

Official Product Identity Mapping

330102-16-40-50-01-05

Official Baker Hughes ordering identity: 330102-16-40-50-01-05

330102 = 3300 XL 8 mm probe, 3/8-24 UNF thread, with armor

16 = 1.6 in unthreaded length; 40 = 4.0 in overall case length

50 = 5.0 m total length; 01 = standard cable with ClickLoc connector protector

05 = CSA, ATEX and IECEx approvals

The following official 141194 pages define this order code and applicable probe data.

Official model page:

<https://dam.bakerhughes.com/m/23d2a1de24360b13/original/3300-XL-8mm-Proximity-Transducer-System-Datasheet-141194-pdf.pdf>

3300 XL 8 mm Proximity Transducer System

Datasheet

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Description

The 3300 XL 8 mm Proximity Transducer System consists of:

- One 3300 XL 8 mm probe,
- One 3300 XL extension cable¹, and
- One 3300 XL Proximitors Sensor².

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 measurements³.

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 Proximitors sensors, eliminating the need to match or bench calibrate individual components.

Each 3300 XL 8 mm Transducer System component is backward compatible and interchangeable⁴ with other non-XL 3300 series 5 mm and 8 mm transducer system components⁵. 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 

3300 XL 8 mm Proximity Transducer System
Datasheet

141194 Rev. AM

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 Proximity 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.

3300 XL 8 mm Proximity Transducer System Datasheet

141194 Rev. AM

Specifications

Unless otherwise noted, the following specifications are for a 3300 XL 8 mm Proximity 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 k Ω 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

Proximity 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)	$R_{\text{PROBE}}(\Omega)$
0.5	7.45 $\pm$ 0.50
1.0	7.59 $\pm$ 0.50
1.5	7.73 $\pm$ 0.50
2.0	7.88 $\pm$ 0.50
3.0	8.17 $\pm$ 0.50
5.0	8.73 $\pm$ 0.50
9.0	9.87 $\pm$ 0.50

Nominal Extension Cable DC Resistance

Resistance (R_{CORE}) from Center Conductor to Center Conductor

Length of Extension Cable (m)	$R_{\text{CORE}}(\Omega)$
3.0	0.66 $\pm$ 0.10
3.5	0.77 $\pm$ 0.12
4.0	0.88 $\pm$ 0.13
4.5	0.99 $\pm$ 0.15
6.0	1.32 $\pm$ 0.21
7.0	1.54 $\pm$ 0.23
7.5	1.65 $\pm$ 0.25
8.0	1.76 $\pm$ 0.26
8.5	1.87 $\pm$ 0.28

3300 XL 8 mm Proximity Transducer System
Datasheet

141194 Rev. AM

Resistance (R_{JACKET}) from Outer Conductor to Outer Conductor	
Length of Extension Cable (m)	R_{JACKET} (Ω)
3.0	0.20 ± 0.04
3.5	0.23 ± 0.05
4.0	0.26 ± 0.05
4.5	0.30 ± 0.06
6.0	0.39 ± 0.08
7.0	0.46 ± 0.09
7.5	0.49 ± 0.10
8.0	0.53 ± 0.11
8.5	0.56 ± 0.11

Extension Cable Capacitance	69.9 pF/m (21.3 pF/ft) typical
Field Wiring	0.2 to 1.5 mm ² (16 to 24 AWG). Recommend using 3 conductor shielded triad cable and tinned field wiring. Maximum length of 305 meters (1,000 feet) between the 3300 XL Proximity Sensor and the monitor. See the frequency response graphs, Figures 10 and 12, for signal rolloff at high frequencies when using longer field wiring lengths.
Linear Range	2 mm (80 mils). Linear range begins at approximately 0.25 mm (10 mils) from target and is from 0.25 to 2.3 mm (10 to 90 mils) (approximately -1 to -17 Vdc).

