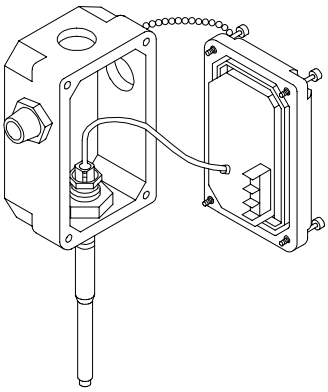
# PROXPAC Proximity Transducer Assembly

Patents: 5,016,343; 5,126,664; 5,351,388; 5,685,884



## Description

The PROXPAC® Proximity Transducer Assembly is similar in external appearance and mounting detail to our 31000/32000 Proximity Probe Housing Assemblies. It offers the same advantages and features as these conventional housings for external adjustment of, and access to, proximity probes. However, the PROXPAC® Assembly also contains its own Proximitor® Sensor inside the housing's cover. This design makes the PROXPAC® 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. For short cable runs, field wiring is connected directly between the monitors and PROXPAC® Assemblies. For longer cable runs, a junction box is often mounted at or near the machine skid to house terminal strips. The field wiring is connected to terminal strips in the junction box, providing access to Proximitor® signals at a convenient location near the machine.

The PROXPAC® housing is made of Polyphenylene Sulfide (PPS) which is an advanced, molded thermoplastic. It was chosen specifically to replace previous steel and aluminum housings offered by Bently Nevada, and incorporates glass and conductive fibers in the PPS for added strength and electrostatic dissipation. The PROXPAC® housing is rated for Type 4X and for IP66 environments for extra protection in severe environments.

## Specifications

Unless otherwise noted, the following specifications apply from +18°C to +27°C (+64°F to +80°F) with a -24 Vdc power supply, a 10 kΩ load, a Bently Nevada supplied AISI 4140 steel target and a probe gapped at 1.27 mm (50 mils).

### Electrical

**Input:**

Accepts one noncontacting 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. Operating at a more positive voltage than -23.5 Vdc may 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

**Probe dc resistance (nominal) ($R_{PROBE}$):**

7.58 ± 0.5 Ω

**Field Wiring:**

Recommend using three-conductor twisted shielded cable. Maximum length of 305 metres (1,000 feet) between the PROXPAC® Sensor and the monitor. See the frequency response graph (Figure 1) for signal rolloff at high frequencies when using longer field wiring lengths.

**Linear Range:**

2.0 mm (80 mils). Linear range begins at approximately 0.25 mm (10 mils) from the target and is from 0.25 mm to 2.3 mm (10 to 90 mils) (approximately -1 to -17 Vdc).

**Recommended Gap Setting:**

1.27 mm (50 mils).

**Incremental Scale Factor (ISF):**

7.87 mV/µm (200 mV/mil) ±5.5% typical including interchangeability errors when measured in increments of 0.25 mm (10 mils) over the linear range.

**Deviation from best fit straight line (DSL):**

Less than ±23 µm (±0.9 mil) typical including interchangeability errors over the linear range when referenced to a 7.87 mV/µm (200 mV/mil) best fit straight line.

**Probe Temperature Stability:**

Over probe temperature range of -35°C to +120°C (-30°F to +250°F), typical Incremental Scale Factor (ISF) remains within ±10% of 7.87 mV/µm (200 mV/mil) while deviation from straight line remains within ±50µm (±2 mils).

**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). Measurements on shaft diameters smaller than 50 mm (2 in) usually require close spacing of radial vibration or axial position transducers with the potential for their electromagnetic emitted fields to interact with one another (cross-talk), resulting in erroneous readings. Care should be taken to maintain minimum separation of transducer tips, generally at least 40 mm (1.6 in) for axial position measurements or 74 mm (2.9 in) for radial vibration measurements. Radial vibration or position measurements on shaft diameters smaller than 76.2 mm (3 in) will generally result in a change in scale factor. Consult Performance Specification 158735 for additional information.

**Frequency Response:**

0 to 8 kHz: +0, -3 dB, at 50 mils probe gap with up to 305 metres (1000 feet) of field wiring. See Figure 1 below.

## Hazardous Area Approvals

**CSA/NRTL/C:**

Intrinsically safe for Class I, Division 1, Groups A, B, C and D, when installed per drawing 132484 or when installed with galvanic isolators. Class I, Division 2, Groups A, B, C and D non-incendive when installed per drawing 132484. Class II, Groups E, F, and G. Class III. Type 4X enclosure.
T6 @ -35°C≤Ta≤85°C,
T5 @ -35°C≤Ta≤100°C.

**ATEX**

ATEX II 1G, EEx ia IIC Intrinsically safe for Zones 0, and 1, Group IIC, LCIE certificate number 98 ATEX 6011X, when installed with intrinsically safe zener barriers or galvanic isolators per drawing 132484,
T6 @ -35°C≤Ta≤85°C,
T5 @ -35°C≤Ta≤100°C.

