MANUFACTURER DOCUMENT PACKAGE

# Manufacturer's Manual

Reference package for procurement and maintenance review

BENTLY NEVADA

## 330104-01-09-90-01-05

**3300 XL 8 MM METRIC ARMORED PROXIMITY PROBE**

Used with the applicable 3300 XL 8 mm Proximity Transducer configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

Source: Baker Hughes Bently Nevada 3300 XL 8 mm Proximity Transducer System Datasheet 141194

EXACT ARTICLE CONFIGURATION

# 330104-01-09-90-01-05

3300 XL 8 mm metric armored proximity probe

The exact order-code options and applicable technical values are recorded below.

| | |
|---|---|
| Probe thread | **M10 × 1** |
| Cable armor | **Stainless steel armor** |
| Unthreaded length | **10 mm** |
| Overall case length | **90 mm** |
| Total cable length | **9.0 m** |
| Connector option | **ClickLoc with connector protector** |
| Approval option | **Multiple approvals** |
| Probe tip diameter | **8 mm** |
| Power supply | **-17.5 to -26 V DC** |
| Maximum current | **12 mA** |
| Linear range | **0.25 to 2.30 mm** |
| Scale factor | **7.87 V/mm** |
| Frequency response | **0 to 10 kHz** |
| Cable impedance | **75 ohm triaxial** |
| Probe temperature | **-51 to +177 °C** |

Source: Baker Hughes Bently Nevada 3300 XL 8 mm Proximity Transducer System Datasheet 141194

# 3300 XL 8 mm Proximity Transducer System

## Datasheet

Cordant™

141194 Rev. AM




## Description

The 3300 XL 8 mm Proximity Transducer System consists of:

- One 3300 XL 8 mm probe,
- One 3300 XL extension cable[1], and
- One 3300 XL Proximitor Sensor[2].

The system provides an output voltage that is directly proportional to the distance between the probe tip and the observed conductive surface and can measure both static (position) and dynamic (vibration) values. The system's primary applications are vibration and position measurements on fluid-film bearing machines, as well as Keyphasor reference and speed measurements[3].

The 3300 XL 8 mm system delivers the most advanced performance in our eddy current proximity transducer systems. The standard 3300 XL 8 mm 5-meter system also fully complies with the American Petroleum Institute's (API) 670 Standard for mechanical configuration, linear range, accuracy, and temperature stability. All 3300 XL 8 mm proximity transducer systems provide this level of performance and support complete interchangeability of probes, extension cables, and Proximitor sensors, eliminating the need to match or bench calibrate individual components.

Each 3300 XL 8 mm Transducer System component is backward compatible and interchangeable[4] with other non-XL 3300 series 5 mm and 8 mm transducer system components[5]. This compatibility includes the 3300 5 mm probe, for applications in which an 8 mm probe is too large for the available mounting space[6,7].

Baker Hughes

## Proximitor Sensor

The 3300 XL Proximitor Sensor incorporates numerous improvements over previous designs. Its physical packaging allows you to use it in high-density DIN-rail installations. You can also mount the sensor in a traditional panel mount configuration, where it shares an identical 4-hole mounting “footprint” with older Proximitor Sensor designs. The mounting base for either option provides electrical isolation and eliminates the need for separate isolator plates. The 3300 XL Proximitor Sensor is highly immune to radio frequency interference, allowing you to install it in fiberglass housings without adverse effects from nearby radio frequency signals. The 3300 XL Proximitor Sensor’s improved RFI/EMI immunity satisfies European CE mark approvals without requiring special shielded conduit or metallic housings, resulting in lower installation costs and complexity.

The 3300 XL’s SpringLoc terminal strips require no special installation tools and facilitate faster, more robust field wiring connections by eliminating screw-type clamping mechanisms that can loosen.

## Proximity Probe and Extension Cable

The 3300 XL probe and extension cable also reflect improvements over previous designs. A patented TipLoc molding method provides a more robust bond between the probe tip and the probe body. The probe’s cable incorporates a patented CableLoc design that provides 330 N (75 lbf) pull strength to more securely attach the probe cable and probe tip.

You can also order 3300 XL 8 mm probes and extension cables with an optional FluidLoc cable option. This option prevents oil and other liquids from leaking out of the machine through the cable’s interior.

## Connectors

The 3300 XL probe, extension cable, and Proximitor sensor have corrosion-resistant, gold-plated ClickLoc connectors. These connectors require only finger-tight torque (the connectors will "click" when tight), and the specially-engineered locking mechanism prevents the connectors from loosening. These connectors require no special tools for installation or removal.

