TÜV NORD

Schedule to EU-Type Examination Certificate No. TÜV 08 ATEX 554726 X issue 00

(17) Specific Conditions for Use

1. Metallic process connection parts have to be included in the local potential equalization.
2. The Bypass Level Indicator type BNA-S../.. EX...MA.... has to be installed and used in such a way that electrostatic charging from operation, maintenance or cleaning is excluded.

(18) Essential Health and Safety Requirements
No additional ones

- End of Certificate -

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Barksdale®
CONTROL PRODUCTS

Operating Instructions
Bypass level indicator

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CONTROL PRODUCTS

Barksdale GmbH
Dorn-Assenheimer Straße 27
D-61203 Reichelsheim

Phone: +49 (6035) 949-0
Fax: +49 (6035) 949-111 and 949-113
email: info@barksdale.de
Internet: www.barksdale.de

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Specifications are subject to changes without notice!

Refer to data sheet for further technical data.

Intended Applications

The Bypass Level Indicator (BNA) serves exclusively for indicating the level corresponding to that of the connected tank. Control devices such as solenoid switches or remote indicators can be additionally installed by Barksdale.

The manufacturer assumes the responsibility for correct execution of the equipment according to the orderer's instructions. The orderer assumes the responsibility for the correct installation and use of the equipment subject to the applicable national regulations.

DANGER

Read the operating instructions and the safety instructions carefully before using the Bypass Level Indicator. Nonobservance may cause injuries to health or material damage.
Barksdale GmbH cannot be held liable for any damage resulting from incorrect use.

The Bypass Level Indicators (BNA) must not be used in situations in which lives depend on proper functioning of the equipment.

The Bypass Level Indicator may only be used in the specified fields of application and with the permissible data (see nameplate). The temperature ranges must be within the permissible limits. The stated pressures and electrical load values must not be exceeded.

The orderer ensures that exothermic reactions or spontaneous gas-phase formation of the medium are impossible.

Observe also the applicable national safety instructions for assembly, commissioning and operation of the Bypass Level Indicator.

CAUTION

If the medium is water and there is a risk of icing the water must be discharged from the Bypass Level Indicator (BNA) or heating must be provided to prevent damage to the float or the indicator tube.

The maximum speed of the float caused by level changes must not exceed 1 m/s. If necessary a suitable screen must be installed by the orderer in the connection to the tank.

NOTE

Unless agreed otherwise the Bypass Level Indicator (BNA) is designed for static operating conditions. If any vibrations are to be expected, e.g. by pumps, compressors etc. the orderer must provide for adequate vibration absorption.

The classification of ex devices is stated on the nameplate and the EC type examination certificate.

The designation Ⓔx II 1G Ex h IIC T6…T1 Ga permits use in potentially explosive gas atmosphere outside the equipment in zone 0. Inside the equipment zone 0 is also permitted.

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CAUTION

Ⓔx If the Bypass Level Indicator (BNA) is determined for use in potentially explosive atmosphere, it must be checked whether the damper has been installed in the lower flange. The BNA must be suitable for the intended use according to its nameplate.

In case of use in zone 0, the maximum process temperatures according to the temperature class and the permissible pressure range in the tank of 0.8 to 1.1 bar absolute in case of potentially explosive temperature must be observed. If the Bypass Level Indicator (BNA) is used in a potentially explosive atmosphere outside the permissible pressure range and temperature range in the tank mentioned above, the type examination certificate serves only as a guideline.

Additional examinations for the specific operating conditions are recommended.

Safety Instructions

The safety instructions are intended to protect the user from dangerous situations and/or prevent material damage.

In the operating instructions the seriousness of the potential risk is designated by the following signal words:

DANGER

Refers to imminent danger to men.

Nonobservance may result in fatal injuries.

WARNING

Refers to a recognizable danger.

Nonobservance may result in fatal injuries, and destroy the equipment or plant parts.

CAUTION

Refers to a danger.

Nonobservance may result in minor injury and damage to the Bypass Level Indicator (BNA) and/or the plant.

☞	**NOTE**
Refers to important information essential to the user.	

Disposal

The Bypass Level Indicator must be disposed of correctly in accordance with the local regulations for electric/electronic equipment.

The Bypass Level Indicator must not be disposed of with the household garbage!

Standards

The standards applied during development, manufacture and configuration are listed in the CE conformity and manufacturer's declaration.

Warranty/Guaranty

Warranty

Our scope of delivery and services is governed by the legal warranties and warranty periods.