Recommended Gap Setting for Radial Vibration	-9 Vdc [approximately 1.27 mm (50 mils)]
Incremental Scale Factor (ISF)	
Standard 5 or 1 meter System	7.87 V/mm (200 mV/mil) $\pm$ 5% including interchangeability error when measured in increments of 0.25 mm (10 mils) over the 80 mil linear range from 0°C to +45°C (+32°F to +113°F).
Standard 9 meter System	7.87 V/mm (200 mV/mil) $\pm$ 6.5% including interchangeability error when measured in increments of 0.25 mm (10 mils) over the 80 mil linear range from 0°C to +45°C (+32°F to +113°F).
Extended Temperature Range (ETR) for 5 and 9 Meter Systems	7.87 V/mm (200 mV/mil) $\pm$ 6.5% including interchangeability error when measured in increments of 0.25 mm (10 mils) over the 80 mil linear range from 0°C to +45°C (+32°F to +113°F).
Deviation from best fit straight line (DSL)	
Standard 5 or 1 meter System	Less than ± 0.025 mm (± 1 mil) with components at 0°C to +45°C (+32°F to +113°F).
Standard 9 meter System	Less than ± 0.038 mm (± 1.5 mil) with components at 0°C to +45°C (+32°F to +113°F).
Extended Temperature Range 5 and 9 meter Systems	Less than ± 0.038 mm (± 1.5 mil) with components at 0°C to +45°C (+32°F to +113°F).

3300 XL 8 mm Proximity Transducer System
Datasheet

141194 Rev. AM

Performance over Extended Temperatures

Standard 5 or 1 meter System	Over a probe temperature range of -35°C to $+120^{\circ}\text{C}$ (-31°F to $+248^{\circ}\text{F}$) with the Proximitor sensor and extension cable between 0°C to $+45^{\circ}\text{C}$ ($+32^{\circ}\text{F}$ to $+113^{\circ}\text{F}$), the ISF remains within $\pm 10\%$ of 7.87 V/mm (200 mV/mil) and the DSL remains within $\pm 0.076\text{ mm}$ ($\pm 3\text{ mils}$).
	Over a Proximitor sensor and extension cable temperature range of -35°C to $+65^{\circ}\text{C}$ (-31°F to $+149^{\circ}\text{F}$) with the probe between 0°C to $+45^{\circ}\text{C}$ ($+32^{\circ}\text{F}$ to $+113^{\circ}\text{F}$), the ISF remains within $\pm 10\%$ of 7.87 V/mm (200 mV/mil) and the DSL remains within $\pm 0.076\text{ mm}$ ($\pm 3\text{ mils}$).
Standard 9 meter System	Over a probe temperature range of -35°C to $+120^{\circ}\text{C}$ (-31°F to $+248^{\circ}\text{F}$) with the Proximitor sensor and extension cable between 0°C to $+45^{\circ}\text{C}$ ($+32^{\circ}\text{F}$ to $+113^{\circ}\text{F}$), the ISF remains within $\pm 18\%$ of 7.87 V/mm (200 mV/mil) and the DSL remains within $\pm 0.152\text{ mm}$ ($\pm 6\text{ mils}$).
	Over a Proximitor sensor and extension cable temperature range of -35°C to $+65^{\circ}\text{C}$ (-31°F to $+149^{\circ}\text{F}$) with the probe between 0°C to $+45^{\circ}\text{C}$ ($+32^{\circ}\text{F}$ to $+113^{\circ}\text{F}$), the ISF remains within $\pm 18\%$ of 7.87 V/mm (200 mV/mil) and the DSL remains within $\pm 0.152\text{ mm}$ ($\pm 6\text{ mils}$).

Extended Temperature Range 5 and 9 meter Systems

Over a probe and extension cable temperature range of -35°C to $+260^{\circ}\text{C}$ (-31°F to $+500^{\circ}\text{F}$) with the Proximitor sensor between 0°C to $+45^{\circ}\text{C}$ ($+32^{\circ}\text{F}$ to $+113^{\circ}\text{F}$), the ISF remains within $\pm 18\%$ of 7.87 V/mm (200 mV/mil) and the DSL remains within $\pm 0.152\text{ mm}$ ($\pm 6\text{ mils}$).

