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## Описание на керамические защищенные зонды. Модель 3300 XL

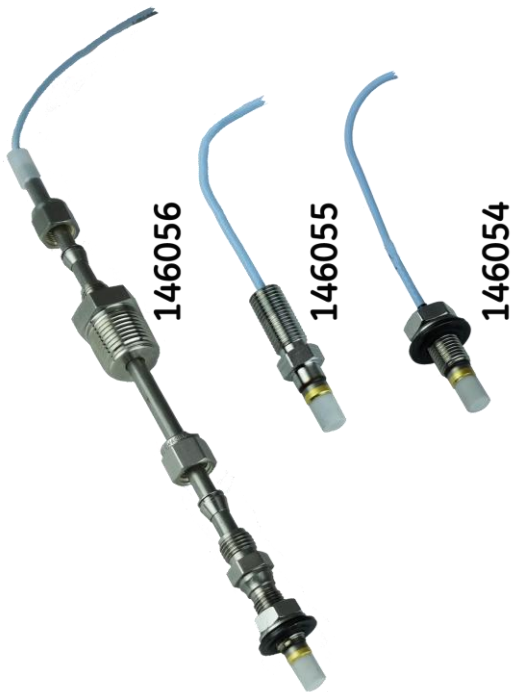


**BENTLY**  
Nevada

# 3300 XL Ceramic Capped Probe

Bently Nevada\* Asset Condition Monitoring

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## Description

The 3300 XL Ceramic Capped Probe is a state-of-the-art solution for monitoring machinery in aggressive chemical or high-pressure environments. The alumina cap and 304 stainless steel probe case provide robust protection and increased life for applications in anhydrous ammonia or other extreme pH environments. The ceramic capped probe is compatible with the 3300 XL Proximitor\* Sensor and extension cable.

Our Bently Nevada\* ceramic-capped probes are rated to 34 Bar (500 psi) pressure. Modifications are available for applications involving higher pressures.

The 146054, 146055, and 164517 probes were developed for applications that expose only the front of the probe case assembly to corrosive gases and liquids. These ceramic probe assemblies prevent corrosive gases and liquids from entering the front end of the probe case. We leak test the front-end ceramic to metal interface with helium to ensure a hermetic seal. These probes do not have a rear fitting or stainless steel tube, so that the rear of the probes are *not* sealed. You must not expose the rear of these probes to destructive environments such as water, NH<sub>3</sub>, NH<sub>4</sub>OH, hydrogen sulfide, etc.

The 146056 ceramic probe assembly has the rear fitting and stainless steel tubing to prevent corrosive gases and liquids from entering both the front and rear of the probe case. We leak test the front-end ceramic to metal interface with helium to ensure a hermetic seal. The fitting at the rear end of the probe is unsealed when it leaves the factory. You can disconnect the tubing and the fittings from the probe case and slide them out of the way while gapping and installing the probe. Once you have secured and correctly gapped the probe, you should tighten the fittings to completely seal the rear of the probe.



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## Specifications

Unless otherwise noted, the following specifications are for a 3300 5mm system including Proximitor Sensor, extension cable and probe between +18 °C and +27 °C (+64 °F to +80 °F), with a -24 Vdc power supply, a 10 kΩ load, and an AISI 4140 steel target. Performance characteristics apply to systems that consist solely of 3300 XL components. The system accuracy and interchangeability specifications do not apply when using a transducer system calibrated to any target other than our AISI 4140 steel target.

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### Electrical

#### Probe Nominal DC Resistance

See Table 1.

**Table 1: Probe Nominal DC Resistance**

Probe Length	Resistance from the Center Conductor to the Outer Conductor (ohms)
0.5	7.45 ± 0.50
1.0	7.59 ± 0.50
2.0	7.88 ± 0.50
5.0	8.73 ± 0.70
9.0	9.87 ± 0.90

#### Linear Range

1.52 mm (60 mils). Linear range begins at approximately 0.25 mm (10 mils) from target and is from 0.25 to 1.78 mm (10 to 70 mils) (approximately -4 to -16 Vdc).

