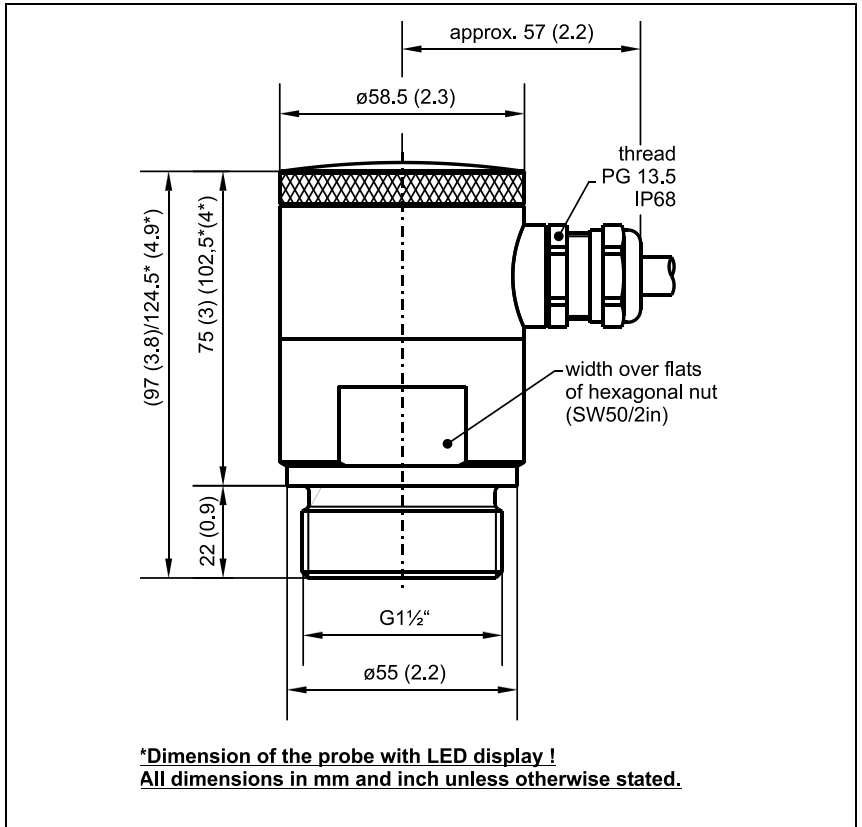


Fig. 7-7 Sensor – HydroBar G II

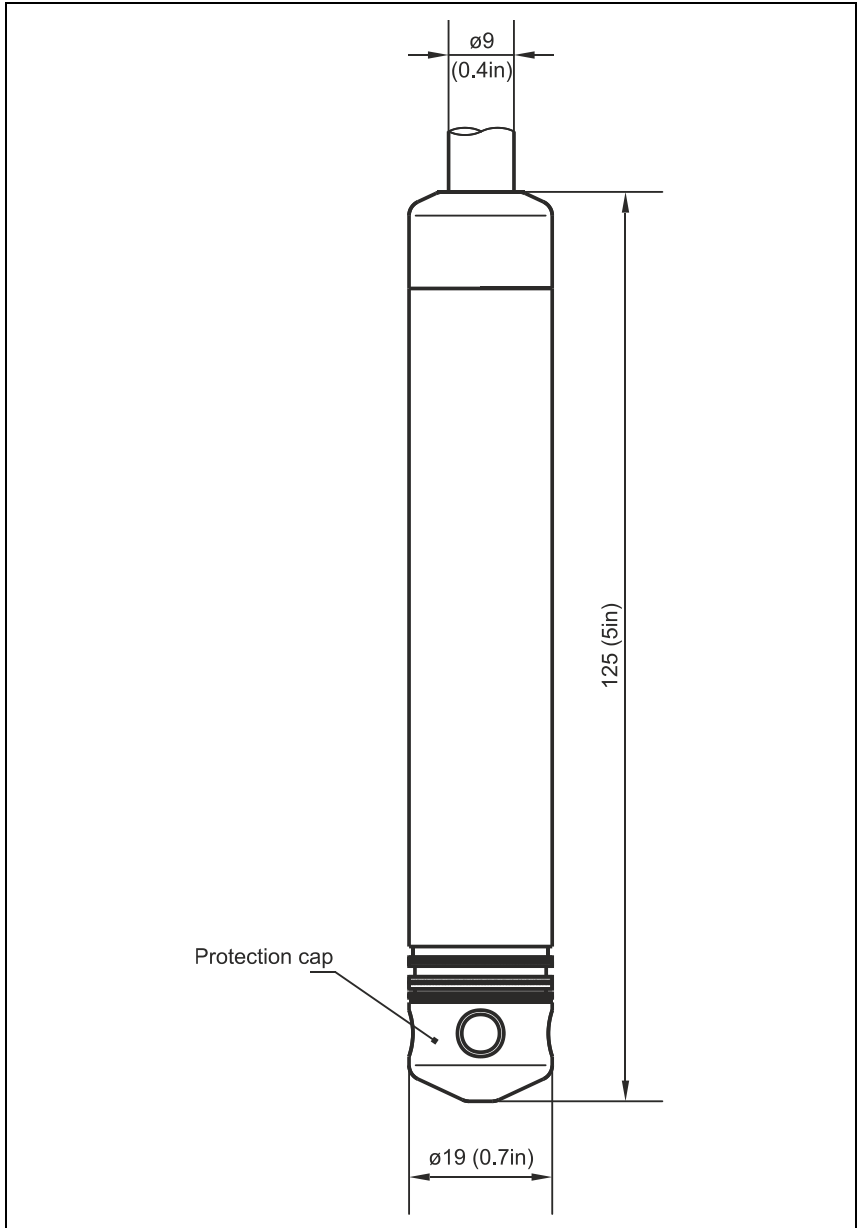


Fig. 7-8 **Sensor – AquaBar BS**

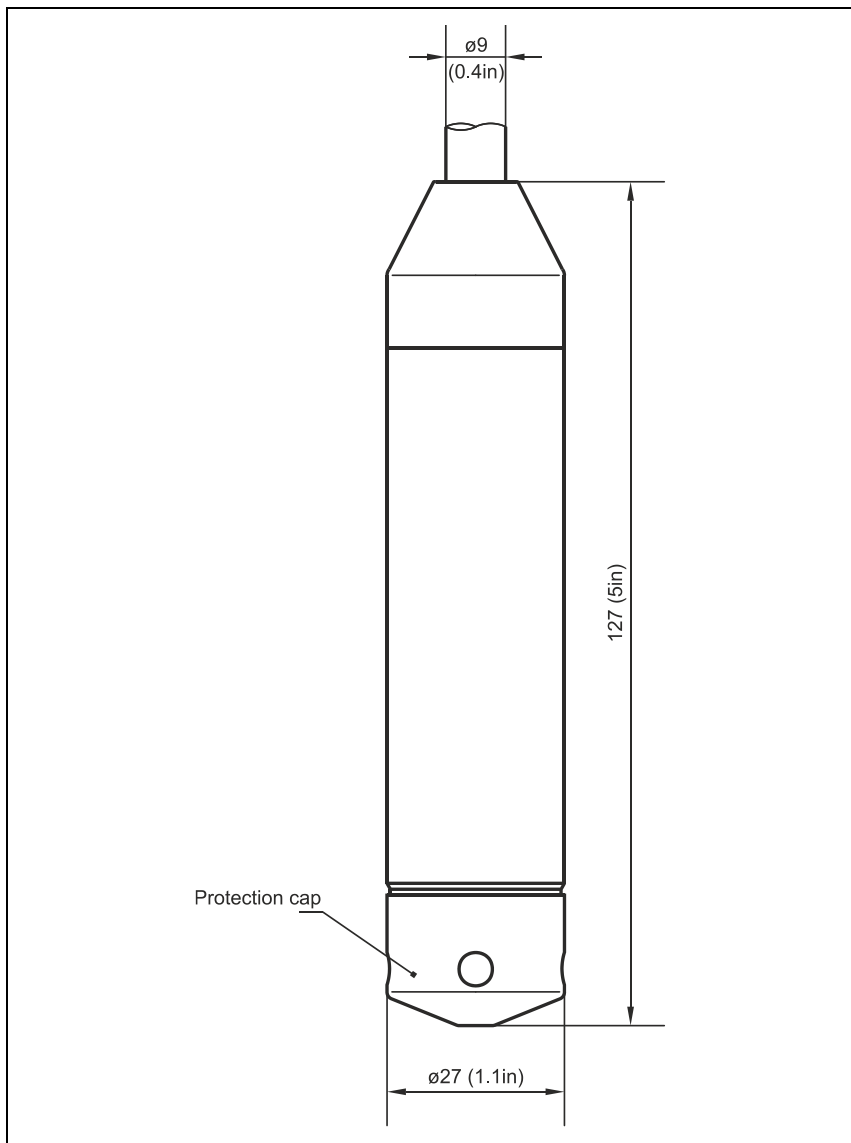


Fig. 7-9 **Sensor – AquaBar II**

7.2.3 Connection



Ground sensor

*If used in Ex areas the sensor enclosure must be grounded always!
To achieve this use the cable shield (submersible sensors) or the ground clamp within the enclosure (pressure sensors).*

When using the probes in connection with NIVUS Ex-GPRS data loggers Types NivuLog Easy and NivuLog 2 Ex (N) connect the shield to the GND/Earth clamp.

Observe the accompanying instruction manual.



Observe maximum values!