Terms of guaranty

We guaranty for function and material of the Bypass Level Indicator under normal operating and maintenance conditions in accordance with the statutory provisions.

Loss of guaranty

The agreed guaranty period will expire in case of:

- incorrect use
- modifications to the equipment
- incorrect installation
- incorrect handling or operation contrary to the provisions of these operating instructions

No liability is assumed for any damage resulting therefrom, or any consequential damage.

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Principle of Operation

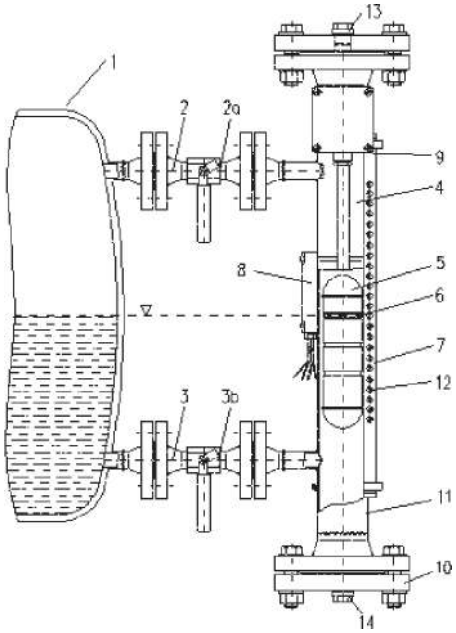

Figure 1: Sectional drawing BNA

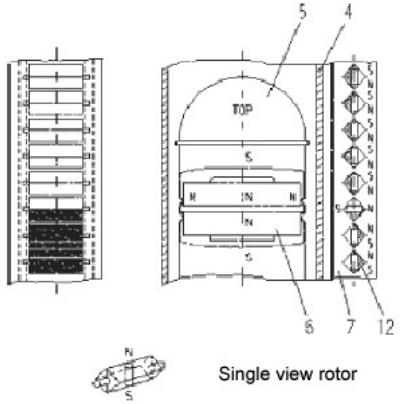

Figure 2:Detail - level indication BNA

The Bypass Level Indicator (BNA) works according to the principle of operation shown in figure 1.

The tank to be monitored (1/1) is connected with the Bypass Level Indicator (1/4) by two connecting lines (1/2 and 1/3). The liquid to be measured is always at the same level in the tank and in the Bypass Level Indicator.

The float (1/5) contains a magnetic system which acts on the one hand on the magnetic flags of the indication bar (1/7) and on the other hand on the limit switches (1/8) or on the electric transmitter (1/9).

Installation/Commissioning

DANGER

The electrical connection may only be made by trained expert staff!

Prior to any work on electrical components disconnect them from power supply.

NOTE

When the equipment is used in potentially explosive atmosphere chapter 0 „Intended Applications“ must be observed!

If the Bypass Level Indicator (BNA) is determined for use in potentially explosive atmosphere, it must be checked whether the damper has been installed in the lower flange. The BNA must be suitable for the intended use according to its nameplate.

DANGER

In ex areas, only equipment which is in conformity with ATEX may be used.
EN 60079-14 must be observed.

The BNA-EX must be integrated in the potential equalisation system via the tubing during installation.

Metallic process connection parts have to be included in the local potential equalization. The Bypass Level Indicator type BNA-S../..EX…MA….has to be installed and used in such a way that electrostatic charging from operation, maintenance or cleaning is excluded.

NOTE

Before further steps are taken the orderer must check whether the operating conditions agreed in the order are still valid. The equipment must be suitable for the intended purpose. This applies in particular to:

- the pressure, temperature, medium characteristics
- the classification according to the Pressure Equipment Directive
- possible additional loads

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Mechanical installation

Bypass Level Indicators (BNA) are measuring devices. Perform all work on BNA with utmost care.

- Check whether the Bypass Level Indicator (BNA) supplied is in conformity with your order specification.
- Check whether all parts are available and that the connection flanges of tank and indicator match. The float has been packaged and attached to the outside of the Bypass Level Indicator (BNA).
- Remove the bottom connection flange (1/10) from the BNA.
- Insert the float into the BNA in such a way that the mark (Top) points up.
- Attach the bottom connection flange with its gasket to the BNA.
- Tighten all screws crosswise.

CAUTION

During erection of the Bypass Level Indicator (BNA) the float may be damaged by bumping.

Erect the Bypass Level Indicator (BNA) slowly and carefully.

CAUTION

Frozen fluids on or in the Bypass Level Indicator (BNA) may cause faults or total failure.

