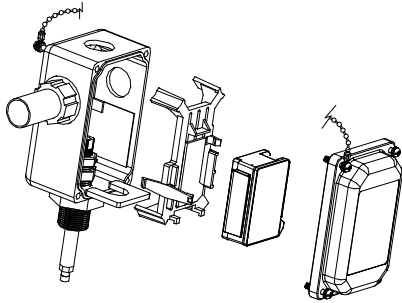


PROXPAC XL Proximity Transducer Assembly

Bently Nevada* Asset Condition Monitoring



Description

The design of the PROXPAC XL* Proximity Transducer Assembly is similar to our 31000/32000 Proximity Probe Housing Assemblies. The assembly offers the same advantages and features as the 31000 and 32000 housings for accessing and externally adjusting proximity probes. However, the housing cover of the PROXPAC XL Assembly also contains its own 3300 XL Proximitor* sensor. This design makes the PROXPAC XL Assembly a completely self-contained proximity probe system, and eliminates the need for an extension cable between the probe and its associated Proximitor sensor. It also eliminates the need for a separate Proximitor housing, as the field wiring connects directly between the monitors and PROXPAC XL Assemblies.

The PROXPAC XL housing is made of Polyphenylene Sulfide (PPS), which is an advanced, molded thermoplastic. This material replaces the steel and aluminum in previous housings offered in the Bently Nevada* product line. It also incorporates glass and conductive fibers in the PPS to strengthen the housing and more effectively dissipate electrostatic charges. The PROXPAC XL housing is rated for Type 4X and for IP66 environments and provides extra protection in severe environments.

Specifications

Electrical

Proximitorsensor Input

3300 XL 8 mm Proximity Probe with a 1-metre cable length installed in the probe sleeve.

Power

Requires -17.5 Vdc to -26 Vdc without barriers 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 (R_{PROBE}):

See Table 1.

Table 1: Resistance from the Center Conductor to the Outer Conductor

Probe Length (m)	R_{PROBE} (Ω)
1.0	7.59 ± 0.50

Field wiring:

0.2 to 1.5 mm² (16 to 24 AWG). Recommend using 3-conductor shielded triax cable and tinned field wiring. Maximum length of 305 metres (1,000 feet) between the 3300 XL Proximitorsensor and the monitor. See the frequency response graph (Figure 1, page 7) 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 mm to 2.3 mm (10 mils to 90 mils) (approximately -1 Vdc to -17 Vdc).

Recommended Gap Setting:

1.27 mm (50 mils)

Incremental Scale Factor (ISF)

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).

Deviation from best fit straight line (DSL)

Standard 1 metre system

Less than $\pm 0.025\text{mm}$ (± 1 mil) with components at 0 °C to +45 °C (+32 °F to +113 °F).

Frequency Response

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

Minimum Target Size

15.2 mm (0.6 in) diameter (flat target)

Shaft Diameter

Minimum

50.8 mm (2.0 in)

Recommended minimum

76.2 mm (3.0 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 (2.0 in) or greater. Care should be taken 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 (3.0 in) will generally result in a change in scale factor. Consult Performance Specification 159484 for additional information.

Effects of 60 Hz Magnetic Fields Up To 300 Gauss

See Table 2.

Table 2: Output Voltage in Mil pp/Gauss

Gap (mils)	1-metre Proximitior Sensor	Probe
10	0.0124	0.0004
50	0.0110	0.0014
90	0.0126	0.0045

Electrical Classification:

Complies with the European CE mark.

Hazardous Area Approvals


North America:


Ex ia IIC T4/T5; Class I Zone 0 or Class 1 Division 1; Groups A, B, C, and D, when installed with

intrinsically safe zener barriers per drawing 141092 or when installed with galvanic isolators. Certificate number 1109248 (LR 26744-222)

Ex nA IIC T4/T5 Class I Zone 2 or Class I, Division 2, Groups A, B, C, and D when installed without barriers per drawing 140979. T5 @ Ta = -35 °C to +85 °C. T4 @ Ta = -51 °C to +100 °C. Certificate number 1109248 (LR 26744-222)

Europe:

 II 1 G EEx ia IIC T4/T5. EC certificate number BAS99ATEX1101, when installed per drawing 141092.