Electric connection is permitted to be carried out only on a certified intrinsically safe power circuit with maximum values as specified in the EC Type Examination Certificate.



Equip cable with strain relief

The cable must be equipped with a straining clamp as strain relief as soon as the sensor is installed hanging from the cable.

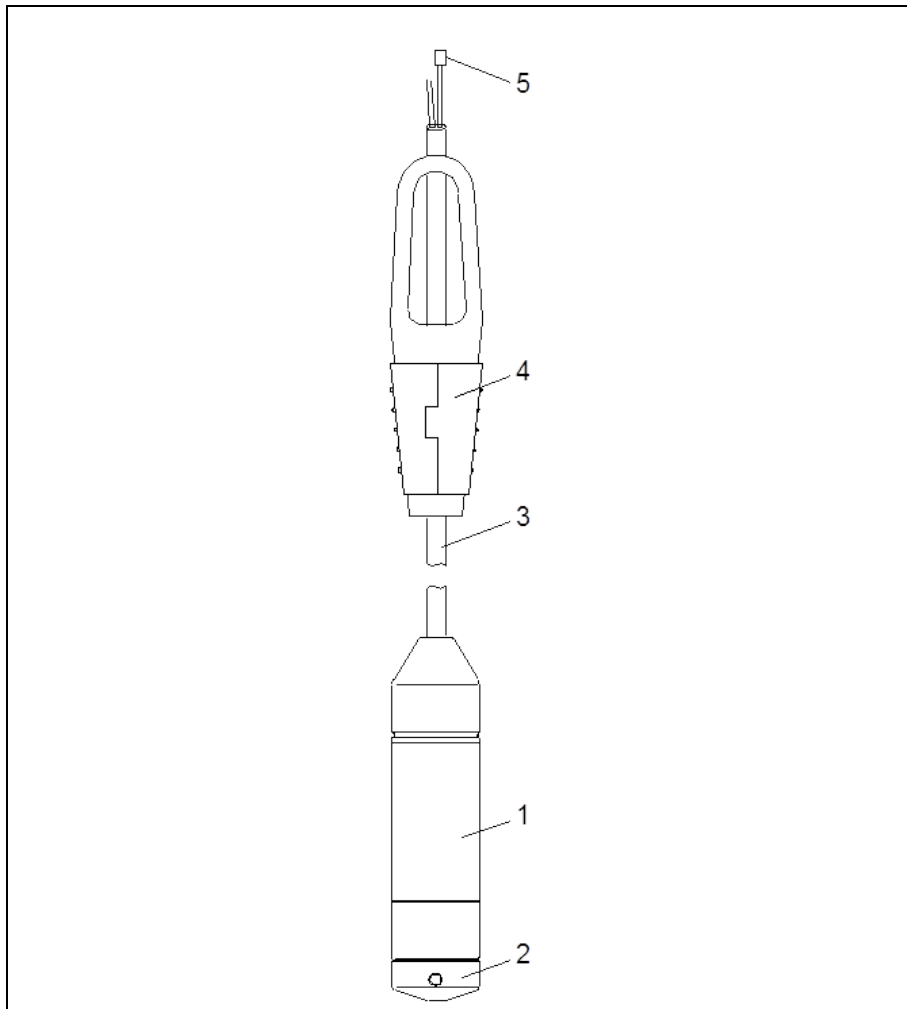
Connect submersible sensors by using the sensor cable and pressure probes by using the integrated terminal clamps.

Connection conditions

- The cable should end in a dry area e. g. switch board.
- Using a connector box, you have to use pressure compensation.
- Cutting the sensor cable is possible.



Do not remove the filter on the end of the air tube.



- 1 Sensor body
- 2 Protective cap (transportation lock, remove for operation)
- 3 Cable
- 4 Straining clamp
- 5 Pressure compensation hose + filter element

Fig. 7-10 Overview cable sensors

7.2.4 Pin configuration

Connector pin out	Electrical connections				
	DIN 43650	Binder 723 (5-pin)	Bulgin Buccaneer	Label	Cable colours
Supply +	1	3	7	(In+) + UB/US+	red (white)*
Supply -	2	4	2	(In-) – UB/US-	blue (brown)*
Ground / PE	Ground pin	5	4	GND / PE	shield (green / yellow)*
Output +	no function	no function	no function	Out+ / S+	

* cable colour depends on the cable material used (PTFE/PUR)

7.2.5 Circuit

Sensor wiring is carried out in 2-wire technology.

At 24 V DC supply voltage a current flow/measurement signal between 4...20 mA will be generated.

In case of exceeding the measurement range the measurement current may increase beyond 20 mA. The maximum value depends on supply voltage and load resistance used.