## Mechanical

**Housing Ratings:**

For North America, Type 4X water-proof and corrosion-resistant rating certified by Canadian Standards Association. IP66 rating verified by CSA report number SC 115582-1. CENELEC standard EN50014 rating for electrostatic dissipation of a plastic material located in a hazardous area.

**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 with connector protector attached.

**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

**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 lb) 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). Samples of the housing and cover were verified by CSA to withstand a 7 Joule (9.5 ft·lb) impact at ambient room temperature.

**Total System Weight:**

1.4 kg (3.1 lb) typical with 0.3 metre (12 in) sleeve length.

## Environmental Limits

**Probe Temperature Range**

*Operating and Storage Temperature:*

-51°C to +177°C (-60°F to +350°F).

**Note:** Exposing the probe to temperatures below -34°C (-30°F) may cause premature failure of the pressure seal.

**Probe Housing and Proximitor® Sensor**

*Operating Temperature:*

-34°C to +100°C (-30°F to +212°F).

*Storage Temperature:*

-34°C to +105°C (-30°F to +221°F).

**Relative Humidity (PROXPAC® Sensor and probe):**

100% condensing, non-submersible when connectors are protected. When properly sealed, moisture should not enter the housing. Precautions should be taken 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. Contact with these beyond this length of time may eventually cause the strength of the plastic housing to permanently decrease during the first 6 to 8 weeks of exposure, and then level at approximately half of its initial value. Tests of actual housing performance after contact with hot water and condensing steam have not been conducted.

**Probe Pressure:**

The PROXPAC® is designed to seal differential pressure between the probe tip and the housing main body when used with a 3300 XL 8 mm probe. The sealing material internal to the probe case consists of a Viton® O-ring; the O-ring between the sleeve and the housing is a Neoprene® O-ring. The plastic housing is certified to seal against hose-directed water according to Type 4X and IP66 standards but is not designed to 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 all liquids and gases are contained and safely controlled should leakage occur from the PROXPAC® transducer. Solutions with high or low pH values may erode the tip assembly of the probe, causing media leakage into surrounding areas. Bently Nevada Corporation will not be held responsible for any damages resulting from leaking Proximity Probe Housing Assemblies. In addition, PROXPAC® transducers will not be replaced under the service plan due to probe leakage.

**Effects of 60 Hz Magnetic Fields up to 420 Gauss:**

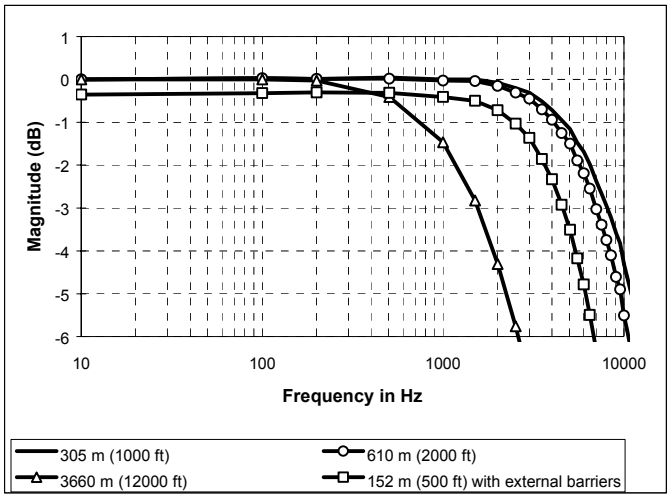
Output voltage in mil pp/gauss:

| Gap: | Proximitor® Sensor | Probe |
|---|---|---|
| 90 mil (worst case) | 0.0179 | 0.0045 |

**Patents**

5,016,343; 5,126,664; 5,351,388; and 5,685,884

Components or procedures described in the patents apply to this product




## Figure 1 Typical Frequency Response at 50 mils Gap

## Ordering Information

Notes:

Order -00 or -000 for all options to receive just a spare housing with Proximitor® Sensor.

When ordering probe separate from PROXPAC® Transducer, order a separate Connector Protector, Part Number 03839420 for the probe.

**PROXPAC® Proximity Transducer, English**

**330800-AXX-BXX-CXXX-DXX-EXX**

**Option Descriptions**

**A**: Probe and Approvals Option

**0 0** No probe; Proximitor® Sensor without approvals

**0 1** No probe; Proximitor® Sensor with Multiple Approvals

**1 6** 3300 XL 8 mm probe

**2 8** 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:**

**0 0** = No standoff adapter

**1 5** = 1.5 in (38 mm)

**C**: Probe Penetration Option (C Dimension)

For penetration lengths between 1.0 and 2.0 inches, counter bore 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:**