 II 3 G EEx nAII T4/T5. EC certificate number BASEEFA 07 ATEX 0189 X, when installed per drawing 140979. T5 @ Ta = -35 °C to +85 °C. T4 @ Ta = -51 °C to +100 °C.

IEC Ex

3300 XL Proximitior Sensor, ia IECEx BAS04.0055X

Ex ia IIC T4 / T5 (-51°C ≤ Ta ≤ +100°C / -35°C ≤ Ta ≤ +85°C)

Terminal Block Connections

Ui = -28 V Ci = 0 nF
 li = 140 mA Li = 10 μH
 Pi = 0.84 W

Coaxial Connection

Ui = -28 V Ci = 5.7 nF
 li = 140 mA Li = 0.85 mH
 Pi = 0.84 W

Load Parameters

The capacitance and either the inductance or the inductance to resistance (L/R) ratio of the load connected to the probe coaxial

terminal, must not exceed the values in Table 3.

Table 3: Maximum Load Parameters

Group	Capacitance (µF)	Inductance (mH)	L/R Ratio (µH/Ω)
IIC	0.077	0.99	35
IIB	0.644	7.41	142
IIA	2.144	15.6	295

3300 XL
Proximitator
Sensor, nA

IECEX BAS04.0057X

AEx nA II T4 / T5 (-51 °C ≤ T_a ≤ +100 °C / -35 °C ≤ T_a ≤ +85 °C)

U_i = -28 V

3300 XL 8mm
Eddy Current
Probe, ia

IECEX BAS04.0056

AEx ia IIC Temperature
Classification per Table 4 below.

Table 4: Aex ia IIC Temperature Classifications

Temperature Classification	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

U_i = -28 V C_i = 1.5 nF
I_i = 140 mA L_i = 200 µH
P_i = 0.84 W

3300 XL 8mm
Eddy Current
Probe, nA

IECEX BAS04.0058X

Ex nA II Temperature
Classification per the table above.

Must be supplied from a voltage
limited source.

EEx nA for Zone 2, Group IIC, EC
certificate number
BAS99ATEX3100U.

Brazil:

3300 XL 8mm
Eddy Current
Probe,

Br-EX ia IIC

MC, AEX-8102

3300 XL
Proximitator
Sensor,

Br-EX ia IIC

MC, AEX-8294

Mechanical

Housing Ratings

IP66 rating verified by BASEEFA
report number T07/0709.

**Probe Tip
Material**

Polyphenylene Sulfide (PPS)

**Probe Case
Material**

AISI 304 stainless steel

Probe Cable

1-metre length, 75 Ω triaxial,
fluoroethylene propylene (FEP)
insulated.

**Probe
Connector**

Gold-plated brass ClickLoc*
connector.

Probe Tensile Strength
330 N (75 lb) between probe cable and case, maximum.

Housing Material
Ultraviolet (UV) resistant, glass-reinforced polyphenylene sulfide (PPS) thermoplastic containing conductive fibers.

Sleeve Material and Retaining Chain
AISI 304 stainless steel

Outer Sleeve and Retaining Screws
AISI 303 stainless steel

Sleeve O-Ring Material
Neoprene

Grounding Liner and Retaining Plate Material
AISI 304 Stainless Steel

Vibration Isolation Material
Extra Soft Cellular Silicone

Lid Label Material
Gloss Radiant White Polyester

Recommended Torque Retaining Nut
29.5 N·m (260 in·lb)

Probe Sleeve Locknut
39.3 N·m (350 in·lb)

Housing Strength Typical
Outer sleeve was mounted on a test stand with its axis parallel to horizontal and the housing mounted on the outer sleeve through an end hole. The housing supported 912 N (205 lbf) placed approximately 38 mm (1.5 in) from the unsupported end with the cover fastened in place and grounding liner installed.