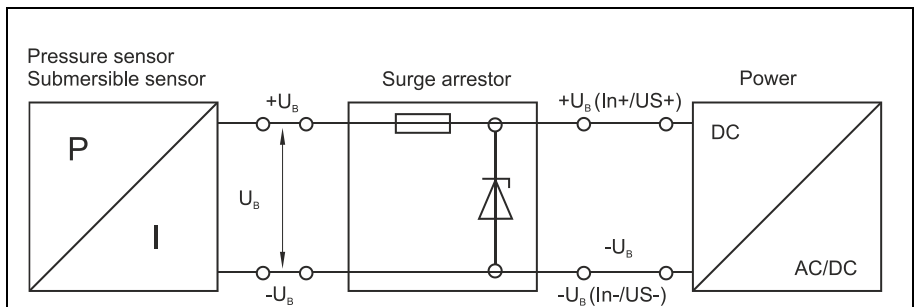


Fig. 7-1 Example – Connection for Ex-sensors

7.2.6 Power supply

The supply voltage may vary between 12...36 V DC (14...28 V DC in Ex areas). Note however that the possible load resistance depends on the supply voltage.

18 Volt - max. 300 Ohm

24 Volt - max. 600 Ohm



Power and signal circuit

In type of protection "Intrinsic Safety Ex ia IIC/IIB" or connection to certified intrinsically safe current circuit only. When using intrinsically safe units as Zone-0/20 equipment power supply must be carried out by using a free-of-ground and galvanically isolated power supply (e. g. NivuCont Plus).

Specifications for pressure and level sensors without connection cable/extension:

U _i = 28 V	The values specified here are intrinsic values, without specifications of line capacity and inductance.
I _i = 93 mA	
P _i = 660 mW	The values are in case of submersible sensors: Line inductance = 1 μH/m Capacity = 100 pF/m
C _i = 27 nF	
L _i = 5 μH	

8 Initial Start-up

Notes to the user

Before you connect and operate a pressure or level sensor you should strictly follow the notes below!

This instruction manual contains all necessary information to operate the sensors.

It is addressed to qualified technical personnel who have appropriate knowledge about measurement technology and waste water hydraulics.

Read this instruction manual carefully to ensure proper sensor function!

The delivered pressure level sensor must be wired according to the wiring diagram as de-scribed in chapter "7.2.4 Pin configuration".

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



The measurement signal may vary within a range from approx. 3.6 to 22 mA (maximum value depends on supply voltage).

Measurement range: see type label

Measurement signal: 4...20 mA

9 Maintenance and Cleaning

WARNING



Germ contamination

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

9.1 Interval

The sensors are conceived to be virtually free of maintenance and wear. NIVUS recommends having them inspected by the NIVUS customer service once per year. Depending on the area of use the maintenance intervals however may vary.

Check the entire system and the cables for damage.

9.2 Cleaning

Clean the sensor enclosure if necessary with a damp, lint-free cloth.

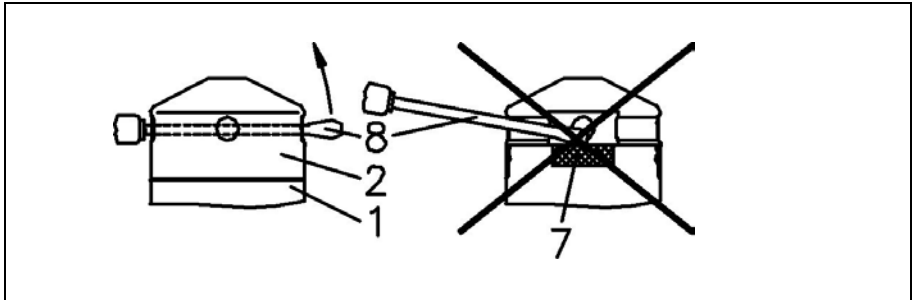


Static charging

When cleaning with a dry cloth there is the danger of the static charging.

For heavy pollution NIVUS recommends the use of commercial detergents or surface-active agents. Using abrasive cleansing agents is not allowed.

To clean the diaphragm, remove the protective cap as follows:



- 1 Sensor unit
- 2 Protective cap
- 7 Measurement cell
- 8 Tool to open (screw driver or similar)

Fig. 9-1 Removing the protective cap

By hand:

- Hold the probe unit (1), then
- tip the protective cap (2) and pull it off.

With a screw driver or similar tool:

- Put the tool (8) straight through two holes of the protective cap without using force to the pressure sensor (7) to avoid damages.

9.3 Dismantling/Disposal

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

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EU Konformitätserklärung

EU Declaration of Conformity

Déclaration de conformité UE

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E-Mail: info@nivus.com
Internet: www.nivus.de

Für das folgend bezeichnete Erzeugnis:

For the following product:

Le produit désigné ci-dessous:

Bezeichnung:	AquaBar II, AquaBar BS, HydroBar G II,
<i>Description:</i>	NivuBar H II, NivuBar G II,
<i>Désignation:</i>	NivuBar Plus II, UniBar E
Typ / Type:	HSB0....