You can order the 3300 XL 8 mm probes and extension cables with connector protectors already installed. We can also supply connector protectors separately for field installations (such as when an application must run the cable through restrictive conduit). We recommend connector protectors for all installations to provide increased environmental protection[8].

## Extended Temperature Range Applications

An extended temperature range (ETR) probe and ETR extension cable are available for applications in which either the probe lead or extension cable may exceed the standard 177°C (350°F) temperature specification. The ETR probe has an extended temperature rating for up to 218°C (425°F). The ETR extension cable rating is up to 260°C (500°F). Both the ETR probe and cable are compatible with standard temperature probes and cables, for example, you can utilize an ETR probe with the 330130 extension cable. The ETR system uses the standard 3300 XL Proximitor Sensor. Note that when you use any ETR component as part of your system, the ETR component limits the system accuracy to the accuracy of the ETR system.

### Description Notes:

1. One-meter systems do not use an extension cable.

2. Proximitor sensors are supplied by default from the factory calibrated to AISI 4140 steel. Calibration to other target materials is available upon request.

3. Consult Bently Nevada Applications Note, Considerations when using Eddy Current Proximity Probes for Overspeed Protection Applications, when considering this transducer system for tachometer or overspeed measurements.

4. 3300 XL 8 mm components are both electrically and physically interchangeable with non-XL 3300 5 mm and 8 mm components. Although the packaging of the 3300 XL Proximitor Sensor differs from its predecessor, its design fits in the same 4-hole mounting pattern when used with the 4-hole mounting base, and will fit within the same mounting space specifications (when minimum permissible cable bend radius is observed).

5. Mixing XL and non-XL 3300-series 5 mm and 8 mm system components limits system performance to the specifications for the non-XL 3300 5 mm and 8 mm Transducer System.

6. The 3300-series 5 mm probe (refer to Document 141605) uses smaller physical packaging, but does not reduce the side view clearances or tip-to-tip spacing requirements as compared to an 8mm probe. It is used when physical (not electrical) constraints preclude the use of an 8 mm probe. When your application requires narrow side view probes, use the 3300 NSv Proximity Transducer System (refer to Document 147385).

7. 8 mm probes provide a thicker encapsulation of the probe coil in the molded PPS plastic probe tip. This results in a more rugged probe. The larger diameter of the probe body also provides a stronger, more robust case. We recommend that you use 8 mm probes when possible to provide optimal robustness against physical abuse.

8. Each 3300 XL extension cable includes silicone tape that you can use instead of connector protectors. We do not recommend silicone tape for applications that will expose the probe-to-extension cable connection to turbine oil.

# Specifications

Unless otherwise noted, the following specifications are for a 3300 XL 8 mm Proximitor Sensor, extension cable and 8 mm probe between +18°C and +27°C (+64°F to +80°F) at a maximum altitude of 2000 meters, with a -24 Vdc power supply, a 10 kΩ load, an AISI 4140 steel target, and a probe gapped at 1.27 mm (50 mils). Performance characteristics apply to systems that consist solely of 3300 XL 8 mm components. The system accuracy and interchangeability specifications do not apply to transducer systems that are calibrated to any target other than our AISI 4140 steel target.

## Electrical

| | |
|---|---|
| Proximitor Sensor Input | Accepts one non-contacting 3300-series 5 mm, 3300 XL 8 mm Proximity Probe and Extension Cable. |
| Power | Requires -17.5 Vdc to -26 Vdc when installed with non-incendive circuit connected per installation drawing 140979 at 12 mA maximum consumption, -23 Vdc to -26 Vdc with barriers. Operation at a more positive voltage than -23.5 Vdc can result in reduced linear range. |
| Supply Sensitivity | Less than 2 mV change in output voltage per volt change in input voltage. |
| Output Resistance | 50 Ω |

| Nominal Probe DC Resistance | |
|---|---|
| Resistance ($R_{PROBE}$) from Center Conductor to Outer Conductor | |
| **Probe Length (m)** | **$R_{PROBE}$(Ω)** |
| 0.5 | 7.45 ± 0.50 |
| 1.0 | 7.59 ± 0.50 |
| 1.5 | 7.73 ± 0.50 |
| 2.0 | 7.88 ± 0.50 |
| 3.0 | 8.17 ± 0.50 |
| 5.0 | 8.73 ± 0.50 |
| 9.0 | 9.87 ± 0.50 |

