

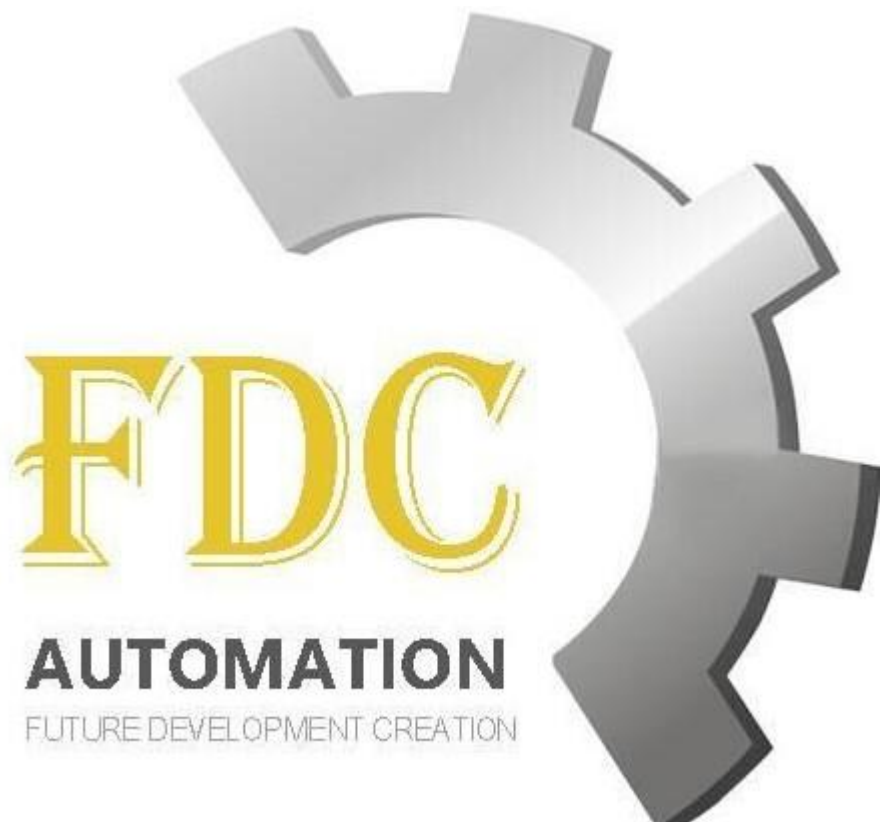
## *FDC Automation Co., Limited.*

<http://www.fdcplc.com>

Contact Ways:

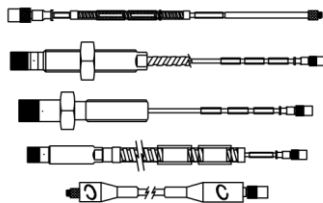
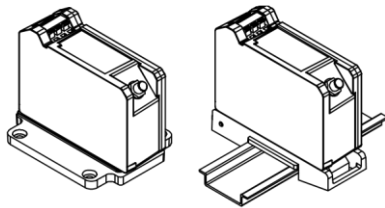
Telp / WhatsApp : +86 1812 4578 712  
+86 1812 6051 536

E-mail: [fay@free-plc.com](mailto:fay@free-plc.com) [vicky@free-plc.com](mailto:vicky@free-plc.com)



# XL 8 mm Proximity Transducer System

## Specifications and Ordering Information



for vibration

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### Description

#### Transducer System

The 3300 XL 8 mm Proximity Transducer System consists of:

- a 3300 XL 8 mm probe
- a 3300 XL extension cable
- a 3300 XL Proximator® Sensor<sup>1</sup>

The system provides an output voltage directly proportional to the distance between the probe tip and the observed conductive surface. It is capable of both static (position) and dynamic (vibration) measurements, and is primarily used

and position measurement applications on fluid-film bearing machines, as well as Keyphasor® and speed measurement applications<sup>2</sup>.

The 3300 XL 8 mm system represents our most advanced performance in an eddy current proximity transducer system. The standard 3300 XL 8 mm 5 metre system

is also 100% compliant with the American Petroleum Institute's (API) 670 Standard (4<sup>th</sup> Edition) for mechanical configuration, linear range, accuracy, and temperature stability. All 3300 XL 8 mm Proximity Transducer Systems achieve this level of

performance while allowing complete interchangeability of probe, extension cable, and Proximator® Sensor without the need for individual component matching or bench calibration.

Each component of the 3300 XL 8 mm Transducer System is backward compatible

and interchangeable<sup>3</sup> with other non-XL 3300 series 5 and 8 mm transducer system components<sup>4</sup>. This includes the 3300 5 mm probe, which is used when an 8 mm probe is too large for the available mounting space<sup>5,6</sup>.

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### Proximator® Sensor

The 3300 XL Proximator® Sensor incorporates numerous improvements over

previous designs. Its physical packaging permits high-density DIN-rail installation. It can also be mounted in a traditional panel mount configuration, where it shares an identical "footprint" to older 4-hole mounted Proximator® Sensor designs. The

mounting base for either option provides electrical isolation, eliminating the need for separate isolator plates. The 3300 XL Proximator® Sensor is highly immune to radio frequency interference, allowing installation in fiberglass housings without

adverse effects from nearby radio frequency signals. Improved RFI/EMI immunity allows the 3300 XL Proximity® Sensor to achieve 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.



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### 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 is more securely attached as well, incorporating a patented CableLoc™ design that provides 330 N (75 lbf) pull strength where the probe cable attaches to the probe tip.

3300 XL 8 mm Probes and Extension Cables can also be ordered with an optional FluidLoc® cable option. This option prevents oil and other liquids from leaking out of the machine through the cable's interior.

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### Connectors

The 3300 XL probe, extension cable, and Proximity® Sensor have 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. They do not require any special tools for installation or removal.

3300 XL 8 mm Probes and Extension Cables can also be ordered with connector protectors already installed. Connector protectors can also be supplied separately for installation in the field (such as when the cable must be run through restrictive conduit). Connector protectors are recommended for all installations and provide increased environmental protection<sup>7</sup>.

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### Extended Temperature Range Applications

An Extended Temperature Range (ETR) Probe and Extension Cable are available for applications where either the probe lead or extension cable may exceed the 177 °C (350 °F) temperature specification. The Extended Temperature Range Probe has an extended temperature rating for up to 260 °C (500 °F) for the probe lead and connector. The probe tip must remain below 177 °C (350 °F). The Extended Temperature Range Extension Cable is also rated for 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 Proximity Sensor. When using any ETR component as part of your system, the accuracy is limited to the accuracy of the ETR system. **Notes:**

1. Proximity® Sensors are supplied by default from the factory calibrated to AISI 4140 steel. Calibration to other target materials is available upon request.
2. 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.
3. 3300 XL 8 mm components are both electrically and physically interchangeable with non-XL 3300 5 and 8 mm components. Although the packaging of the 3300 XL Proximity® Sensor differs from its predecessor, it is designed to fit 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).

4. When XL and non-XL 3300-series 5 and 8 mm system components are mixed, system performance is limited to the specifications for the non-XL 3300 5 and 8 mm Transducer System.
5. The 3300-series 5 mm probe (refer to Specifications and Ordering Information p/n 141605-01) uses smaller physical packaging, but does not permit reduced sideview clearances or tip-to-tip spacing requirements compared to an 8 mm probe. It is used when physical (not electrical) constraints preclude the use of an 8 mm probe. When narrow sideview probes are required, use the 3300 NSv™ Proximity Transducer System (refer to Specifications and Ordering Information p/n 147385-01).
6. 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. Bently Nevada recommends the use of 8 mm probes when possible to provide optimal robustness against physical abuse.
7. Silicone tape is also provided with each 3300 XL extension cable and can be used instead of connector protectors. Silicone tape is not recommended in applications where the probe-to-extension cable connection will be exposed to turbine oil.