Frequency Response

(0 to 10 kHz), +0, -3 dB, with up to 305 meters (1000 feet) of field wiring.

Minimum Target Size

15.2 mm (0.6 in) diameter (flat target)

Shaft Diameter

Minimum

50.8 mm (2 in)

Recommended Minimum

76.2 mm (3 in)



When gapped at the center of the linear range, the interaction between two separate transducer systems (cross-talk) will be less than 50 mV on shaft diameters of at least 50 mm (2 in) or greater. You should take care to maintain minimum separation of transducer tips, generally at least 40 mm (1.6 in) for axial position measurements or 38 mm (1.5 in) for radial vibration measurements to limit cross-talk to 50 mV or less. Radial vibration or position measurements on shaft diameters smaller than 76.2 mm (3 in) will generally change the scale factor.

3300 XL 8 mm Proximity Transducer System
Datasheet

141194 Rev. AM

Effects of 60 Hz Magnetic Fields Up to 300 Gauss

Output Voltage in Mil pp/Gauss

Gap	5 or 1-meter Proximity Sensor	9 meter Proximity Sensor	Probe	Ext. Cable
10	0.0119	0.0247	0.0004	0.0004
50	0.0131	0.0323	0.0014	0.0014
90	0.0133	0.0348	0.0045	0.0045

Mechanical

Probe Tip Material	Polyphenylene sulfide (PPS).
Probe Case Material	AISI 303 or 304 stainless steel (SST).

Probe Cable Specifications

Standard cable	75Ω triaxial, fluoroethylene propylene (FEP) insulated probe cable in the following total probe lengths: 0.5, 1, 1.5, 2, 3, 5, or 9 meters.
Extended Temperature Range cable	75Ω triaxial, perfluoroalkoxy (PFA) insulated probe cable in the following total probe lengths: 0.5, 1, 1.5, 2, 5, or 9 meters.
Armor (optional on both)	Flexible AISI 302 or 304 SST with FEP outer jacket.
Tensile Strength (Maximum Rated)	330 N (75 lbf) probe case to probe lead. 270 N (60 lbf) at probe lead to extension cable connectors.

Connector Material

Gold-plated brass or gold-plated beryllium copper.

Probe Case Torque

Probe Type	Maximum Rated	Recommended
Standard forward mounted probes	33.9 N•m (300 in•lbf)	11.2 N•m (100 in•lbf)
Standard forward-mount probes - first three threads	22.6 N•m (200 in•lbf)	7.5 N•m (66 in•lbf)
Reverse-mount probes	22.6 N•m (200 in•lbf)	7.5 N•m (66 in•lbf)

Extension Cable Material

Standard cable	75 Q triaxial, fluoroethylene propylene (FEP) insulated
Extended Temperature Range cable	75Ω triaxial, perfluoroalkoxy (PFA) insulated.
Minimum Cable Bend Radius	25.4 mm (1.0 in)



3300 XL 8 mm components are both electrically and physically interchangeable with non-XL 3300 5 mm and 8 mm components when minimum permissible cable bend radius is observed.

Connector Material

Gold-plated brass or gold-plated beryllium copper.

Maximum Connector Torque

0.565 N•m (5 in•lbf)

3300 XL 8 mm Proximity Transducer System
Datasheet

141194 Rev. AM

Connector-to-Connector Recommended Torque

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

Materials

Proximator Sensor Material	A308 aluminum
Connector Material	Gold-plated brass or gold-plated beryllium copper.