Housing Impact Strength
Certified by BASEEFA to withstand two separate 4 Joule (5.4 ft·lb) impacts at -39°C (-38°F) and at 115°C (239°F). CSA verified that samples of the housing and cover could withstand a 7 Joule (9.5 ft·lb) impact at ambient room temperature.

Total System Weight
1.44 kg (3.2 lbm) typical with 0.3 metre (12 in) sleeve length.

Environmental Limits

Probe Temperature Range

Operating Temperature:

-51 °C to +177 °C (-60 °F to +350 °F).

Note: Exposing the probe to temperatures below -34 °C (-29 °F) may cause premature failure of the pressure seal.

Probe Housing and Proximity Sensor

Operating Temperature:

-51 °C to +100 °C (-60 °F to +212 °F).

Proxpac Storage Temperature:

-51 °C to +105 °C (-60 °F to +221 °F).

Relative Humidity (PROXPAC XL Sensor and probe):

100% condensing, non-submersible when connectors are protected. When properly sealed, moisture should not enter the housing. Users should take precautions to prevent moisture from traveling through the conduit into the housing.

Hot Water and Steam Exposure Effects:

(Specification not guaranteed) Brief periods (up to one week) of contact with hot water 95 °C (203 °F) and/or condensing steam should not significantly affect the strength of the plastic housing. Longer contact with hot water or steam may weaken the plastic housing during the first 6 to 8 weeks of exposure and ultimately reduce the housing strength to approximately half of the initial value. Tests of actual housing performance after contact with hot water and condensing steam have not been conducted.

Probe Pressure:

The PROXPAC XL design seals differential pressure between the

probe tip and the housing main body when used with a 3300 XL 8 mm probe. The sealing material inside the probe case consists of a Viton O-ring, whereas the O-ring between the sleeve and the housing is Neoprene. The plastic housing design is certified to seal against hose-directed water according to Type 4X and IP66 standards but will not resist internal or external pressure. Probes are not pressure tested prior to shipment.

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 their installation will contain and safely control all liquids and gases should the PROXPAC XL transducer leak. Solutions with high or low pH values may erode the tip assembly of the probe, causing media to leak into surrounding areas. Bently Nevada LLC will not be held responsible for any damages resulting from leaking Proximity Probe Housing Assemblies. In addition, PROXPAC XL transducers will not be replaced under the service plan due to probe leakage.

Patents

One or more of the following patents apply to this product: 5,016,343; 5,126,664; 5,351,388; and 5,685,884

Frequency Response with Different Field Wiring Lengths without Barriers (1 m System)

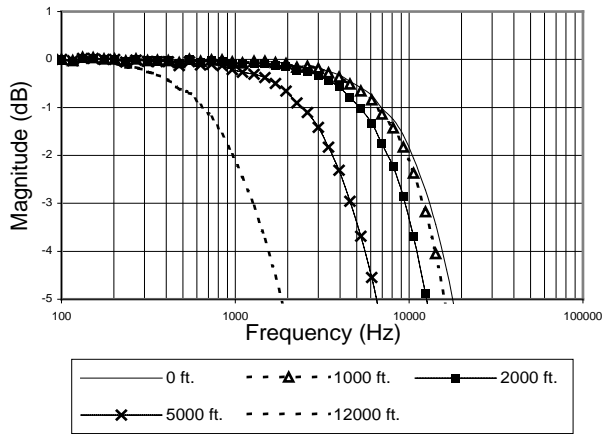


Figure 1

Ordering Information

Notes:

Order **-00** or **-01** (for multi approvals) for the **A** option and **-00** or **-000** for all other options to receive just a spare housing with Proximitor Sensor.