## Specifications

Unless otherwise noted, the following specifications are for a 3300 XL 8 mm Proximator® Sensor, extension cable and 8 mm probe between +18 °C and +27 °C (+64 °F to +80 °F), with a -24 Vdc power supply, a 10 kilo  $\Omega$  load, an AISI 4140 steel target, and a probe gapped at 1.27 mm (50 mils). Performance characteristics are applicable for systems that consist solely of 3300 XL 8 mm components. The system accuracy and interchangeability specifications do not apply when using a transducer system calibrated to any target other than a Bently Nevada AISI 4140 steel target.

## Electrical

**Proximator®**

**Sensor Input:**

Accepts one noncontacting 3300series 5 mm, 3300 8 mm or 3300 XL 8 mm Proximity Probe and Extension Cable.

### 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  $\Omega$

### Probe dc resistance (nominal) ( $R_{\text{PROBE}}$ ) table:

Probe Length	Resistance from the Center Conductor to the Outer Conductor ( $R_{\text{PROBE}}$ ) (ohms)
0.5	$7.45 \pm 0.50$
1.0	$7.59 \pm 0.50$
1.5	$7.73 \pm 0.50$
2.0	$7.88 \pm 0.50$
5.0	$8.73 \pm 0.70$
9.0	$9.87 \pm 0.90$

### Extension cable dc resistance (nominal):

Length of Extension Cable	Resistance from Center Conductor to Center Conductor ( $R_{\text{CORE}}$ ) (ohms)	Resistance from Outer Conductor to Outer Conductor ( $R_{\text{JACKET}}$ ) (ohms)
3.0	$0.66 \pm 0.10$	$0.20 \pm 0.04$
3.5	$0.77 \pm 0.12$	$0.23 \pm 0.05$
4.0	$0.88 \pm 0.13$	$0.26 \pm 0.05$
4.5	$0.99 \pm 0.15$	$0.30 \pm 0.06$
7.0	$1.54 \pm 0.23$	$0.46 \pm 0.09$
7.5	$1.65 \pm 0.25$	$0.49 \pm 0.10$
8.0	$1.76 \pm 0.26$	$0.53 \pm 0.11$
8.5	$1.87 \pm 0.28$	$0.56 \pm 0.11$

### Extension cable capacitance:

69.9 pF/m (21.3 pF/ft)

### typical Field wiring:

0.2 to 1.5 mm<sup>2</sup> (16 to 24 AWG) .  
 Recommend using three-  
 conductor shielded triax cable  
 and tinned field wiring.  
 Maximum length of 305 metres  
 (1,000 feet) between the 3300  
 XL Proximator® Sensor and the  
 monitor. See the frequency  
 response graphs, figures 10  
 through 13 (pages 22 and 23)  
 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:**

1.27 mm (50

#### **mils) Incremental Scale Factor (ISF)**

##### *Standard 5 metre system:*

7.87 V/mm (200 mV/mil) ±5%  
 including interchangeability  
 error when measured in  
 increments of 0.25 mm  
 (10 mils) over the 80 mil linear  
 range from 0 to +45 °C (+32 °F  
 to +113 °F).

##### *Standard 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 80 mil linear  
 range from 0 to +45 °C (+32 °F  
 to +113 °F).

##### *Extended Temperature Range (ETR) 5 and 9 metre systems:*

7.87 V/mm (200 mV/mil) ±6.5%  
 including interchangeability  
 error when measured in  
 increments of 0.25 mm

(10 mils) over the 80 mil linear  
 range from 0 to +45 °C (+32 °F  
 to +113 °F).

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

##### *Standard 5 metre system:*

Less than ±0.025mm (±1 mil)  
 with components at 0 °C to  
 +45 °C (+32 °F to +113 °F).

##### *Standard 9 metre system:*

Less than ±0.038mm (±1.5 mil)  
 with components at 0 °C to  
 +45 °C (+32 °F to +113 °F).

##### *Extended Temperature Range 5 and 9 metre systems:*

Less than ±0.038mm (±1.5 mil)  
 with components at 0 °C to  
 +45 °C (+32 °F to +113 °F).

#### **Standard 5 metre system performance over extended temperatures:**

Over a probe temperature  
 range of -35 °C to +120 °C (-  
 31 °F to +248 °F) with the  
 Proximator® Sensor and  
 extension cable between 0 °C  
 to +45°C (+32 °F to +113 °F),  
 the ISF remains within ±10% of  
 7.87 V/mm (200 mV/mil) and  
 the DSL remains within ±0.076  
 mm (±3 mils).

Over a Proximator® Sensor  
 and extension cable temperature range of -  
 35 °C to +65 °C (-31 °F to +149 °F) with the  
 probe between 0 °C to +45 °C (+32 °F to  
 +113 °F), the ISF remains within ±10% of 7.87  
 V/mm (200 mV/mil) and the DSL remains within  
 ±0.076 mm (±3 mils). **Standard 9 metre  
system performance over extended  
temperatures:**

Over a probe temperature  
 range of - 35 °C to +120 °C (-  
 31 °F to +248 °F) with the  
 Proximator® Sensor and  
 extension cable between 0 °C  
 to +45°C (+32 °F to +113 °F),  
 the ISF remains within ±18% of

7.87 V/mm (200 mV/mil) and the DSL remains within  $\pm 0.152$  mm ( $\pm 6$  mils).

Over a Proximito<sup>®</sup> Sensor and extension cable temperature range of  $-35^{\circ}\text{C}$  to  $+65^{\circ}\text{C}$  ( $-31^{\circ}\text{F}$  to  $+149^{\circ}\text{F}$ ) with the probe between  $0^{\circ}\text{C}$  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  $\pm 0.152$  mm ( $\pm 6$  mils). **Extended**

**Temperature Range system performance over extended temperatures:**

Over a probe and extension cable temperature range of  $-35^{\circ}\text{C}$  to  $+260^{\circ}\text{C}$  ( $-31^{\circ}\text{F}$  to  $+500^{\circ}\text{F}$ ) with the Proximito<sup>®</sup> Sensor between

$0^{\circ}\text{C}$  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  $\pm 0.152$  mm ( $\pm 6$  mils). **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 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. 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 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:				
Output voltage in mil pp/gauss:				
Gap	5 metre Proximito <sup>®</sup> Sensor	9 metre Proximito <sup>®</sup> Sensor	Probe	Ext. Cable
10 mil	0.0119	0.0247	0.0004	0.0004
50 mil	0.0131	0.0323	0.0014	0.0014
90 mil	0.0133	0.0348	0.0045	0.0045

**Electrical Classification:**

Complies with the European CE mark.

**Hazardous Area Approvals**

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**Note:** Multiple approvals for hazardous areas certified by Canadian Standards Association (CSA/NRTL/C) in North America and by Baseefa (2001) in Europe.

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*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.


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.

T<sub>5</sub> @ T<sub>a</sub> =  $-35^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$ .

T<sub>4</sub> @ T<sub>a</sub> =  $-51^{\circ}\text{C}$  to  $+100^{\circ}\text{C}$ .

*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  
BAS99ATEX3100U, when  
installed per drawing 140979

T5 @ Ta= -35 °C to  
+85 °C

T4 @ Ta= -51 °C to  
+100 °C.

IEC Ex

**3300 XL Proximity®  
Sensor, ia**

IECEX BAS04.0055X

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

Terminal Block Connections

Ui= -28V Ci = 0

Ii= 140mA Li =10μH

Pi= 0.84W

Coaxial Connection

Ui = -28V Ci= 5.7nF

Ii = 140mA Li = 0.85mH

Pi = 0.84W

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 following values:

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

The Proximity®  
must be  
installed so as  
to minimize the  
risk of impact or

friction with other metallic surfaces. **3300 XL**

**Proximity® Sensor, nA**

IECEX BAS04.0057X

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

The terminals must be provided with a level of protection of at least IP54.

Ui = -28V

**3300 XL 8mm Eddy Current Probe, ia**

IECEX BAS04.0056

AEx ia IIC Temperature Classification per the table below.