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

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:*

Marcus Fischer (Geschäftsführer / *Managing Director / Directeur général*)

Eppingen, den 20.04.2016

Gez. *Marcus Fischer*

EU Konformitätserklärung

EU Declaration of Conformity

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E-Mail: info@nivus.com
Internet: www.nivus.de

Für das folgend bezeichnete Erzeugnis:

For the following product:

Le produit désigné ci-dessous:

Bezeichnung:	"Ex" UniBar E
<i>Description:</i>	<i>"Ex" UniBar E</i>
<i>Désignation:</i>	<i>"Ex" UniBar E</i>
Typ / Type:	HSB0UExxxE...

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

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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:

- 2014/34/EU
- 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:

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- EN 61326-1:2013
- EN 60079-11:2012
- EN 60079-26:2015
- EN 60079-0:2012+A11:2013

Ex-Kennzeichnung / *Ex-designation* / *Marquage Ex* :

⊕ II 1G Ex ia IIC T4 Ga

⊕ II 1D Ex iaD 20T 85 °C

EU-Baumusterprüfbescheinigung / *EU-Type Examination Certificate* / *Attestation d'examen «UE» de type:*

IBExU11ATEX1046X

Notifizierte Stelle (Kennnummer) / *Notified Body (Identif. No.)* / *Organisme notifié (N° d'identification)*

IBExU Institut für Sicherheitstechnik GmbH, 09599 Freiberg, Allemagne (0637)

Qualitätssicherung ATEX / *Quality assurance ATEX* / *Assurance qualité ATEX:*

TÜV Nord CERT GmbH, Am TÜV 1, 30519 Hannover, Allemagne (0044)

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:*

Marcus Fischer (Geschäftsführer / *Managing Director* / *Directeur général*)

Eppingen, den 18.12.2019

Gez. *Marcus Fischer*

EU Konformitätserklärung

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E-Mail: info@nivus.com
Internet: www.nivus.de

Für das folgend bezeichnete Erzeugnis:

For the following product:

Le produit désigné ci-dessous:

Bezeichnung:	"Ex" NivuBar H III Ex
<i>Description:</i>	<i>"Ex" NivuBar H III Ex</i>
<i>Désignation:</i>	<i>"Ex" NivuBar H III Ex</i>
Typ / Type:	HSB0NBHxxxE...

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:

- 2014/34/EU
- 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
- EN 60079-11:2012
- EN 60079-26:2015
- EN 60079-0:2012+A11:2013

Ex-Kennzeichnung / *Ex-designation* / *Marquage Ex* :

⊕ II 1G Ex ia IIB T4 Ga

⊕ II 1D Ex iaD 20T 85 °C

EU-Baumusterprüfbescheinigung / *EU-Type Examination Certificate* / *Attestation d'examen «UE» de type:*

IBExU11ATEX1047X

Notifizierte Stelle (Kennnummer) / *Notified Body (Identif. No.)* / *Organisme notifié (N° d'identification)*

IBExU Institut für Sicherheitstechnik GmbH, 09599 Freiberg, Allemagne

(0637)

Qualitätssicherung ATEX / *Quality assurance ATEX* / *Assurance qualité ATEX:*

TÜV Nord CERT GmbH, Am TÜV 1, 30519 Hannover, Allemagne

(0044)

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NIVUS GmbH
Im Täle 2
75031 Eppingen
Allemagne

abgegeben durch / *represented by* / *faite par:*

Marcus Fischer (Geschäftsführer / *Managing Director* / *Directeur général*)

Eppingen, den 18.12.2019

Gez. *Marcus Fischer*

EU Konformitätserklärung

EU Declaration of Conformity

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E-Mail: info@nivus.com
Internet: www.nivus.de

Für das folgend bezeichnete Erzeugnis:

For the following product:

Le produit désigné ci-dessous:

Bezeichnung:	"Ex" HydroBar G II Ex / NivuBar G II Ex / NivuBar Plus II Ex
<i>Description:</i>	<i>"Ex" HydroBar G II Ex / NivuBar G II Ex / NivuBar Plus II Ex</i>
<i>Désignation:</i>	<i>"Ex" HydroBar G II Ex / NivuBar G II Ex / NivuBar Plus II Ex</i>
Typ / Type:	HSB0HGxxxxE...¹⁾ / HSB0NBPxxxExxxG¹⁾ / HSB0NBPxxxExxxK²⁾

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:

- 2014/35/EU
- 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:

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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
- EN 60079-11:2012
- EN 60079-26:2015
- EN 60079-0:2012+A11:2013

Ex-Kennzeichnung / *Ex-designation* / *Marquage Ex* :