| Nominal Extension Cable DC Resistance | |
|---|---|
| Resistance ($R_{CORE}$) from Center Conductor to Center Conductor | |
| **Length of Extension Cable (m)** | **RCORE (Ω)** |
| 3.0 | 0.66 ± 0.10 |
| 3.5 | 0.77 ± 0.12 |
| 4.0 | 0.88 ± 0.13 |
| 4.5 | 0.99 ± 0.15 |
| 6.0 | 1.32 ± 0.21 |
| 7.0 | 1.54 ± 0.23 |
| 7.5 | 1.65 ± 0.25 |
| 8.0 | 1.76 ± 0.26 |
| 8.5 | 1.87 ± 0.28 |

# Ordering Information

For the detailed listing of country and product-specific approvals, refer to the *Approvals Quick Reference Guide (108M1756)*.

For additional technical documentation, please log in to bntechsupport.com and access the Bently Nevada Media Library.

## Ordering Information for Probes

### 3300 XL 8 mm Proximity Probes:

**330101** 3300 XL 8 mm Probe, 3/8-24 UNF thread, without armor(2)

**330102** 3300 XL 8 mm Probe, 3/8-24 UNF thread, with armor(2)

**Part Number-AA-BB-CC-DD-EE**

| **A: Unthreaded Length Option** | |
|---|---|
| Unthreaded length must be at least 0.8 in. less than the case length. | |
| Order in increments of 0.1 in.<br>**Length configurations:**<br>Maximum unthreaded length: 8.8 in.<br>Minimum unthreaded length: 0.0 in.<br>Example: **0 4** = 0.4 in. | |
| **B: Overall Case Length Option** | |
| Order in increments of 0.1 in.<br>**Standard thread configurations:**<br>Maximum case length: 9.6 in.<br>Minimum case length: 0.8 in.<br>Example: **2 4** = 2.4 in. | |
| **C: Total Length Option** | |
| **05** | 0.5 meter (1.6 feet) |
| **10** | 1.0 meter (3.3 feet) |
| **15** | 1.5 meter (4.9 feet) |
| **20** | 2.0 meters (6.6 feet) |
| **30** | 3.0 meters (9.8 feet) |
| **50** | 5.0 meters (16.4 feet) |
| **90** | 9.0 meters (29.5 feet) |

3-meter length option is only available on 330101 probes, and is designed for use with the 9 meter Proximitor sensor only.

5-meter probes are designed for use with the 5 meter Proximitor sensor only.

| **D: Connector and Cable-Type Option** | |
|---|---|
| **01** | Miniature coaxial ClickLoc connector with connector protector, standard cable |
| **02** | Miniature coaxial ClickLoc connector, standard cable |
| **11** | Miniature coaxial ClickLoc connector with connector protector, FluidLoc cable |
| **12** | Miniature coaxial ClickLoc connector, FluidLoc cable |
| **E: Agency Approval Option** | |
| **00** | Not required |
| **05** | CSA, ATEX, IECEx Approvals |

### 3300 XL 8 mm Proximity Probes, Metric:

**330103** 3300 XL 8 mm Probe, M10 x 1 thread, without armor (2)

**330104** 3300 XL 8 mm Probe, M10 x 1 thread, with armor (2)

**Part Number-AA-BB-CC-DD-EE**

| **A: Unthreaded Length Option** |
|---|

| A: Overall Case Length Option |
|---|
| Order in increments of 0.5 in.<br>**Length configurations:**<br>Maximum unthreaded length: 9.5 in.<br>Minimum unthreaded length: 1.0 in.<br>Example: **3 5** = 3.5 in. |

| B: Total Length Option | |
|---|---|
| **05** | 0.5 meter (1.6 feet) |
| **10** | 1.0 meter (3.3 feet) |
| **15** | 1.5 meter (4.9 feet) |
| **20** | 2.0 meters (6.6 feet) |
| **50** | 5.0 meters (16.4 feet) |
| **90** | 9.0 meters (29.5 feet) |

5-meter probes are designed for use with the 5 meter Proximitor sensor only.

| C: Agency Approval Option | |
|---|---|
| **00** | Not required |
| **05** | CSA, ATEX, IECEx Approvals |

## Aluminum probe clamp bracket[1]

**137491-AA**

| A: Mounting screw option | |
|---|---|
| **01** | 10-24 UNC-2A mounting screws |
| **02** | M5 x 0.8-6g mounting screws |

The aluminum clamp bracket is an unthreaded mounting bracket designed for use with the smooth case probes (330140, 330141, 330197 and 330198). After gapping the probe, tighten the clamp bracket by tightening the screws. The mounting screws have pre-drilled holes for safety wire.