Temperature Classification	Ambient Temperature (Probe Only)
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

Ui = -28V Ci  
= 1.5nF

Ii = 140mA Li  
= 200μH

Pi =0.84W

**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.

## Mechanical

**Probe Tip**

**Material:**

Polyphenylene sulfide

(PPS). **Probe Case Material:**

AISI 303 or 304 stainless steel

(SST). **Probe Cable**

**Specifications:**

*Standard  
cable:*

75 Ω triaxial, fluoroethylene  
propylene (FEP) insulated  
probe cable in the following  
total probe lengths: 0.5, 1, 1.5,  
2, 5, or 9 metres.

*Extended  
Temperature  
Range cable:*

75  $\Omega$  triaxial, perfluoroalkoxy (PFA) insulated probe cable in the following total probe lengths: 0.5, 1, 1.5, 2, 5, or 9 metres.

**Extension Cable Material:**

75  $\Omega$  triaxial, fluoroethylene propylene (FEP) insulated.

**Extended**

**Temperature**

**Range (ETR)**

**Extension Cable**

**Material:**

75  $\Omega$  triaxial, perfluoroalkoxy (PFA) insulated. **Proximitor® Sensor Material:**  
A308 aluminum

**System Length:**

5 or 9 metres including extension cable **Standard Probe and Extension Cable**

**Armor (optional):**

Flexible AISI 302 or 304 SST with FEP outer jacket. **Extended**

**Temperature Range**

**Probe and**

**Extension Cable**

**Armor (optional):**

Flexible AISI 302 or 304 SST with PFA 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:	Maximum Rated	Recommended
Standard forwardmounted probes	33.9 N•m (300 in•lbf)	11.2 N•m (100 in•lbf)
Standard forwardmount 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)

**Connector-to-connector torque**

*Recommended torque:*

see table:

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

*Maximum torque:*

0.565 N•m (5

in•lbf) **Minimum Bend Radius:**

25.4 mm (1.0 in)

**Total System Mass (typical):**

0.7 kg (1.5 lbf)

*Probe:*

323 g (11.38 oz)

*Extension Cable:*

34 g/m (0.4 oz/ft)

*Armored*

*Extension cable:*

103 g/m (1.5 oz/ft)

*Proximitor®*

*Sensor:*

246 g (8.7 oz)

**Environmental Limits**

**Probe Temperature Range**

*Operating and Storage*

*Temperature:*

*Standard probe:*

-51 °C to +177 °C (-60 °F to +351 °F)

*Extended*

*Temperature*

*Range probe:*

-51 °C to +177 °C (-60 °F to +351 °F) for the probe tip; -51 °C to +260 °C (-60 °F to +500 °F) for the probe cable and connector.

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

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## Extension Cable Temperature Range

### *Operating and Storage Temperature:*

#### *Standard cable:*

-51 °C to +177 °C (-60 °F to +351 °F)

#### *Extended Temperature Range cable:*

-51 °C to +260 °C (-60 °F to +500 °F)

## Proximito<sup>®</sup> Sensor Temperature Range

### *Operating Temperature:*

-51 °C to +100 °C (-60 °F to +212 °F)

### *Storage Temperature:*

-51 °C to +105 °C (-60 °F to

### +221 °F) **Relative Humidity:**

Less than a 3% change in Average Scale Factor (ASF) when tested in 93% humidity in accordance with IEC standard 68-2-3 for up to 56 days.

### **Probe Pressure:**

3300 XL 8 mm probes are designed to seal differential pressure between the probe tip and case. The probe sealing material consists of a Viton<sup>®</sup> O-ring. 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.

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**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. In addition,

solutions with high or low pH values may erode the tip assembly of the probe causing media leakage into surrounding areas. Bently Nevada, LLC will not be held responsible for any damages resulting from leaking 3300 XL 8 mm proximity probes. In addition, 3300 XL 8 mm proximity probes will not be replaced under the service plan due to probe leakage.

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## **Patents:**

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

Components or procedures described in these patents apply to this product.

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## **Ordering Information**

### **3300 XL 8 mm Proximity Probes:**

**330101 3300 XL 8 mm Probe, 3/8-24 UNF thread, without armor<sup>3</sup>**

**330102 3300 XL 8 mm Probe, 3/8-24 UNF thread, with armor<sup>3</sup>**

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

### **EXX Option Descriptions**

#### **A: Unthreaded Length Option**

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**Note:** Unthreaded length must be at least 0.8 inches less than the case length.

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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

#### **Threaded length 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 metre (1.6 feet)
- 10** 1.0 metre (3.3 feet)
- 15** 1.5 metre (4.9 feet)
- 20** 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)

#### D: Connector and Cable-Type Option

- 0 1** Miniature coaxial ClickLoc™ connector with connector protector, standard cable
- 02** Miniature coaxial ClickLoc™ connector, standard cable
- 1 1** Miniature coaxial ClickLoc™ connector with connector protector, FluidLoc® cable
- 1 2** Miniature coaxial ClickLoc™ connector, FluidLoc® cable

#### E: Agency Approval Option

- 0 0** Not required
- 0 5** Multiple Approvals

### 3300 XL 8 mm Proximity Probes,

#### Metric:

**330103** 3300 XL 8 mm Probe, M10 x 1 thread, without armor<sup>3</sup>

**330104** 3300 XL 8 mm Probe, M10 x 1 thread, with armor<sup>3</sup>

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

#### Option Descriptions

##### A: Unthreaded Length Option

**Note:** Unthreaded length must be at least 20 mm less than the case length.

Order in increments of 10 mm.

#### Length configuration:

**Maximum unthreaded length:**  
230 mm

**Minimum unthreaded length:**  
0 mm

**Example:** 0 6 = 60 mm

#### B: Overall Case Length Option

Order in increments of 10 mm.

#### Metric thread configurations:

**Maximum length:** 250 mm

**Minimum length:** 20 mm

**Example:** 0 6 = 60

#### mm C: Total Length Option

- 05** 0.5 metre (1.6 feet)
- 10** 1.0 metre (3.3 feet)
- 15** 1.5 metres (4.9 feet)
- 20** 2.0 metres (6.6 feet) **5**
- 0** 5.0 metres (16.4 feet)  
1
- 9 0** 9.0 metres (29.5 feet)

#### D: Connector and Cable-Type Option

- 0 1** Miniature coaxial ClickLoc™ connector with connector protector, standard cable
- 02** Miniature coaxial ClickLoc™ connector, standard cable
- 1 1** Miniature coaxial ClickLoc™ connector with connector protector, FluidLoc® cable **1 2**  
Miniature coaxial ClickLoc™ connector, FluidLoc® cable

#### E: Agency Approval Option

- 0 0** Not required
- 0 5** Multiple Approvals

### 3300 XL 8 mm Reverse Mount Probes

**330105-02-12-CXX-DXX-EXX, 3/8-24 UNF threads<sup>3</sup>**

**330106-05-30-CXX-DXX-EXX, M10 x 1 threads<sup>3</sup>**  
**Option Descriptions**

#### C: Total Length Option

- 0 5** 0.5 metre (1.6 feet)
- 1 0** 1.0 metre (3.3 feet)
- 1 5** 1.5 metre (4.9 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)

**D:** Connector Option

- 0 2** Miniature ClickLoc™ coaxial connector
- 1 2** Miniature ClickLoc™ coaxial connector, FluidLoc® cable

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**Note:** The FluidLoc® cable options –10 and –12 are not necessary on the vast majority of 330105 and 330106 installations due to the presence of the probe sleeve. Consider carefully the application before ordering the FluidLoc® cable options

---

**E:** Agency Approval Option

- 0 0** Not required
- 0 5** Multiple Approvals

---

**3300 XL 8 mm Proximity Probes, Smooth Case:**

**330140** 3300 XL 8 mm Probe without armor<sup>2</sup>

**330141** 3300 XL 8 mm Probe with armor<sup>2</sup>

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

**Option Descriptions**

**A:** Overall Case Length  
Option Order in  
increments of 0.1 in  
**Length configurations:**  
**Maximum length:** 9.6 in  
**Minimum length:** 0.8 in  
**Example:** 2 4 = 2.4 in