⊕ II 1G Ex ia IIC T4 Ga¹⁾

⊕ II 1G Ex ia IIB T4 Ga²⁾

⊕ II 1D Ex iaD 20T 85 °C

-25 °C ≤ Ta ≤ +70 °C

EU-Baumusterprüfbescheinigung / *EU-Type Examination Certificate* / *Attestation d'examen «UE» de type:*

IBExU05ATEX1193X (inkl. 1. Ergänzung)

Notifizierte Stelle (Kennnummer) / *Notified Body (Identif. No.) / Organisme notifié (Nº d'identification)*

IBExU Institut für Sicherheitstechnik GmbH, 09599 Freiberg, Allemagne

(0637)

Qualitätssicherung ATEX / *Quality assurance ATEX / Assurance qualité ATEX:*

TÜV Nord CERT GmbH, Am TÜV 1, 30519 Hannover, Allemagne

(0044)

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:*

Marcus Fischer (Geschäftsführer / *Managing Director / Directeur général*)

Eppingen, den 18.12.2019

Gez. *Marcus Fischer*

[1] **EC-TYPE EXAMINATION CERTIFICATE**

according to Directive 94/9/EC, Annex III



(Translation)

[2] Equipment and Protective Systems intended for use in Potentially Explosive Atmospheres, Directive 94/9/EC

[3] EC-Type Examination Certificate Number: **IBExU11ATEX1046 X**

[4] Equipment: **Pressure transmitter**
type AquaBar II und UniBar E II

[5] Manufacturer: NIVUS GmbH

[6] Address: Im Täle 2
75031 Eppingen
GERMANY

[7] The design of the equipment mentioned under [4] and any acceptable variation thereto are specified in the schedule to this EC-Type Examination Certificate.

[8] IBExU Institut für Sicherheitstechnik GmbH, NOTIFIED BODY number 0637 in accordance with article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that the under [4] mentioned 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 test results are recorded in the test report IB-11-3-012/1 of 24 March 2011.

[9] Compliance with the Essential Health and Safety Requirements has been assured by compliance with EN 60079-0:2009, EN 60079-11:2007, EN 60079-26:2007 and EN 61241-11:2006.

[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 under [17] in the schedule to this EC-Type Examination 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 mentioned in [4] shall include at least one of the following:

II 1G Ex ia IIC/IIB T4 Ga

II 1D Ex iaD 20 T85 °C

IBExU Institut für Sicherheitstechnik GmbH
Fuchsmühlenweg 7 - 09599 Freiberg, Germany
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Authorised for certifications Explosion protection

By order

(Dr. Wagner)

Schedule



- Seal-
(ID no. 0637)

Freiberg, 24 March 2011

Certificates without signature and seal are not valid.
Certificates may only be duplicated completely and unchanged. In case of dispute, the German text shall prevail.

[13] **Schedule**

[14] **to the EC-TYPE EXAMINATION CERTIFICATE IBExU11ATEX1046 X**

[15] **Description of equipment**

The Pressure transmitters AquaBar II und UniBar E II are different pressure measurement devices or level probe in stainless steel enclosure with different pressure ports. As measuring cell and evaluation electronic serves a separately approved electronic modules. The devices are intended for use in potentially hazardous areas, where Category 1G devices are required. They are supplied by an intrinsically safe power supply of the Category „ia“.

Types:

Equipment	Connection	Design	Enclosure
AquaBar II	cable	immersion probe	stainless steel
UniBar E II	plug	screw-in probe	stainless steel

Technical Data

supply electric circuit in type of protection Intrinsic Safety Ex ia IIC
(supply + and -)

U_i 28 V DC

I_i 93 mA

P_i 660 mW

effective inner capacity C_i negligible

effective inner inductivity L_i negligible

plus line inductivities 1 μ H/m and line capacities 160 pF/m (cable supplied by the manufacturer)

The supply connections have an inner capacity of max. 27 nF to the housing.

Ambient temperature range -20 °C to +70 °C

[16] **Test report**

The test results are explained in detail in the test report IB-11-3-012/1. The test documents are part of the test report and listed there.

Summary of the test results:

The pressure transmitters AquaBar II und UniBar E II fulfil the requirements of type of protection Intrinsic Safety ‚ia‘ for an electrical equipment of the Equipment Group II, Category 1G and 1D, Explosion Group IIC or IIB and Temperature Class T4.

[17] **Special conditions**

- The equipment designed with connector have to be installed in such a way that the degree of protection IP 20 is always kept.
- The safety and assembly instructions contained in the operating instruction and the ambient temperature range $-20\text{ °C} \leq T_a \leq +70\text{ °C}$ have to be taken into account.
- The device may be operated in explosive atmospheres which requires equipment of Category 1 only when there are atmospheric conditions (temperature of -20 °C to +60 °C, pressure of 0.8 bar to 1.1 bar).