## Aluminum probe threaded mounting bracket

**137492-AA**

| A: Thread size | |
|---|---|
| **01** | 3/8-24 |
| **04** | M10 x 1 |

The aluminum probe threaded mounting bracket is the standard mounting bracket for most 3300 and 3300 XL probe installations. The -01 option includes two 10-24 UNC-2A mounting screws. The -04 option includes two M5 x 0.8-6g mounting screws. The mounting screws have pre-drilled holes for safety wire.

## Phenolic threaded probe mounting bracket

**27474-AA**

| A: Thread size | |
|---|---|
| **01** | 3/8-24 |
| **04** | M10 x 1 |

Bently Nevada recommends the phenolic threaded mounting bracket if your application requires additional electric isolation from the mounting location (as in some generator and electrical motor bearing locations). The -01 option includes two 10-24 UNC-2A mounting screws. The -04 option includes two M5 x 0.8-6g mounting screws. The mounting screws have pre-drilled holes for safety wire.

**Probe Ordering Information Notes:**

1. Mounting clamps must be ordered separately for 330140, 330141, 330197, and 330198.
2. For a shorter delivery time, order commonly stocked probes. The following part numbers are currently stocked probes:

330101-00-08-05-02-00, 330101-00-08-05-02-05, 330101-00-08-10-02-00, 330101-00-08-10-02-05, 330101-00-12-10-02-00, 330101-00-12-10-02-05, 330101-00-16-10-02-00, 330101-00-16-10-02-05, 330101-00-20-05-02-00, 330101-00-20-10-02-00, 330101-00-20-10-02-05, 330101-00-30-10-02-00, 330101-00-30-10-02-05, 330101-00-40-05-02-00, 330101-00-40-10-02-00, 330101-00-40-10-02-05, 330101-00-60-10-02-00, 330101-00-60-10-02-05, 330102-00-20-10-02-00, 330103-00-02-10-02-05, 330103-00-04-10-02-00, 330103-00-05-10-02-00, 330104-00-06-10-02-00, 330104-01-05-50-02-00, 330105-02-12-05-02-00, 330105-02-12-05-02-05, 330105-02-12-10-02-00, 330105-02-12-10-02-05, 330106-05-30-05-02-00, 330106-05-30-05-02-05, 330106-05-30-10-02-00, 330106-05-30-10-02-05.

## Ordering Information for Proximitor Sensor

### 3300 XL Proximitor Sensor

**330180-AA-BB**

| **A: Total Length and Mounting Option** | |
|---|---|
| **10** | 1.0 meter (3.3 feet) system length, panel mount |
| **11** | 1.0 meter (3.3 feet) system length, DIN mount |
| **12** | 1.0 meter (3.3 feet) system length, no mounting hardware |
| **50** | 5.0 meters (16.4 feet) system length, panel mount |
| **51** | 5.0 meters (16.4 feet) system length, DIN mount |
| **52** | 5.0 meters (16.4 feet) system length, no mounting hardware |
| **90** | 9.0 meters (29.5 feet) system length, panel mount |
| **91** | 9.0 meters (29.5 feet) system length, DIN mount |
| **92** | 9.0 meters (29.5 feet) system length, no mounting hardware |
| **B: Agency Approval Option** | |
| **00** | Not required |
| **05** | CSA, ATEX, IECEx Approvals |