**B:** Total Length Option

- 0 5** 0.5 metre (1.6 feet)
- 1 0** 1.0 metre (3.3 feet)
- 1 5** 1.5 metres (4.9 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:** Connector and Cable-Type Option

- 0 1** Miniature coaxial ClickLoc™ connector with connector protector, standard cable
- 0 2** Miniature coaxial ClickLoc™ connector, standard cable
- 1 1** Miniature coaxial ClickLoc™ connector with connector protector, FluidLoc® cable
- 1 2** Miniature coaxial ClickLoc™ connector, FluidLoc® cable

**D:** Agency Approval Option

- 0 0** Not required
- 0 5** Multiple Approvals

---

**3300 XL 8 mm Extended Temperature Range (ETR) Proximity Probes:**

**330191** 3300 XL 8 mm ETR Probe, 3/8-24 UNF thread, without armor

**330192** 3300 XL 8 mm ETR Probe, 3/8-24 UNF thread, with armor

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

**DXX Option Descriptions**

**A:** Unthreaded Length Option

---

**Note:** Unthreaded length must be at least 0.8 inches 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:** 1 5 = 1.5 in

**B:** Overall Case Length Option

Order in increments of 0.5 in

**Threaded length**

**configurations:**

**Maximum case length:** 9.6 in

**Minimum case length:** 0.8 in

**Example:** 2 5 = 2.5

in **C:** Total Length Option

**05** 0.5 metre (1.6 feet)  
**10** 1.0 metre (3.3 feet)  
**15** 1.5 metre (4.9 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)

**D:** Agency Approval Option

**00** Not required  
**05** Multiple Approvals

---

**3300 XL 8 mm Extended Temperature Range (ETR) Proximity Probes, Metric:**  
**330193** 3300 XL 8 mm Probe, M10 x 1 thread, without armor

**330194** 3300 XL 8 mm Probe, M10 x 1 thread, with armor

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

**DXX Option Descriptions**

**A:** Unthreaded Length Option

**Note:** Unthreaded length must be at least 20 mm less than the case length.

Order in increments of 10 mm.

**Length configuration:**

**Maximum unthreaded length:**  
230 mm

**Minimum unthreaded length:**  
0 mm

**Example:** 0 6 = 60 mm

**B:** Overall Case Length Option

Order in increments of 10 mm.

**Metric thread configurations:**

**Maximum length:** 250 mm

**Minimum length:** 20 mm

**Example:** 0 6 = 60

mm **C:** Total Length Option

**05** 0.5 metre (1.6 feet)

**10** 1.0 metre (3.3 feet)

**15** 1.5 metres (4.9 feet)

**20** 2.0 metres (6.6 feet) **5**

**0** 5.0 metres (16.4 feet)<sup>1</sup>

**90** 9.0 metres (29.5 feet)

**D:** Agency Approval Option

**00** Not required

**05** Multiple Approvals

---

**3300 XL 8 mm Extended Temperature Range (ETR) Reverse Mount Probes**  
**330195-02-12-CXX-DXX, 3/8-24 UNF threads**  
**330196-05-30-CXX-DXX, M10 x 1 threads**

**Option**

**Descriptions C:**

Total Length Option

**05** 0.5 metre (1.6 feet)

**10** 1.0 metre (3.3 feet)

**15** 1.5 metre (4.9 feet)

**20** 2.0 metres (6.6 feet) **5**

**0** 5.0 metres (16.4 feet)<sup>1</sup>

**90** 9.0 metres (29.5 feet)

**D:** Agency Approval Option

**00** Not required

**05** Multiple Approvals

---

**3300 XL 8 mm Extended Temperature Range (ETR) Proximity Probes, Smooth Case:**

**330197** 3300 XL 8 mm Probe without armor<sup>2</sup>

**330198** 3300 XL 8 mm Probe with armor<sup>2</sup>

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

**Option Descriptions**

**A:** Overall Case Length  
Option Order in  
increments of 0.5 in  
**Length**  
**configurations:**

**Maximum length:** 9.5 in

**Minimum length:** 1.0 in

**Example:** 3 5 = 3.5

in **B:** Total Length Option

**05** 0.5 metre (1.6 feet)  
**10** 1.0 metre (3.3 feet)  
**15** 1.5 metres (4.9 feet)  
**20** 2.0 metres (6.6 feet) **5**  
**0** 5.0 metres (16.4 feet)

1

**90** 9.0 metres (29.5 feet)

**C:** Agency Approval Option

**00** Not required  
**05** Multiple Approvals

---

### **3300 XL Proximator® Sensor** **330180-AXX-BXX**

**Option Descriptions A:** Total Length and Mounting Option **50** 5.0 metre (16.4 feet) system length, panel mount **51** 5.0 metre (16.4 feet) system length, DIN mount **52** 5.0 metre (16.4 feet) system length, no mounting hardware **90** 9.0 metres (29.5 feet) system length, panel mount **91** 9.0 metres (29.5 feet) system length, DIN mount **92** 9.0 metres (29.5 feet) system length, no mounting hardware

**B:** Agency Approval Option

**00** Not required  
**05** Multiple approvals

---

### **3300 XL Extension Cable** **330130-AXXX-BXX-CXX**

---

**Note:** Make sure that the extension cable length and the probe length, when added together, equal the Proximator® Sensor total length.

---

#### **Option Descriptions**

**A:** Cable Length

Option

**030** 3.0 metres (9.8 feet)  
**035** 3.5 metres (11.5 feet)  
**040** 4.0 metres (13.1 feet)  
**045** 4.5 metres (14.8 feet)  
**070** 7.0 metres (22.9 feet)  
**075** 7.5 metres (24.6 feet)  
**080** 8.0 metres (26.2 feet)  
**085** 8.5 metres (27.9 feet)

**B:** Connector Protector and Cable Option

**00** Standard cable  
**01** Armored cable **02** Standard cable with connector protectors  
**03** Armored cable with connector protectors  
**10** FluidLoc® cable  
**11** Armored FluidLoc® cable  
**12** FluidLoc® cable with connector protectors  
**13** Armored FluidLoc® cable with connector protectors

**C:** Agency Approval Option

**00** Not required  
**05** Multiple Approvals

---

### **3300 XL Extended Temperature Range (ETR) Extension Cable** **330190-AXXX-BXX-CXX**

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**Note:** Make sure that the extension cable length and the probe length, when added together, equal the Proximator® Sensor total length.

---

#### **Option Descriptions**

**A:** Cable Length

Option

**030** 3.0 metres (9.8 feet)  
**035** 3.5 metres (11.5 feet)

- 0 4 0** 4.0 metres (13.1 feet)
- 0 4 5** 4.5 metres (14.8 feet)
- 0 7 0** 7.0 metres (22.9 feet)
- 0 7 5** 7.5 metres (24.6 feet)
- 0 8 0** 8.0 metres (26.2 feet)
- 0 8 5** 8.5 metres (27.9 feet)

**B:** Cable Option

- 0 0** Standard cable
- 0 1** Armored cable

**C:** Agency Approval Option

- 0 0** Not required
- 0 5** Multiple Approvals

## Accessories

141078-01

**Manual**

159484

**Performance Specification –**  
3300 XL Proximity Transducer  
System

162735

**Performance Specification –**  
3300 XL ETR probes and  
extension cables

02120015

**Bulk field wire.** 1.0 mm<sup>2</sup> (18  
AWG), 3 conductor, twisted,  
shielded cable with drain wire.  
Specify length in feet.

### 137491-AXX

**Aluminum probe clamp  
bracket<sup>2</sup>**

#### Option Descriptions

**A:** Mounting screw  
option

- 0 1** 10-24 UNC-2A mounting  
screws

- 0 2** M5 x 0.8-6g mounting

screws

The aluminum clamp bracket is an unthreaded mounting bracket designed to 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.