#### Recommended Gap Setting

1.0 mm (40 mils)

The linear range of the ceramic-capped probes are shifted compared with standard 3300XL probes. The probes are very robust but cannot withstand direct mechanical loads on the probe tip. Gap the probe electrically and avoid contact with the target surface.

Configuring the monitor when using ceramic-capped probes requires extra care. Due to the shift in the curve from that of a standard 3300 XL probe, the probe tip may contact the shaft before the probe reaches lower OK limit. Your installation may require a monitor modification to accommodate this condition.

#### Incremental Scale Factor (ISF)

##### *Standard 5-metre or 9-metre system*

7.87 V/mm (200 mV/mil) ±6.5% including interchangeability error when measured in increments of 0.25 mm (10 mils) over the 60 mil linear range from 0 °C to +45 °C (+32 °F to +113 °F)..

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### Hazardous Area Approvals

#### CSA/NRTL/C

Ex ia IIC

Class I, Div. 1

Groups A, B, C & D

T5 @ Ta = -51 °C to +40 °C

Per drawings 141092, 140979, CA22000

Ex nA IIC

Class I, Div. 2

Groups A, B, C & D

T5 @ Ta = -51 °C to +40 °C

Per drawings 141092, 140979, CA22000

#### ATEX

 II I G

EEx ia IIC

T1 to T5 @ Ta as shown in Table 2.

**Table 2: ATEX Temperature Classes**

Temperature Class	Ambient Temperature
T1	-51 °C to +232 °C
T2	-51 °C to +177 °C
T3	-51 °C to +120 °C
T4	-51 °C to +80 °C
T5	-51 °C to +40 °C

When installed per drawing #142491.

Certification Number

BAS99ATEX1099/X



II 3 G

EEx nA II

T1...T5 @ T<sub>a</sub> as shown in Table 3.

**Table 3: ATEX Temperature Classes**

Temperature Class	Ambient Temperature
T1	-51 °C to +232 °C
T2	-51 °C to +177 °C
T3	-51 °C to +120 °C
T4	-51 °C to +80 °C
T5	-51 °C to +40 °C

When installed per drawing #142491.

Certification Number

BAS99ATEX3098/X

IEC

Ex ia IIC T4

The unit has the following electrical parameters:

U<sub>i</sub> = -28 V      C<sub>i</sub> = 1.5 nF

I<sub>i</sub> = 140 mA      L<sub>i</sub> = 200 µH

P<sub>i</sub> = 0.84 W

Certification Number

IECEX BAS 04.0056

Ex nA II

The unit has the following electrical parameters:

U<sub>i</sub> = -28 V

Certification Number

IECEX BAS 04.0058X

**Mechanical**

**Probe Tip Material**

Alumina ceramic (AlO<sub>3</sub>)

**Probe Case Material**

AISI 304 stainless steel.

**Probe Cable Specifications**

Standard cable:

75 Ω coaxial, fluoroethylene propylene (FEP) insulated probe cable in the following total probe lengths: 0.5, 1, 2, 5, or 9 metres.

**Connectors**

The 3300 XL probe has corrosion-resistant, gold-plated ClickLoc\* connectors. These connectors require only finger-tight torque (connectors will "click"), and the specially engineered locking mechanism prevents the connectors from loosening. The connectors require no special tools for installation or removal. The connector can be ordered in a removable nut configuration, or as the standard ClickLoc connector on probe 146056.

You can also order 3300 XL Probes with connector protectors already installed or supplied separately for installation in the field (such as when you must run the cable through restrictive conduit). We recommend connector protectors for all installations to provide increased environmental protection.

**Connector Material**

Gold-plated brass or gold-plated beryllium copper.