**0 0 0** = No probe sleeve

**0 3 7** = 3.7 in (94 mm)

**2 2 4** = 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.

**0 0** No fittings; two plugs and two washers

**0 1** One 3/4-14 NPT fitting, two plugs

**0 2** Two 3/4-14 NPT fittings, one plug

**0 3** 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

**0 0** No outer sleeve assembly

**0 2** 3/4-14 NPT (Required if ordering Standoff Adapter Option.)

**0 5** 7/8-14 UNF-2A

**PROXPAC® Proximity Transducer, Metric**

**330801-AXX-BXX-CXXX-DXX-EXX**

**Option Descriptions**

**A**: Probe and Approvals Option

**0 0** No probe; Proximitor® Sensor without approvals

**0 1** No probe; Proximitor® Sensor with Multiple Approvals

**1 6** 3300 XL 8 mm probe

**2 8** 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, it should be ordered with integral 3/4-14 NPT fittings so that additional conduit fittings are not required with the housing. If using flexible conduit, order the D = 00 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**

*02200068*

**Spare EMI Suppression Ferrite.** This snap-on ferrite part covers a portion of the field wiring inside the PROXPAC® Transducer housing. It reduces the effect of Electro-Magnetic Interference (EMI) on the transducer signal. The ferrite part is required for CE approved installations, primarily found in Europe.

*158735*

Performance Specification

*131236-01*

Operation Manual

*132306-01*

Spare Proximitor® Sensor and Housing Cover, non-approved

*132306-02*

Spare Proximitor® Sensor and Housing Cover, approved

*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

*132501-AXX*

**Field Wiring Cable**

1.0 mm² (18 AWG), 3 conductor, twisted, shielded cable. Terminal ring lugs are installed at each end including an extra shield ring lug at the monitor end.

**Option Description**

***A: Cable length option in feet.***

Order in increments of 1.0 ft (0.3 m).

**Minimum length:** 2 ft (0.6 m).

**Maximum length:** 99 ft (30 m).

**Examples:**

**1 5** = 15 feet (4.57 metres)

**2 0** = 20 feet (6.10 metres)

*103537-01*

**Terminal Mounting Block**

The block includes mounting screws and is easily installed in a Proximitor® Housing. The block accepts ring lugs used on the Field Wiring Cable.

*02120015*

**Bulk Field Wire**

1.0 mm² (18 AWG), 3-conductor, twisted shielded cable with drain wire. Specify length in feet.

*01651632*

**Terminal Ring Lug**

Extra ring lugs can be attached to Bulk Field Wire to assemble the exact length of cable needed.

*37948-01*

**Probe Support / Oil Sleeve**

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

*40113-02*

**Connector Protector Kit**

Installs a connector protector onto a probe that has been ordered separately.

**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:

**AXXX:** = Standoff Adapter Option from original housing (330800 option **B**) + Probe penetration option from original housing (330800 option **C**) + **0 2 5**. Example: original part number is 330800-16-15-035-03-02. **AXXX: option** for replacement sleeve is (015 + 035 + 025) = **075**.

**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:

**AXXX:** = Standoff Adapter Option from original housing (330801 option **B**) * **10** + Probe penetration option from original housing (330801 option **C**) + **0 6 3**. Example: original part number is 330801-16-08-205-03-02. **AXXX:** option for replacement sleeve is (080 + 205 + 063) = **348**.

**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.

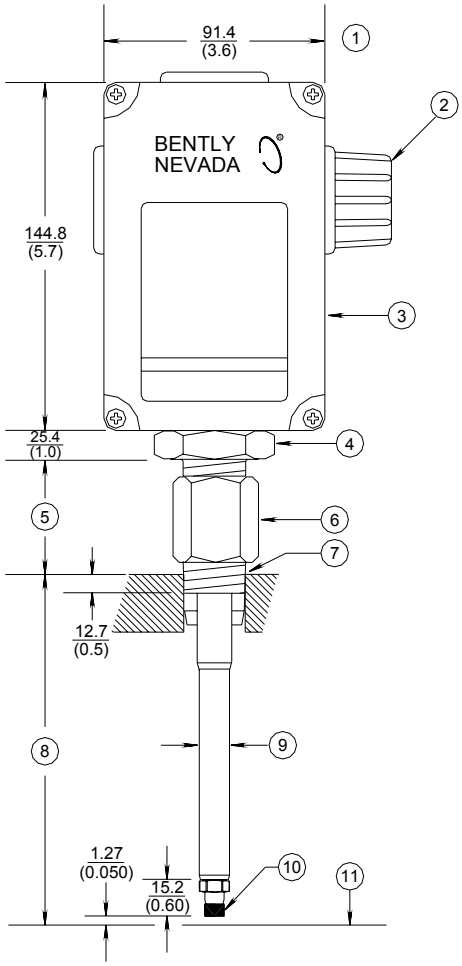
# Field wiring diagram

## Dimensional Drawing

### Figure information

Notes:

1. "B" plus "C" dimensions greater than 305 mm (12 in) require additional sleeve support near the probe to stiffen the assembly and avoid the influence of resonance.
2. 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).
3. "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.




| | |
|---|---|
| 1 | Depth = 76.2 (3.0) |
| 2 | Fitting “D” |
| 3 | PROXPAC® 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 2 Dimensions for PROXPAC® Proximity Transducer Assembly Dimensions are in millimetres (inches)**