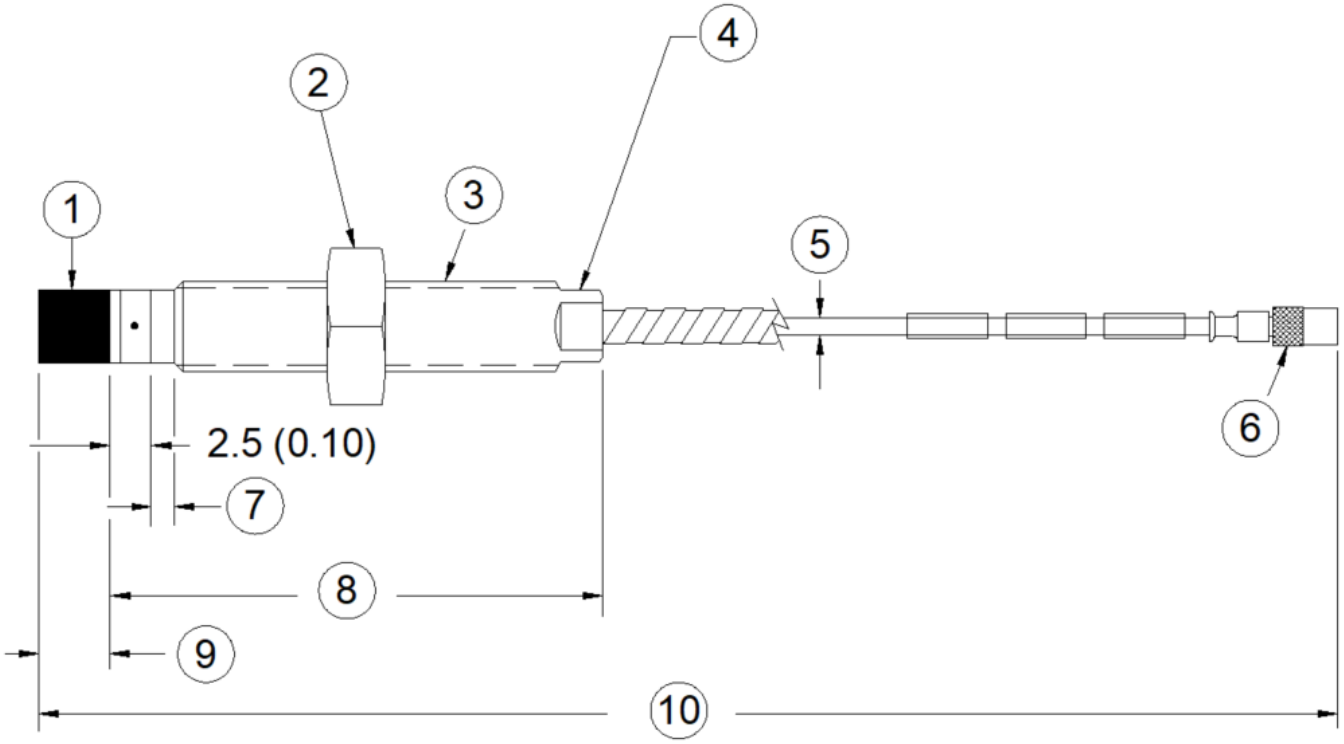
## Ordering Information for Extension Cables

### 3300 XL Standard Extension Cable

**330130-AAA-BB-CC**

Make sure that the extension cable length and the probe length, when added together, equal the Proximitor Sensor total length.

| **A: Cable Length Option** | |
|---|---|
| **030** | 3.0 meters (9.8 feet) |
| **035** | 3.5 meters (13.1 feet) |
| **040** | 4.0 meters (11.5 feet) |
| **045** | 4.5 meters (14.8 feet) |
| **060** | 6.0 meters (19.7 feet) |
| **070** | 7.0 meters (22.9 feet) |
| **075** | 7.5 meters (24.6 feet) |
| **080** | 8.0 meters (26.2 feet) |
| **085** | 8.5 meters (27.9 feet) |
| **B: Connector Protector and Cable Option** | |
| **00** | Standard cable |
| **01** | Armored cable |
| **02** | Standard cable with connector protector |




1. Probe tip, 8.0 mm (0.31 in) diameter
2. 9/16 in for 3/8-24 threads, M17 for M10 threads (see Note 2)
3. Case thread
4. 5/16 in wrench flats for 3/8-24 threads; 8mm wrench flats for M10 threads.
5. 75 Ω cable, 3.68 mm (0.145 in) maximum outside diameter, 3.94 mm (0.155 in) maximum outside diameter for FluidLoc cable, 7.67 mm (0.302 in) outside diameter of armor, 9.5 mm (0.38 in) maximum diameter of armor ferrule
6. Miniature male coaxial connector, 7.24 mm (0.285 in) maximum outside diameter “D”
7. Unthreaded length “A”
8. Case length “B”
9. 6.0 mm (0.235 in) maximum
10. Total length “C”, +30%, -0%[3]

**Figure 14: 3300 XL 8 mm Proximity Probes, Standard Mount**

330101 and 330191, 3/8-24 UNF-2A, without armor [7]

330102 and 330192, 3/8-24 UNF-2A, with armor [6]

330103 and 330193, M10X1 thread, without armor [7]

330104 and 330194, M10X1 thread, with armor [6]