**Table 4: Connector Tightening Instructions**

Connector Type	Tightening Instructions
2 3300 XL gold "click" type connectors	Finger tight
1 non-XL stainless steel connector and 1 3300 XL connector	Finger tight plus 1/8 turn using pliers

**Maximum Torque**

0.565 N•m (5 in•lbf)

**Cable Minimum Bend Radius**

25.4 mm (1.0 in)

**Environmental Limits**

**Probe Temperature Range**

**Operating and Storage Temperature:**

-51 °C to +177 °C (-60 °F to +351 °F)

**Probe Pressure:**

Rated to seal 34 Bar (500 psi) nitrogen. Modifications are available for higher-pressure applications. Contact our custom design department if you require a test of the pressure seal for your application.

**Note:** It is the responsibility of the customer or user to ensure that all liquids and gases are contained and safely controlled should leakage occur from a proximity probe. Bently Nevada LLC will not be held responsible for any damages resulting from leaking proximity probes.

**Ordering Information**

For a detailed listing of country and product specific approvals, refer to the *Approvals Quick Reference Guide* (document 108M1756) located at the following website: [www.GEmeasurement.com](http://www.GEmeasurement.com).

**3300 XL Ceramic Capped Proximity Probes**

**146054** 3300 XL Ceramic Capped Probe, 3/8-24 UNF thread, without armor

**146054 with Modification 164523** 3300 XL Ceramic Capped Probe, 3/8-24 UNF thread, with armor

**Part Number-AXX-BXX-CXX-DXX**

**A: Overall Case Length Option**

Order in increments of 0.1 in  
**Threaded length configurations:**  
**Maximum case length:** 4.0 in  
**Minimum case length:** 0.8 in  
**Example: 2 4 = 2.4 in**

**B: Total Length Option**

**05** 0.5 metre (1.6 feet)  
**10** 1.0 metre (3.3 feet)  
**20** 2.0 metres (6.6 feet)  
**50** 5.0 metres (16.4 feet)<sup>1</sup>  
**90** 9.0 metres (29.5 feet)

**C: Connector and Cable-Type Option**

**01** Miniature coaxial ClickLoc connector with connector protector, standard cable  
**02** Miniature coaxial ClickLoc connector, standard cable

**D: Agency Approval Option**

**00** Not required  
**05** CSA, ATEX, IECEx

**3300 XL Ceramic Capped Proximity Probes, Metric:**

**164517**, 3300 XL Ceramic Capped Probe, M10 x 1 thread, without armor

**164517 with Modification 172330**, 3300 XL Ceramic Capped Probe, M10 x 1 thread, with armor

**Part Number-AXX-BXX-CXX-DXX**

**A: Overall Case Length Option**

Order in increments of 1 mm.  
**Metric thread configurations:**  
**Maximum length:** 100 mm  
**Minimum length:** 20 mm  
**Example: 0 6 0 = 60 mm**

**B: Total Length Option**

**05** 0.5 metre (1.6 feet)  
**10** 1.0 metre (3.3 feet)  
**20** 2.0 metres (6.6 feet)  
**50** 5.0 metres (16.4 feet)<sup>1</sup>  
**90** 9.0 metres (29.5 feet)

**C: Connector and Cable-Type Option**

- 0 1 Miniature coaxial ClickLoc connector with connector protector, standard cable
- 0 2 Miniature coaxial ClickLoc connector, standard cable

D: Agency Approval Option

- 0 0 Not required
- 0 5 Multiple Approvals

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### 3300 XL Ceramic Capped Reverse Mount Probes

146055, 3/8-24 UNF threads<sup>2</sup>

#### Option Descriptions

A: Total Length Option

- 0 5 0.5 metre (1.6 feet)
- 1 0 1.0 metre (3.3 feet)
- 2 0 2.0 metres (6.6 feet)
- 5 0 5.0 metres (16.4 feet)<sup>1</sup>
- 9 0 9.0 metres (29.5 feet)

B: Connector Option

- 0 2 Miniature ClickLoc coaxial connector, standard cable

C: Agency Approval Option

- 0 0 Not required
- 0 5 Multiple Approvals

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### 3300 XL Ceramic Capped Proximity Probes, Special Cable Protection:

146056, 3300 XL Ceramic Capped Probe, 3/8-24 thread with Stainless Steel tubing

Part Number-AXX-BXX-CXX-DXX-EXX

A: Overall Case Length Option

Order in increments of 0.1 in  
**Threaded length configurations:**  
**Maximum case length:** 4.0 in  
**Minimum case length:** 0.8 in  
**Example:** 2 5 = 2.5 in