PROXPAC XL Proximity Transducer, English

330880-AXX-BXX-CXXX-DXX-EXX

A: Probe and Approvals Option

- 00** No probe; Proximitor Sensor without approvals
- 01** No probe; Proximitor sensor with Multiple Approvals
- 16** 3300 XL 8 mm probe without approvals
- 28** 3300 XL 8 mm probe with Multiple Approvals

B: Standoff Adapter Option (B Dimension)

Order in increments of 0.5 in (13 mm).

Minimum length: 1.5 in (38 mm)

Maximum length: 7.5 in (191 mm)

Examples:

00 = No standoff adapter

15 = 1.5 in (38 mm)

C: Probe Penetration Option (C Dimension)

For penetration lengths between 1.0 and 2.0 inches, counterbore may be required in machine case to reduce probe side view and/or rear view effects.

Order in increments of 0.1 in (2 mm).

Minimum length: 1.0 in (25 mm)

Maximum length: 30 in (762 mm)

Examples:

000 = No probe sleeve

037 = 3.7 in (94 mm)

224 = 22.4 in (569 mm)

D: Fittings Option

For 1/2-14 NPT fittings, order option -03 or spare 26650-01 reducers for either option -01 or -02.

- 00** No fittings; two plugs and two washers
- 01** One 3/4-14 NPT fitting, two plugs
- 02** Two 3/4-14 NPT fittings, one plug
- 03** One 3/4-14 NPT fitting, one 3/4-14 NPT to 1/2-14 NPT SST reducer and two plugs

E: Mounting Thread Option

- 00** No outer sleeve assembly
- 02** 3/4-14 NPT (Required if ordering Standoff Adapter Option.)
- 05** 7/8-14 UNF-2A

PROXPAC XL Proximity Transducer, Metric

330881-AXX-BXX-CXXX-DXX-EXX

A: Probe and Approvals Option

- 00** No probe; Proximitor sensor without approvals
- 01** No probe; Proximitor sensor with Multiple Approvals
- 16** 3300 XL 8 mm probe without approvals
- 28** 3300 XL 8 mm probe with Multiple Approvals

- B: Standoff Adapter Option (B Dimension)**
 Order in increments of 10 mm.
Minimum length: 40 mm
Maximum length: 200 mm
Examples:
0 0 = No standoff adapter
0 4 = 40 mm
2 0 = 200 mm

- C: Probe Penetration Option (C Dimension)**
-
- For penetration lengths between 25 and 50 mm, counter bore may be required in machine case to reduce probe side view and/or rear view effects.
-
- Order in increments of 1 mm.
Minimum length: 25 mm
Maximum length: 760 mm
Examples:
0 0 0 = No probe sleeve
0 5 0 = 50 mm
7 6 0 = 760 mm

- D: Fittings Option (supplied as a kit)**
- 0 0** No fittings; two plugs and two washers
 - 0 1** One M25 fitting, two plugs
 - 0 2** Two M25 fittings, one plug
 - 0 3** One M20 fitting, two plugs
 - 0 5** One PG21 to PG11 reducer, two plugs
 - 0 6** One 3/4-14 NPT fitting, one 3/4-14 NPT to 1/2-14 NPT SST reducer and two plugs
 - 0 7** One PG21 x M20 fitting, two plugs
 - 0 8** Two PG21 x M20 fittings, one plug

Conduit fittings are necessary when hardline conduit or metal piping is brought into the housing. If using flexible conduit, you should order with integral 3/4-14 NPT fittings so that you do not require additional conduit fittings with the housing. If using flexible conduit, order the D = 0 0 option.