[18] **Essential Health and Safety Requirements**

Confirmed by compliance with standards (see [9]).

By order

Freiberg, 24 March 2011



(Dr. Wagner)

[1] **EC-TYPE EXAMINATION CERTIFICATE**
according to Directive 94/9/EC, Annex III



(Translation)

[2] Equipment and Protective Systems intended for use in Potentially Explosive Atmospheres, Directive 94/9/EC

[3] EC-Type Examination Certificate Number: **IBExU11ATEX1047 X**

[4] Equipment: **Pressure measuring device**
type NivuBar H III

[5] Manufacturer: NIVUS GmbH

[6] Address: Im Täle 2
75031 Eppingen
GERMANY

[7] The design of the equipment mentioned under [4] and any acceptable variation thereto are specified in the schedule to this EC-Type Examination Certificate.

[8] IBExU Institut für Sicherheitstechnik GmbH, NOTIFIED BODY number 0637 in accordance with article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that the under [4] mentioned 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 test results are recorded in the test report IB-11-3-012/2 of 25 March 2011.

[9] Compliance with the Essential Health and Safety Requirements has been assured by compliance with EN 60079-0:2009, EN 60079-11:2007, EN 60079-26:2007 and EN 61241-11:2006.

[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 under [17] in the schedule to this EC-Type Examination 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 mentioned in [4] shall include at least one of the following:

II 1G Ex ia IIB T4 Ga

II 1D Ex iaD 20 T85 °C

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Freiberg, 25 March 2011

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[13] **Schedule**

[14] **to the EC-TYPE EXAMINATION CERTIFICATE IBExU11ATEX1047 X**

[15] **Description of equipment**

The pressure measuring device NivuBar H III is a pressure transmitter in the high-grade steel enclosure or from CuNi10Fe1Mn. The equipment is intended for use in potentially hazardous areas, where category 1G or 1D devices are required. They are supplied by an intrinsically safe power supply of the Category „ia“.

Category 1 equipment

The sensor of the pressure measuring device may be operated in explosive atmospheres which requires equipment of category 1 only if there are atmospheric conditions (temperature from -20 °C to +60 °C, pressure from 0.8 bar to 1.1 bar).

Ambient temperature range: from -25 °C to +70 °C
Degree of protection of the enclosure: ≥ IP 67

Supply and signal electric circuit in type of protection Intrinsic Safety Ex ia IIB
(supply + and -)

	U_i	28 V
	I_i	93 mA
	P_i	660 mW
effective inner capacity	C_i	105 nF
effective inner inductivity	L_i	5 µH

plus line inductivities 1 µH/m and line capacities 160 pF/m

The supply connections have an inner capacity of max. 140 nF opposite the enclosure.

[16] **Test report**

The test results are explained in detail in the test report IB-11-3-012/2. The test documents are part of the test report and listed there.

Summary of the test results:

The pressure measuring device NivuBar H III fulfills the requirements of type of protection Intrinsic safety ‚ia‘ for an electrical component for equipment group II category 1G, explosion group IIB and temperature class T4 and category 1D with a maximum surface temperature of 85 °C.

[17] **Special conditions**

- The ambient temperature range is fixed from -25 °C to +70 °C.
- The safety and assembly notes contained in the operating instructions have to be observed.

[18] **Essential Health and Safety Requirements**

Confirmed by compliance with standards (see [9]).

By order

Freiberg, 25 March 2011



(Dr. Wagner)

[1] **EC-TYPE EXAMINATION CERTIFICATE**
according to Directive 94/9/EC, Annex III



(Translation)

- [2] Equipment and Protective Systems intended for use in Potentially Explosive Atmospheres, Directive 94/9/EC
- [3] EC-Type Examination Certificate Number: **IBExU05ATEX1193 X**
- [4] Equipment: Pressure measuring devices
types NivuBar Plus II, NivuBar G II and HydroBar G II
- [5] Manufacturer: Nivus GmbH
- [6] Address: Im Täle 2
75031 Eppingen Mühlbach
GERMANY
- [7] This equipment mentioned under [4] and any acceptable variation thereto are specified in the schedule to this EC-Type Examination Certificate.
- [8] IBExU Institut für Sicherheitstechnik GmbH, NOTIFIED BODY number 0637 in accordance with article 9 of the Council Directive 94/9/EC of 23rd 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 test report IB-05-3-358 of 10th January 2006.
- [9] Compliance with the Essential Health and Safety Requirements has been assured by compliance with EN 50014:1997+A1-A2, EN 50020:2002, EN 50284:1999 and EN 50281-1-1:1998+A1.
- [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 under [17] in the schedule to this EC-Type Examination 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 mentioned in [4] shall include the following:

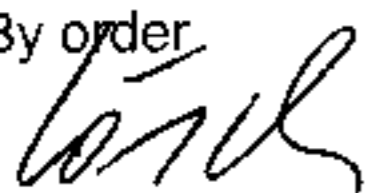
Ex II 1 G EEx ia IIC/IIB T4 Ex II 1 D IP 6X T 85 °C
-25 °C ≤ Ta ≤ +70 °C

The validity of the marking for the type of protection goes by the marking table.