B: Total Length Option

- 0 5 0.5 metre (1.6 feet)
- 1 0 1.0 metre (3.3 feet)
- 2 0 2.0 metres (6.6 feet)
- 5 0 5.0 metres (16.4 feet)<sup>1</sup>
- 9 0 9.0 metres (29.5 feet)

C: NPT Exit Fitting

- 0 1 1/4" NPT
- 0 2 1/2" NPT

D: Connector Option

- 0 2 Miniature ClickLoc coaxial connector, standard cable
- 0 3 Removable nut ClickLoc coaxial connector, standard cable

E: Agency Approval Option

- 0 0 Not required
- 0 5 Multiple Approvals

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## Accessories

### 40113-02

**Connector Protector Kit** Connector Protector Kit for probes and extension cables, including installation tools. You must order the 03800001 connector protector separately.

### 136536-01

**Connector Protector Adapter** Allows you to use connector protector installation tools manufactured prior to 1998 with 75 Ω ClickLoc connectors.

### 03839410

**75 Ω Triaxial Male Connector Protector** Male connector protectors are installed onto the extension cable and attach to the female connector protector on the probe, providing environmental protection of connectors.

### 03800001

**75 Ω Coaxial Female Connector Protector** Female connector protectors are installed onto the probe lead and attach to the male connector protector on the extension cable, providing environmental protection of connectors. Also placed on the extension cable to slide over the connection to the Proximitor sensor and protect it from the environment.

### 04301007

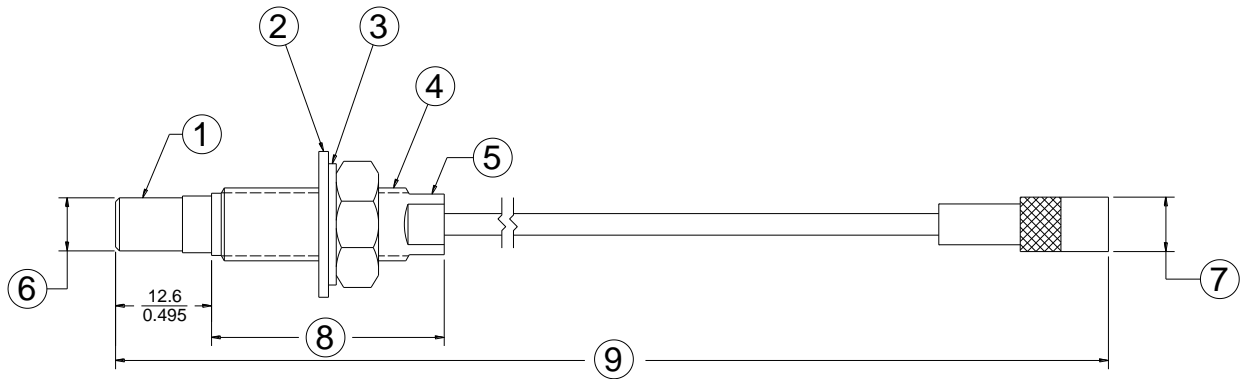
**3/8-24 Probe Lock Nut with safety wire holes** Single probe lock nut with two holes drilled through the nut in order to secure the lock nut in place with safety wire.

### Bently\_Manuals

Customer DVD containing all Bently Manuals, FWD, App Notes, and Install Guides in all available languages.