- E: Mounting Thread Option**
- 0 0** No outer sleeve assembly
 - 0 1** M24 X 3
 - 0 2** 3/4-14 NPT (required if ordering Standoff Adapter Option)

Accessories

- 159484** Performance Specification - 3300 XL Proximity Transducer System
- 178761-01** Operation manual
- 178850-00** Upgrade Kit, Non-approved (Includes housing lid, 1-metre Proximator sensor, and support table)
- 178850-05** Upgrade Kit, Multi-Approvals (Includes housing lid, 1-metre Proximator sensor, and support table)
- 178644-01** Proximator sensor support table
- 330180-12-00** Spare 3300 XL Proximator sensor, non-approved
- 330180-12-05** Spare 3300 XL Proximator sensor, Multiple Approvals
- 330105-02-12-10-02-00** Spare 3300 XL 8 mm probe, English, non-approved
- 330105-02-12-10-02-05** Spare 3300 XL 8 mm probe, English, approved
- 330106-05-30-10-02-00** Spare 3300 XL 8 mm probe, metric, non-approved
- 330106-05-30-10-02-05** Spare 3300 XL 8 mm probe, metric, approved
- 02120015**
- Bulk Field Wire**
 1.0 mm² (18 AWG), 3-conductor, twisted shielded cable with drain wire. Specify length in feet.

37948-01

Probe Support / Oil Sleeve

Provides seal along probe sleeve.
May be used as a probe sleeve support in certain installations.

English Probe Sleeve (Spare)

108883 -AXXX

This is the measured probe sleeve length. Order in increments of 0.1 in (3 mm). Note that the individual probe sleeve length **does not** include the distance from the end of the sleeve to the probe tip or the gap from the probe tip to the target material. If only the part number of the original housing is known and the sleeve cannot be measured, use the following formula to determine the sleeve length:

- A: Standoff Adapter Option from original housing (330800 option B) + Probe penetration option from original housing (330800 option C) + 025.

Example: Original part number is 330800-16-15-035-03-02. A option for replacement sleeve is (015 + 035 + 025) = **0 7 5**.

Minimum Probe Sleeve Length:

3.5 in (89 mm) = **0 3 5**

Maximum Probe Sleeve Length:

32.5 in (826 mm) = **3 2 5**

Metric Probe Sleeve (Spare)

108882 -AXXX

This is the measured probe sleeve length. Order in increments of 1 mm. Note that the individual probe sleeve length **does not** include the distance from the end of the sleeve to the probe tip or the gap from the probe tip to the target material. If only the part number of the original housing is known and the sleeve cannot be measured, use the following formula to determine the sleeve length:

- A Standoff Adapter Option from original housing (330801 option B) * 10 + Probe penetration option from original housing (330801 option C) + 063.

Example: Original part number is 330801-16-08-205-03-02. A option for replacement sleeve is (080 + 205 + 063) = **3 4 8**.

Minimum Probe Sleeve Length:

88 mm (3.5 in) = **0 8 8**

Maximum Probe Sleeve Length:

823 mm (32.4 in) = **8 2 3**

English Standoff Adapter (Spare)

Hex = 1-3/8 in; threads = 3/4-14 NPT

109319 -AXXX

Order in increments of 0.5 in (13 mm).

Minimum length: 1.5 in (38 mm)

Maximum length: 7.5 in (191mm)

Example: 0 2 0 = 2 in (51 mm)

Metric Standoff Adapter (Spare)

Wrench flats = 35 mm; threads = 3/4-14 NPT.

109318 -AXX

Order in increments of 10 mm.

Minimum length: 40 mm

Maximum length: 200 mm

Example: 0 5 = 50 mm

104968-01

English sleeve plug threaded, 303 stainless steel.

104968-02

Metric Sleeve Plug Threaded, 303 stainless steel.

Plugs fill opening when sleeve is removed from machine case.

104288-01

English Blanking Plug

104288-02

Metric Blanking Plug.

Blanking plugs are included with the Fittings Option "D". Spare plugs fill conduit holes in plastic housing where needed.