If no liquid process medium can be guaranteed at low outdoor temperatures (risk of fluid freezing) the BNA must be protected against frost by suitable measures or emptied completely.

CAUTION

Thermal hazard from hot/cold surface of Bypass Level Indicator (BNA)

Do not touch the BNA with your bare hands. Wear protective gloves.

DANGER

Depressurize the system before carrying out any work on the Bypass Level Indicator (BNA)!

☞	NOTE

Ensure that the flanges of the tank are accurately aligned with the flanges of the BNA.

Non-alignment of the flanges causes seizing or distortion of the BNA (1/4). The float (1/5) may get jammed.

The principle of operation of the Bypass Level Indicator is based on the magnetic field principle. No **magnetic iron parts** (e. g. screws, clamps etc.) must be used in the vicinity of the level tube.

Observe the data in chapter 8 „Technical Data“.

- ➢ Install the BNA so that the nameplate (1/11) of the BNA (1/4) is located at the bottom.
- ➢ Align all indication rotors (2/12) by means of a magnet or the enclosed float. All rotors must show the colour white or silver;
  white: makrolon, medium temperature up to 150 °C or aluminium, medium temperature up to 350 °C
  silver: aluminium, medium temperature up to 200 °C
  The maximum ambient temperature is 120 °C.
- ➢ Ensure that all flange attachment screws, the vent plug (1/13) and the drain screw (1/14) are tightened or closed properly.

Torques for the screws:

Comply with the torque values provided in the pipeline construction.

Type	Screw dimension	Torque [Nm]
DN25 flange	M12	50
DN50 flange aramid fiber NBR	M20	240
DN50 flange comb profile seal	M20	150
Plug	G½, ½“ NPT	80
Fastening clamp	7 mm hexagon head	0.75

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Electrical installation

⚠	DANGER

The orderer must ensure that all applicable regulations are observed in the event that electric limit switches and remote indicators are used.

For further information about installation of the electric limit switches and remote indicators refer to the corresponding installation and operating instructions.

Commissioning

The Bypass Level Indicators (BNA) are specially made for a specific application. The most important data, such as flange, pressure, temperature and min. specific gravity of the float are specified on the nameplate (1/11).

- ➢ Check prior to commissioning whether the technical data according to the nameplate are in agreement with the plant requirements.

Operating pressure and operating temperature of the plant must not exceed the data stated on the nameplate of the Bypass Level Indicator. Exceeding the limit values will cause changes in the behaviour and service life of the BNA. If the proof pressure is exceeded, functioning of the BNA is no longer guaranteed and the BNA may be damaged.

- ➢ Ensure that - dependent on the type of medium to be measured - the appropriate safety precautions are taken.

Filling the Bypass Level Indicator

- ➢ Slowly open the top valve (1/2a).
- ➢ Slowly open the bottom valve (1/3b).

The liquid rises slowly in the BNA (1/4). The float (1/5) is lifted until the same level is reached in the tank (1/1) and in the BNA.

- ➢ Fully open the bottom valve (1/3b).

☞	NOTE

For pressures above 40 bar a vented float (additional designation: -VAE) is used which is provided with a small pressure compensation tube.

When using the VAE version take care that the temperature in the BNA and in the float rises evenly and slowly. The use of vented floats should be discussed with the manufacturer beforehand.

Maintenance

⚠	**DANGER**
Depressurize the system before carrying out any work on the Bypass Level Indicator (BNA)!	

⚠	**DANGER**
Ex	Maintenance must not be performed in a potentially explosive atmosphere.

If the liquid to be measured contains dirt particles which may deposit in the bottom part of the BNA:

➢ Determine the necessary time interval for cleaning.

☞	**NOTE**
Coated Bypass Level Indicators must be checked regularly - at least every 12 months - for damage to the coating.	

Cleaning

➢ Open the drain plug (1/14) or drain valve. Wash out the deposits.
➢ If there are any encrustations, remove the top and bottom flange (dependent on the model).
➢ Carefully remove the float.
➢ Clean the BNA mechanically.
➢ Check all flanges, discharge tubes and vent plugs for firm seat and tightness at regular intervals.
➢ Check the gaskets carefully. Replace graphite gaskets immediately when damaged.

☞	**NOTE**
The orderer must ensure that the inspection intervals required for his plant are observed. Indicators provided with a heating jacket covering the inner weld seams must be subjected to a pressure chamber leak test at intervals to be specified by the operator. This is to recognize corrosion-conditioned leaks of a weld seam exposed to the process medium, and to prevent that process medium from entering the heating circuit.	