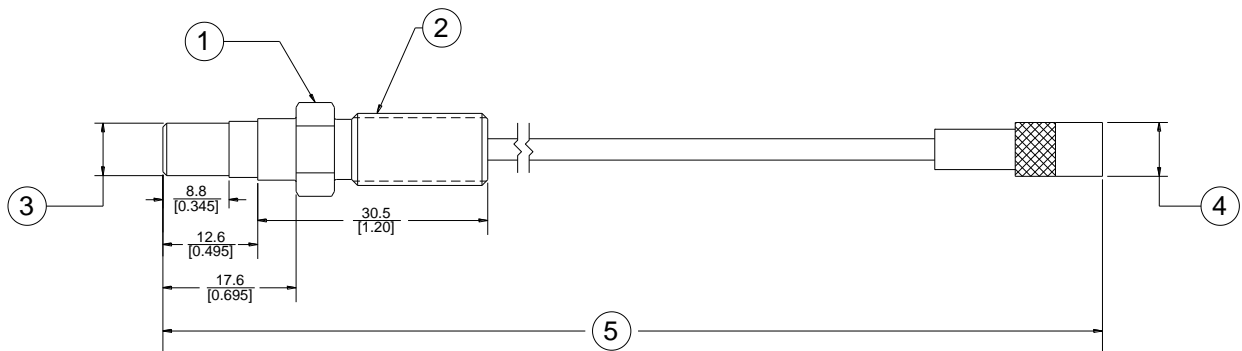
# Graphs and Dimensional Drawings

Note: All dimensions shown in millimetres [inches] except as noted



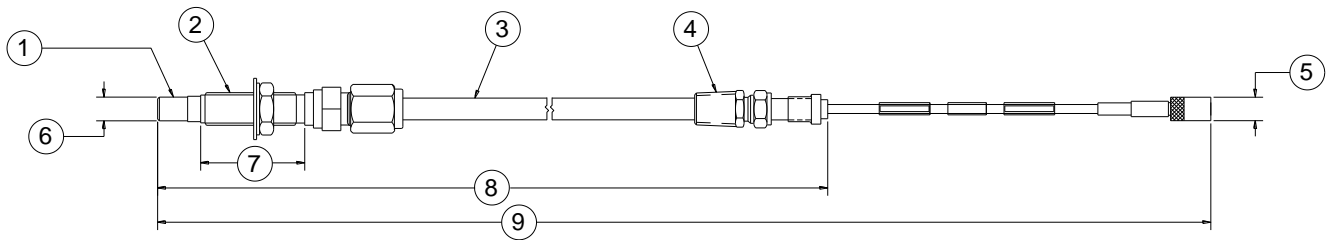
1. Ceramic capped tip
2. Pressure sealing washer
3. Flat washer
4. Probe threads, 3/8-24 UNF 2A
5. 5/16-in wrench flats
6. 7.0 mm [0.273 in] diameter
7. 7.2 mm [0.285 in] diameter
8. Case length, 102 mm [4.0 in] maximum length
9. Total length

**Figure 1 - Probe 146054, 3/8-24 Thread Forward Mount (Note 4-inch maximum case length)**



1. 7/16-in Wrench flats
2. 3/8-24 UNF 2A Mounting threads
3. 7.0 mm [0.273 in] diameter
4. 7.2 mm [0.285 in] diameter
5. Total length

**Figure 2 - Probe 146055, 3/8-24 Thread Reverse Mount, Suitable For Use In 31000 or 21000 Housings.**



1. Ceramic capped tip
2. 3/8-24 UNF 2A mounting threads
3. Stainless steel tubing, 6.3 mm (0.25 in) outside diameter
4. 1/4-in or 1/2-in NPT exit fitting
5. 7.2 mm (0,285 in) diameter
6. 6.9 mm (0.273 in) diameter
7. Case length
8.  $9.50 \pm 0.25$  in for 0.5 m length probes,  $20 \pm 1$  in for 1.0 m length probes,  $60 \pm 1.0$  in for 2.0 m and longer length probes
9. Total length

**Figure 3 - Probe 146056, 3/8-24 Thread, Forward Mount With Stainless Steel Tubing Protecting Probe Cable.**

**Notes:**

1. Probes ordered with 5- or 9-metre integral cables have a length tolerance of +20%, -0%.
2. Reverse mount probes are not available with armor or connector protector options.
3. Five metre probes are designed for use with the five metre Proximity Sensor only.
4. Proximity Sensors are supplied (by default) from the factory calibrated to AISI 4140 steel. Calibration to other target materials is available upon request



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