Heavy Duty Cable Fittings

03813103

Chrome-plated zinc conduit fitting, 3/4-14 NPT

03818100

AISI 316 stainless steel conduit fitting, 3/4-14 NPT

03818101

AISI 316 stainless steel conduit fitting, PG21 x M25

03818102

AISI 316 stainless steel conduit fitting, PG21 x M20

03818111

Nickel-plated brass conduit fitting, PG21 x M20

26650-01

AISI 303 stainless steel reducer 3/4-14 NPT to 1/2-14 NPT

Sealtite Flexible Conduit

14847-AXX

1/2-14 NPT assembly

14848-AXX

3/4-14 NPT assembly

A: Length Option

Order in increments of 1 ft (0.3 m).

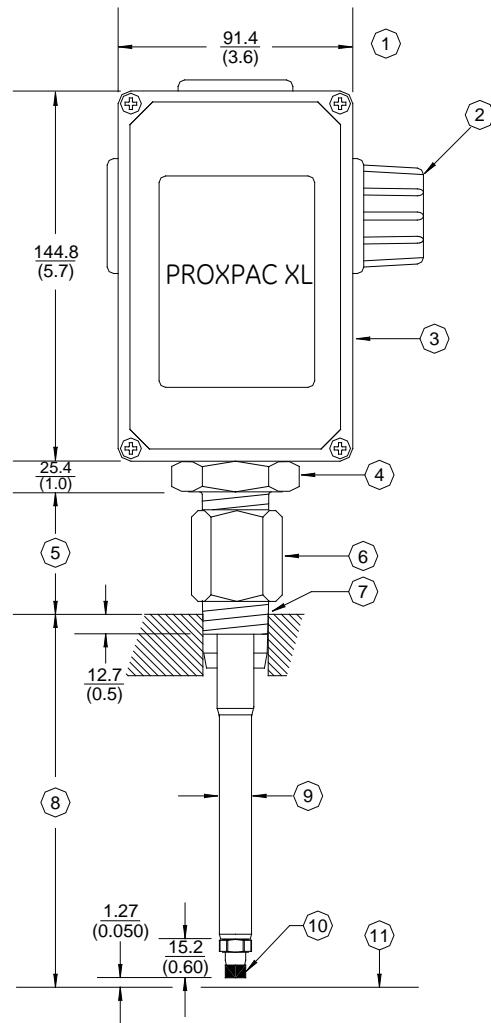
Minimum length: 1 ft (0.3 m).

Maximum length: 99 ft (30.2 m)

Example: 0 5 = 5 ft (1.5 m)

Figures and Drawings

Note: All dimensions in millimeters (inches) except as noted.



1. Depth = 92.7 (3.65)
2. Fitting "D"
3. PROXPAC XL Housing
4. 42 (1.75) hexagonal
5. Dimension "B"
6. Standoff adaptor (optional)
7. 3/4-14 NPT
8. Dimension "C"
9. 12.7 (0.5) diameter stainless steel sleeve
10. Probe
11. Target surface

Figure 1: Dimensions for PROXPAC XL Proximity Transducer Assembly

Figure information

- "B" plus "C" dimensions greater than 305 mm (12.0 in) require additional sleeve support near the probe to stiffen the assembly and avoid the influence of resonance.
- For desired probe penetration lengths of less than 51 mm (2.0 in), order a separate Individual Standoff Adapter. The effective probe penetration length will then be reduced by the length of the Individual Standoff Adapter, plus an additional 13 mm (0.5 in) due to the NPT thread engagement.

Example: The customer desires a probe penetration length of 25 mm (1.0 in). To do this, they order a 330800 housing with CXXX (probe penetration) option of 0 3 0 [76 mm (3 in)] and a separate individual standoff adapter that is 38 mm (1.5 in) in length (part number 109319-015). The standoff adapter would cover 38 mm (1.5 in) of the probe sleeve, plus an additional 13 mm (0.5 in). Therefore, the effective probe penetration length would drop to 25 mm (1.0 in).

- "B" plus "C" dimension represents mid-setting distance between mounting surface and target surface. Threaded sleeve allows ± 12.7 mm (0.5 in) adjustment from this point. "B" plus "C" dimension is 760 mm (30 in) maximum.

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