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8 Technical Data

	BNA 21/22	BNA 31/36	BNA 41/42	BNA 45/46	BNA S51/S52
Tube and flange material	1.4571				
Float material	buna	1.4571 or titanium	1.4571 or titanium		
Media temperature range	Max. -10°C…+ 150°C (ex area according to ATEX see certificate)		Max. -10°C…+ 320°C (ex area according to ATEX see certificate)		
Process connection	G1/2“, on the side, ½” NPT		G1/2“, on the side, ½” NPT		
Maximum permissible pressure (PS) in bar	10	16	40	64	
Refer to data sheets for further technical data, dimensions and options					

Nameplate

For ex equipment (example)

.

9 EU type examination certificate

Ex equipment: observe the EU type examination certificate

Translation

(1) **EU-Type Examination Certificate**

(2) Equipment and protective systems intended for use in potentially explosive atmospheres, **Directive 2014/34/EU**

(3) **Certificate Number** **TÜV 08 ATEX 554726 X** **issue:** 00

(4) for the product: Bypass Level Indicator type BNA-S../.. EX…x….

(5) of the manufacturer: **Barksdale GmbH**

(6) Address: Dorn-Assenheimer Str. 27
61203 Reichelsheim
Germany

Order number: 8003003473

Date of issue: 2019-07-11

(7) The design of this product and any acceptable variation thereto are specified in the schedule to this EU-Type Examination Certificate and the documents therein referred to.

(8) The TÜV NORD CERT GmbH, Notified Body No. 0044, in accordance with Article 17 of the Directive 2014/34/EU of the European Parliament and the Council of 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive.
The examination and test results are recorded in the confidential ATEX Assessment Report No. 19 203 240045.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN ISO 80079-36:2016 **EN ISO 80079-37:2016**

except in respect of those requirements listed at item 18 of the schedule.

(10) If the sign "X" is placed after the certificate number, it indicates that the product is subject to the Specific Conditions for Use specified in the schedule to this certificate.

(11) This EU-Type Examination Certificate relates only to the design, and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this equipment. These are not covered by this certificate.

(12) The marking of the product shall include the following:

Ex **II 1 G Ex h IIC T6…T1 Ga**

TÜV NORD CERT GmbH, Langemarckstraße 20, 45141 Essen, notified by the central office of the countries for safety engineering (ZLS), Ident. Nr. 0044, legal successor of the TÜV NORD CERT GmbH & Co. KG Ident. Nr. 0032

The head of the notified body
Roder

Hanover office, Am TÜV 1, 30519 Hannover, Tel. +49 511 998-61455, Fax +49 511 998-61590

P17-F-011 Rev. 01/04.16

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(13) **SCHEDULE**

(14) **EU-Type Examination Certificate No. TÜV 08 ATEX 554726 X issue 00**

(15) Description of product
The Bypass Level Indicator type BNA-S../.. EX…x…. is used for indication of liquid levels in tanks and consists of a guide tube with float and an indication rail with freely moving indicator elements.
The above mentioned equipment is connected with the tank by side or top and bottom connections and can be designed with service-flanges.
A permanent magnet, mounted within the head of the float, actuates the indicator elements and indicates the consistent liquid level.

Type code

BNA- S..- EX …x….

Display
MA: Polycarbonate Macrolon rail
A2 or alternative AL: Aluminium rail

Ex-Version

Devices Version
21 PN16, top + bottom connections G1/2
22 PN16, side connections
31 PN16, top + bottom connections G1/2, bottom service-flange
32 PN16, side connections, bottom service-flange
35 PN16, top + bottom connections G1/2, top + bottom service-flange
36 PN16, side connections, top + bottom service-flange
41 PN40, top + bottom connections G1/2, service-flange bottom
42 PN40, side connections, service-flange bottom
45 PN40, top + bottom connections G1/2, bottom + top service-flange
46 PN40, side connections, bottom + top service-flange

Barksdale Niveau-Anzeiger (Barksdale Level Indicator)

Technical data

Range of permitted process pressure in presence of potentially explosive atmosphere	0.8 to 1.1 bar absolute
Max. flow rate	1 m/s

Temperature class	Ambient temperature range = Medium temperature range
T6	-40°C … +68 °C
T5	-40°C … +80 °C
T4	-40°C … +108 °C
T3	-40°C … +160 °C
T2	-40°C … +240 °C
T1	-40°C … +320 °C

(16) Drawings and documents are listed in the ATEX Assessment Report No. 19 203 240045

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