### 137492-AXX

**Aluminum probe threaded  
mounting bracket**

#### Option

#### Descriptions A:

Thread size

- 0 1** 3/8-24

- 0 4** 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 is supplied with two 10-24 UNC-2A mounting screws. The -04 option is supplied with two M5 x 0.8-6g mounting screws. The mounting screws have pre-drilled holes for safety wire.

### 27474-AXX

**Phenolic threaded probe  
mounting bracket Option Descriptions**

**A:** Thread size

- 0 1** 3/8-24

- 0 4** M10 x 1

The phenolic threaded mounting bracket is recommended if additional electric isolation from the mounting location is required (as in some generator and electrical motor bearing locations). The -01 option is supplied with two 10-24 UNC2A mounting screws. The -04 option is supplied with two M5 x 0.8-6g mounting screws. The mounting screws have pre-drilled holes for safety wire.

138492-01

**Replacement panel-mount  
mounting pad**

138493-01

**Replacement DIN-mount  
mounting pad**

148722-01

**3300 XL Test Plug.** The 3300  
XL

Test Plug contains three small  
test pins attached to three  
color-coded wires 1 metre in

length, each terminated in a banana plug. The three-pin adapter plugs into the test pin holes on 3300 XL-style Proximito<sup>®</sup>r Sensors. It is used to check the performance of the Proximito<sup>®</sup>r Sensor from the test pin holes in the terminal strip without requiring the removal of the field wiring.

03839410

**75 ohm 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.

04310310

**3300 XL Proximito<sup>®</sup>r Sensor Panel-mount Screws.** Package includes four 6-32 UNC thread forming mounting screws. (Supplied standard with Proximito<sup>®</sup>r Housings [3300 XL panel-mount option]).

03839420

**75 ohm Triaxial 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 Proximito<sup>®</sup>r Sensor and protect it from the environment.

03200006

**Silicone self-fusing tape.** A 9.1 metre (10 yard) roll of silicone tape to protect connectors. It is easy to install and provides excellent electrical isolation and protection from the environment. It is not recommended for use inside the casing of the machine.

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.

40113-02

**Connector Protector Kit.** Connector Protector Kit for 3300 XL 8 mm probes and extension cables, including connector protectors and installation tools.

04301008

**M10 x 1 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.

136536-01

**Connector Protector Adapter.**

Allows connector protector installation tools manufactured prior to 1998 to be used with 75 Ω ClickLoc<sup>™</sup> connectors. 40180-02

330153-01

**Connector Protectors.** Package contains 10 pairs of connector protectors for 3300 XL 8 mm probes and 3300 XL 5 and 8 mm extension cables.

**3300 XL Connector Kit.** Used on 3300 XL 8 mm probes and extension cables. Contains one pair of male and female ClickLoc<sup>™</sup> connectors, two

color-coded sleeves, two pieces of slit FEP tubing, and one strip of silicone tape.

163356

**Connector Crimp Tool Kit.**

Includes one set of multiconnector inserts and connector installation instructions. Compatible only with 330153 connector kits or with probes shipped in 2003 or later with ClickLoc™ connectors uninstalled. Supplied with carrying case.

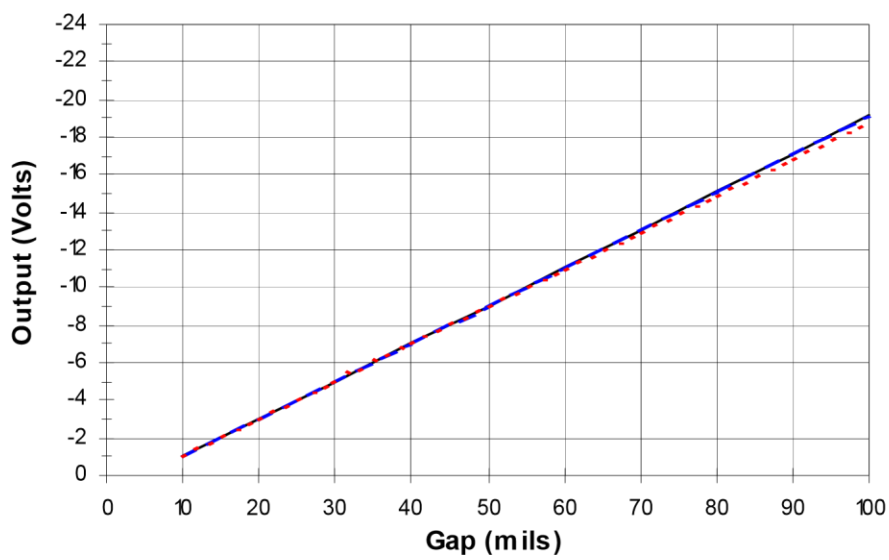
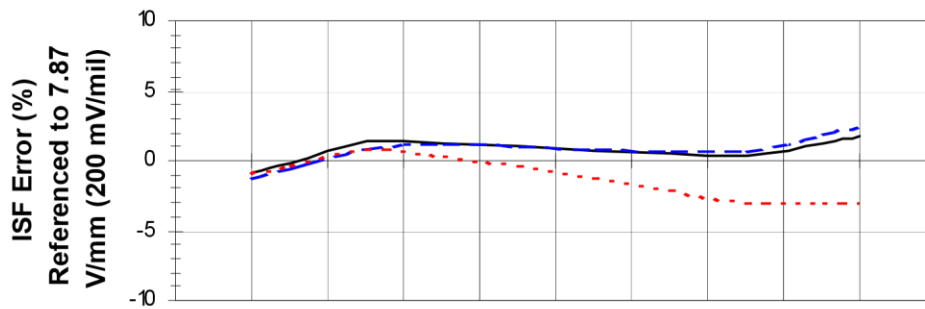
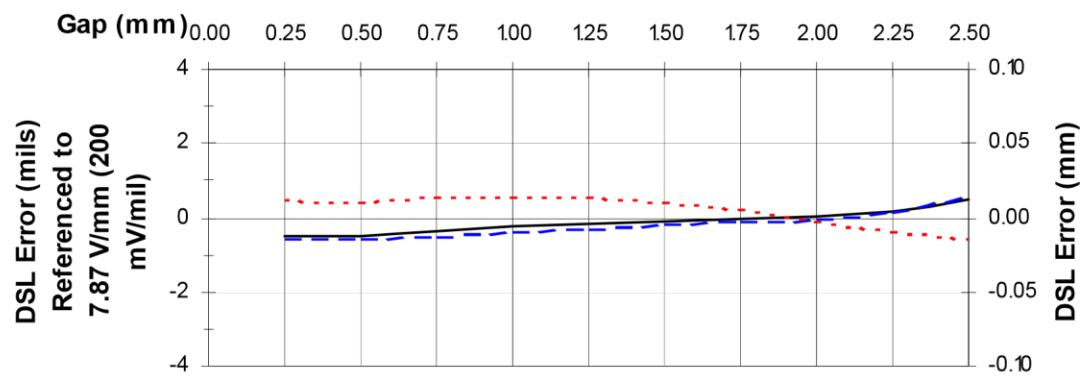
**Notes:**

1. Five metre probes are designed for use with the five metre Proximator® Sensor only.
2. Mounting clamps must be ordered separately for 330140, 330141, 330197, and 330198.
3. For a shorter delivery time, order commonly stocked probes. Currently, stocked probes consist of the following part numbers:  
  
330101-00-08-05-02-00, 330101-00-08-05-0205,  
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, 330103-00-03-10-02-05, 330103-00-04-10-02-00, 330103-00-04-50-02-00, 330103-00-05-10-02-00, 330103-00-06-10-02-00, 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, 330106-05-30-1002-00 and 330106-05-30-10-02-05.