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(Dr. Lösch)

- Seal -
(ID no. 0637)



Freiberg, 11th Januar 2006

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Schedule

[13] **Schedule**

[14] **to the EC-TYPE EXAMINATION CERTIFICATE IBExU05ATEX1193 X**

[15] **Description of equipment**

The Pressure measuring devices types NivuBar Plus II, NivuBar G II and HydroBar G II screwed probes and immersion probes represent with high-grade steel cover. It serves in intrinsic safety electrical plants for the transformation of a pressure signal in a proportional electrical signal.

The sensor of the pressure measuring device may only operate in explosive atmospheres which requires equipment of Category 1, if there are atmospheric conditions (temperature from -20 °C to +60 °C pressure from 0.8 bar to 1.1 bar).

Ambient temperature range	from -25 °C to +70 °C
Degree of protection:	better IP 66

Supply and signal electric circuit in type of protection Intrinsic Safety EEx ia IIC/IIB
Circuit diagram (XS1 and XS2)

	U_i	= 28 V
	I_i	= 93 mA
	P_i	= 660 mW
effective inner capacity	C_i	= 27 nF
effective inner inductivity	L_i	= 5 µH

plus cable inductivities 1 µH/m and cable capacities 100 pF/m

[16] **Test report**

The test results are recorded in detail in the test report IB-05-3-358 of 10th January 2006.

Summary of the Test Result:

The Pressure measuring devices types NivuBar Plus II, NivuBar G II and HydroBar G II fulfils the requirements of the type of protection Intrinsic Safety for an electrical apparatus for the Group II, depending on execution Explosion Group IIC or IIB and the Category 1G as well as requirements of Dust Explosion Protection.

[17] **Special conditions**

- At pressure measuring devices with cable protection of corrugated pipe, the ground clamp at the coupling has to be connected with the equipotential bonding.
- The safety and assembly notes contained in the operating instructions have to be observed.

[18] **Essential Health and Safety Requirements**

Confirmed by norms (see [9]).

By order

Freiberg, 11th January 2006



(Dr. Lösch)

IBExU Institut für Sicherheitstechnik GmbH
An-Institut der TU Bergakademie Freiberg

- [1] **1st Addition to**
EC-TYPE EXAMINATION CERTIFICATE IBExU05ATEX1193 X
according to Directive 94/9/EC, Annex III
- Translation -



- [2] Equipment: **Pressure measuring device**
type NivuBar Plus II, NivuBar G II and HydroBar G II
- [3] Manufacturer: NIVUS GmbH
- [4] Address: Im Täle 2
75031 Eppingen
Germany



- [5] **Addition / Alteration**
The additions / alterations of the equipment mentioned in [2] compared with the equipment already certified concern in detail:
- a) The pressure measuring device HydroBar G II is made in a additional field enclosure.
 - b) Into the pressure measuring device HydroBar G II can optional installed displays with 10 mm and 7 mm numerical height.
 - c) Alternatively use of a compatible new measuring cell.
 - d) Alternatively equipping of non safety-relevant parts for example varistors.
 - e) The equipment fulfils also the requirements of the current standard series EN 60079:2009.

- [6] **Test Report**
The proof of the explosion protection of the equipment mentioned in [2] is documented in the Test Report IB-10-3-12/4 of 25 March 2011. The test documents are part of the Test Report.

- [7] **Test result**
IBExU certifies that the equipment mentioned in [2] fulfils the Essential Health and Safety Requirements fixed in Annex II of the Directive 94/9/EC by compliance with EN 60079-0:2009, EN 60079-11:2007, EN 60079-26:2007 und EN 61241-11:2006.

The equipment stated under [2] fulfils the requirements of explosion protection for electrical equipment in type of protection Intrinsic safety 'ia', Explosion Group IIC/IIB, Temperature Class T4 respectively in dust-atmospheres with a surface temperature of maximum 85 °C for Equipment Group II, Category 1G respectively 1D.

The marking of the equipment stated under [2] shall include the following:

 **II 1G Ex ia IIC/IIB T4 Ga**
 **II 1D Ex iaD 20 T 85 °C**
-25 °C ≤ T_a ≤ +70 °C

The validity of the marking for the types of protection goes by the marking table in the Test Report.
This addition is only valid in combination with the EC-Type Examination Certificate IBExU05ATEX1093 X of 11 January 2006.
The safety instructions are unchanged and have to be taken into account furthermore.

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(Dr. Wagner)



- Seal -
(Identification No. 0637)

Freiberg, 25 March 2011

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