Length

System Length	5 or 9 meters (including extension cable) or 1 meter (probe only).
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Weight

Total System Weight (Typical)	0.7 kg (1.5 lb m)
Probe	323 g/m (11.4 oz)
Extension Cable	34 g/m (0.4 oz/ft)
Armored Extension Cable	103 g/m (1.5 oz/ft)
Proximator Sensor	246 g (8.67 oz)

Thread Engagement Limits

Probe Case Thread	Maximum Length of Thread Engagement
3/8-24	0.563 in
M10x1	15 mm



Maximum thread engagement lengths are per the industry standard of 1.5 times the nominal thread diameter. A fit class matching that of the external probe thread is assumed for all internal threads. Applications with thread engagement lengths exceeding the values in the table above may exhibit binding during installation. Contact your Bently Nevada representative if you require probe thread engagement lengths exceeding the values above. Bently Nevada does not replace proximity probes under warranty due to excessive thread engagement lengths.

3300 XL 8 mm Proximity Transducer System Datasheet

141194 Rev. AM

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.

Length configurations:

Maximum unthreaded length: 8.8 in.

Minimum unthreaded length: 0.0 in.

Example: **0 4** = 0.4 in.

B: Overall Case Length Option

Order in increments of 0.1 in.

Standard thread configurations:

Maximum case length: 9.6 in.

Minimum case length: 0.8 in.

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)

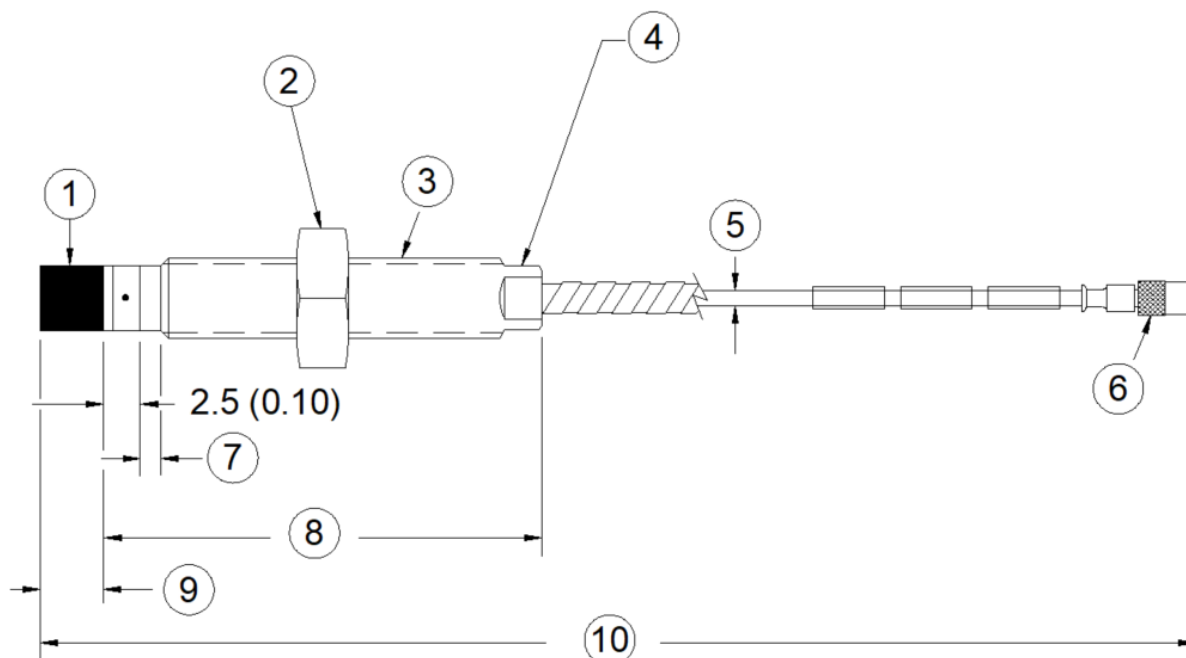
330104 3300 XL 8 mm Probe, M10 x 1 thread, with armor (2)

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

A: Unthreaded Length Option

3300 XL 8 mm Proximity Transducer System
Datasheet

141194 Rev. AM



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



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