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## Graphs and Dimensional Drawings



— 5m @ 25 °C (77 °F)    - - - 5m @ 45 °C (113 °F)    . . . 5m @ 0 °C (32 °F)

Figure 1 Typical 3300 XL 8 mm 5 m System over API 670 Testing Range

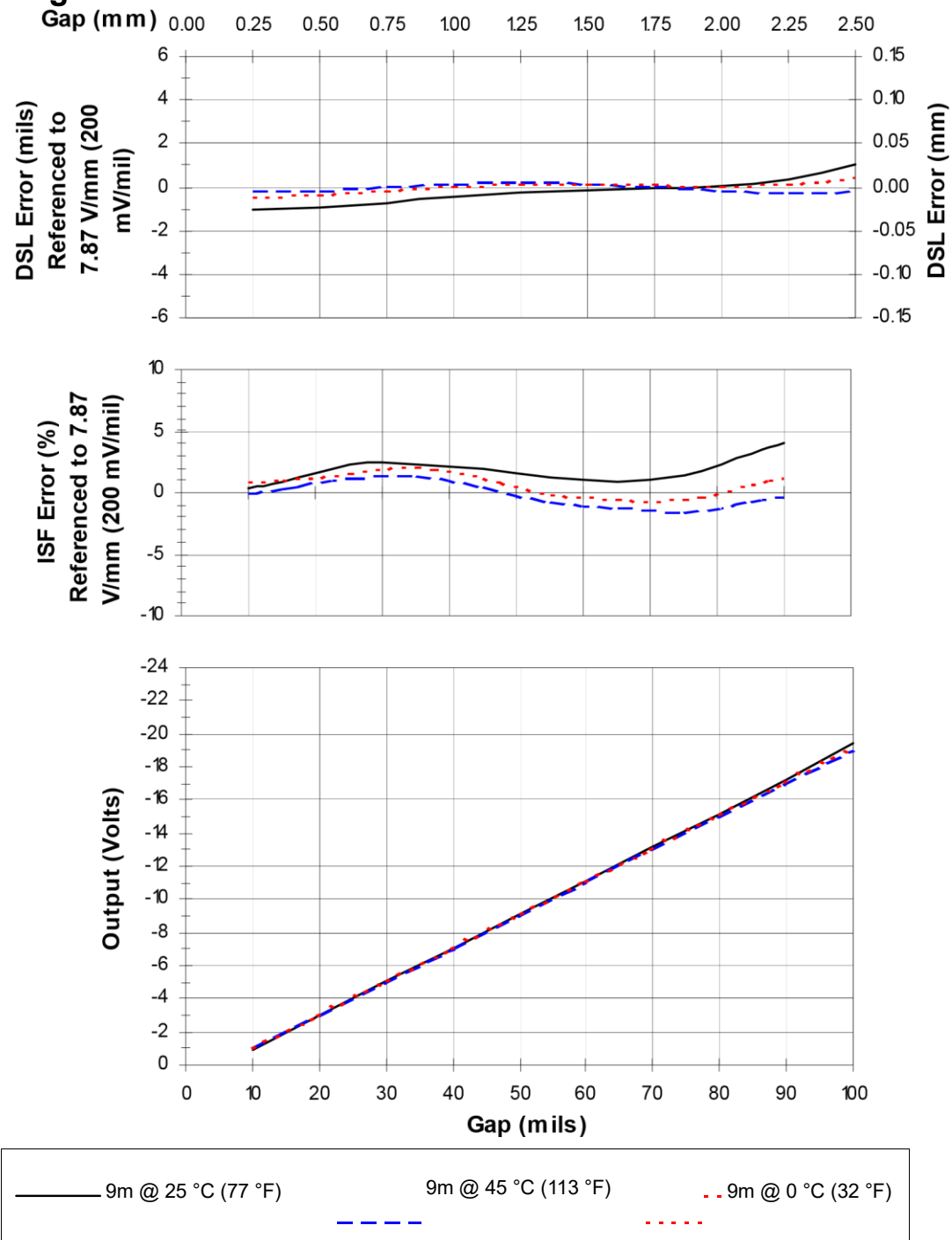
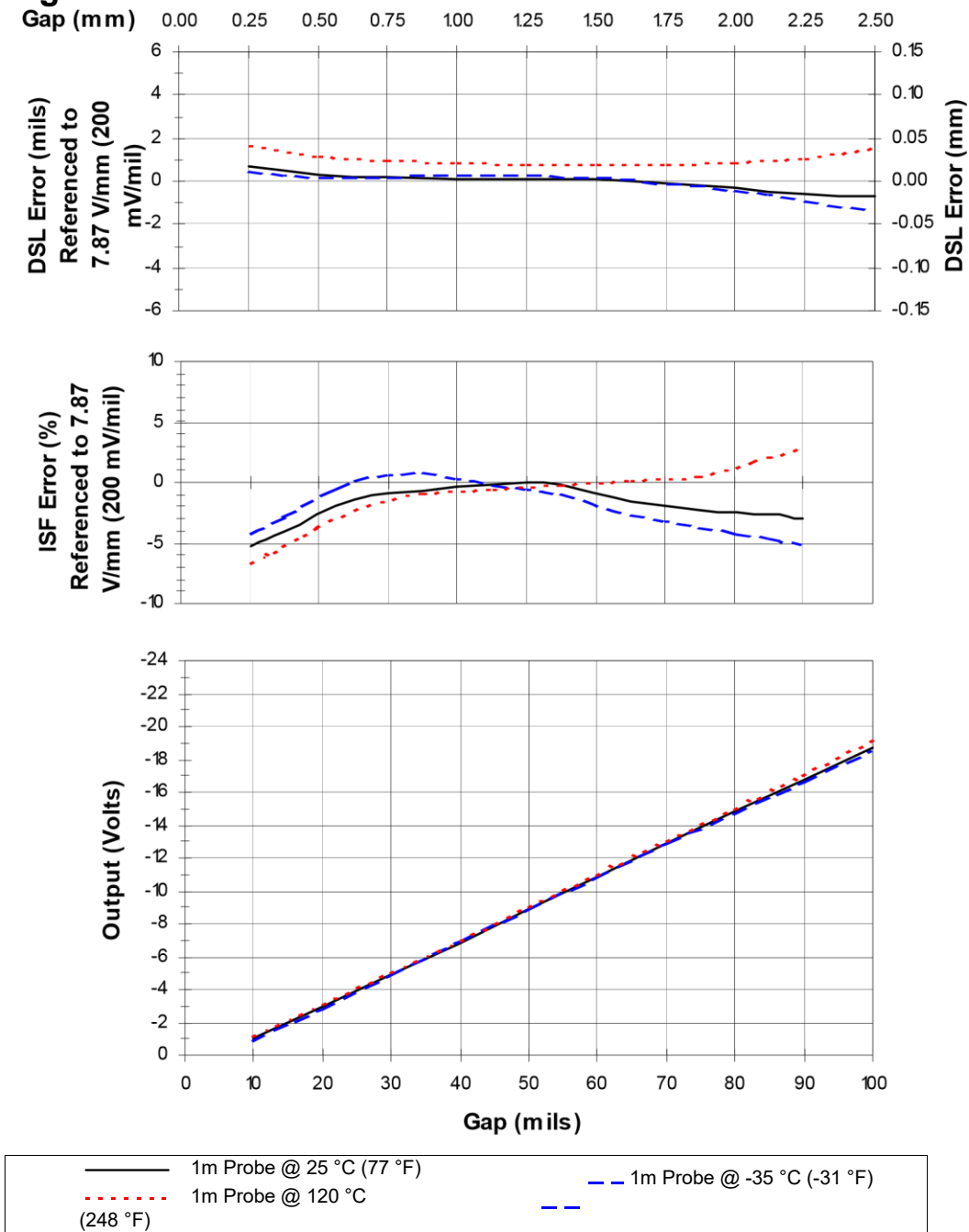


Figure 2 Typical 3300 XL 8 mm 9 m System over API 670 Testing Range



**Figure 3 Typical 3300 XL 8 mm Probe over API 670 Operating Range**

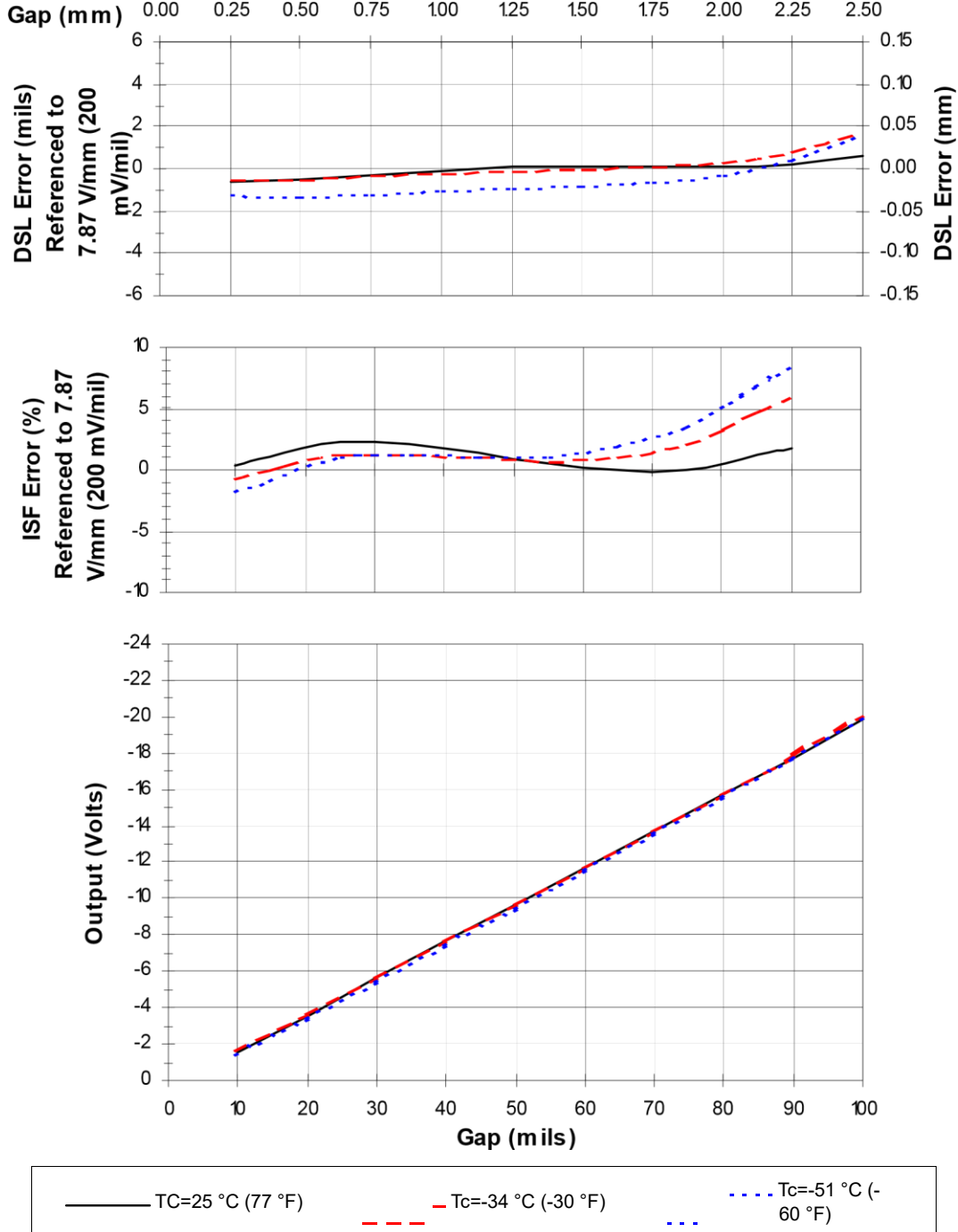


Figure 4 Typical 3300 XL 8 mm 5 m Proximitor® Sensor with 4 m of Extension Cable @ Tc (Probe is at 25 °C)

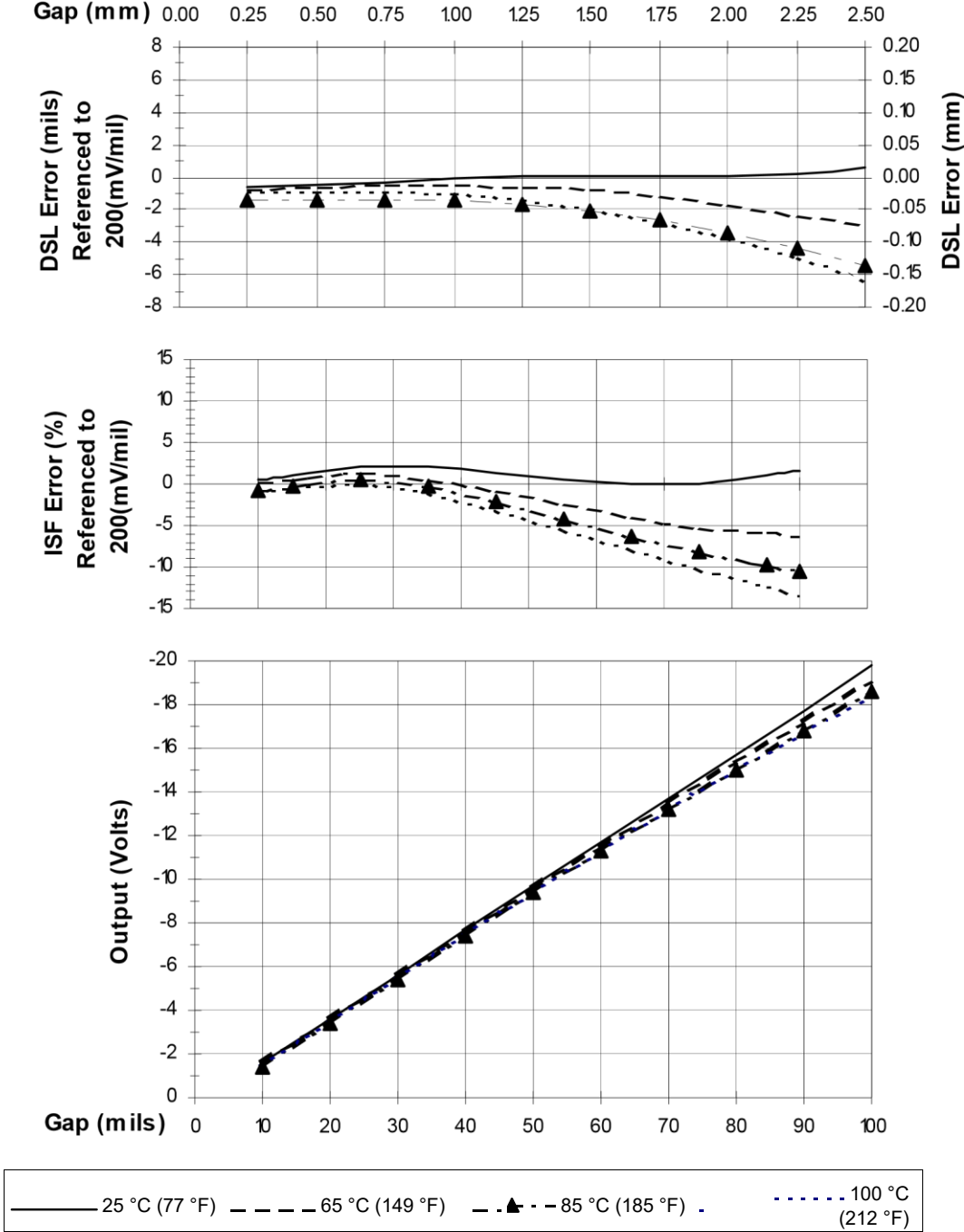


Figure 5 Typical 3300 XL 8 mm 5 m Proximitor® Sensor with 4 m Extension Cable @ Th (Probe is at 25°C)

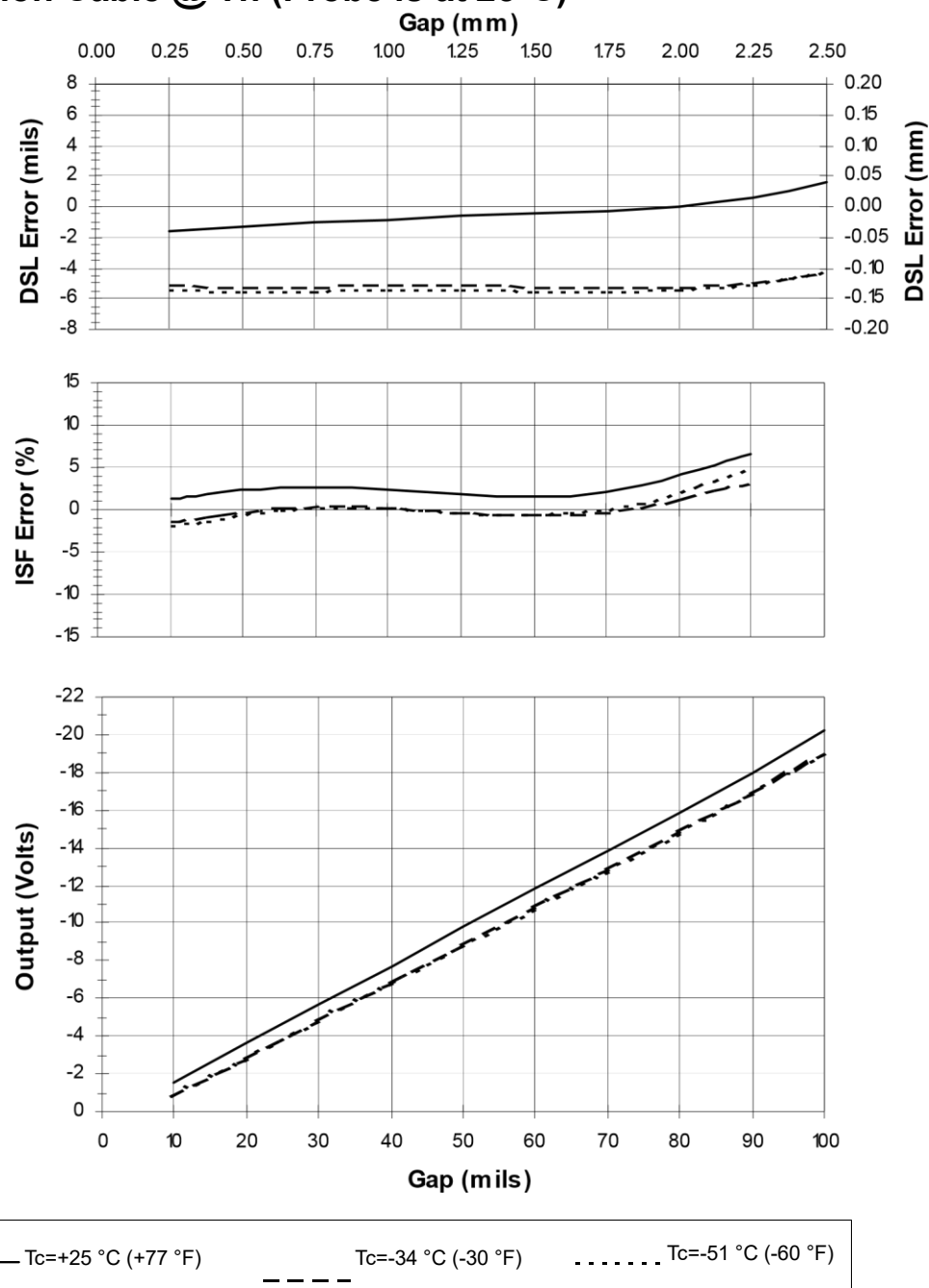


Figure 6 Typical 3300 XL 8 mm 9 m Proximity® Sensor with 8 m of Extension Cable @ Tc (Probe is at 25 °C)

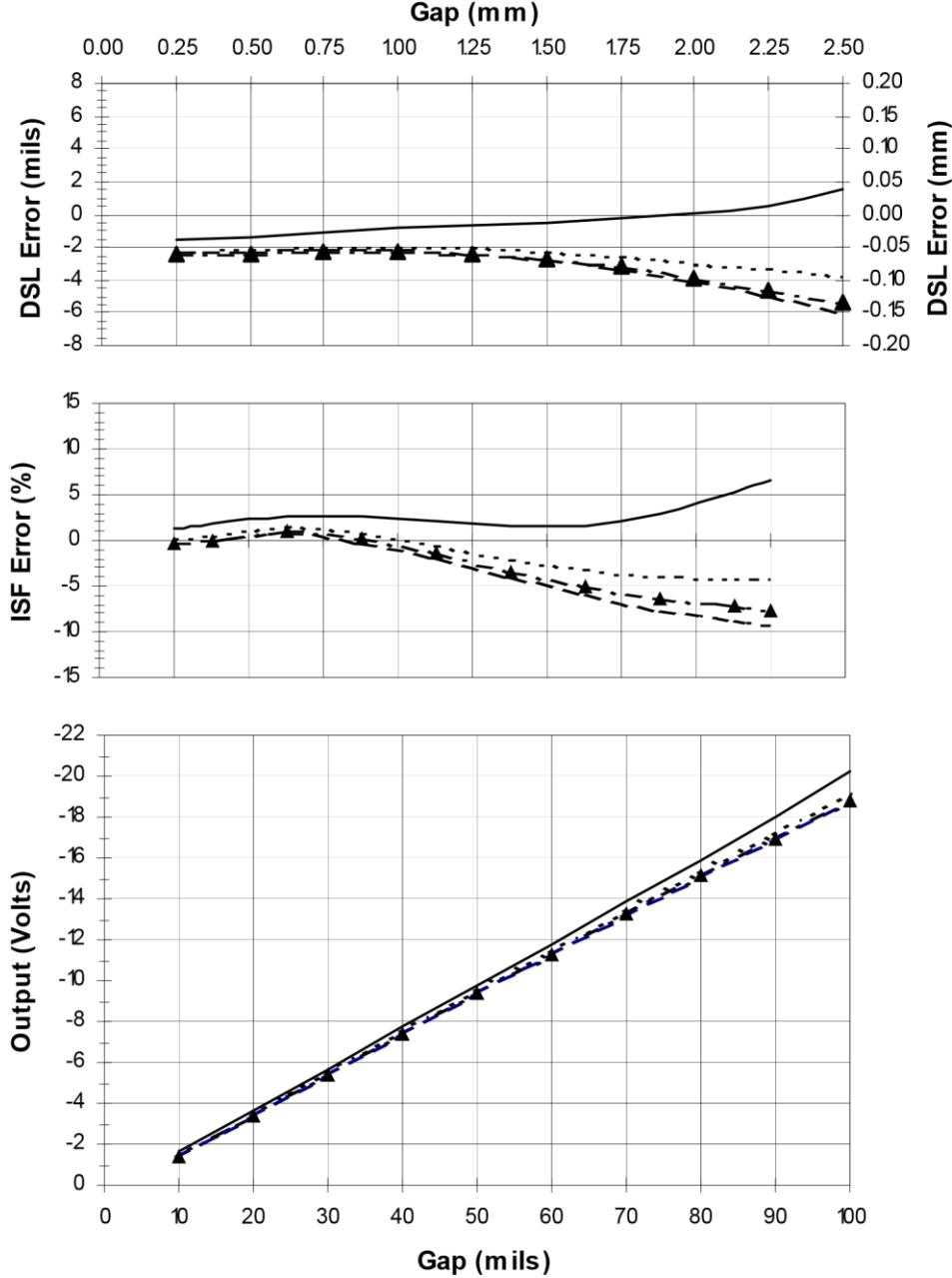
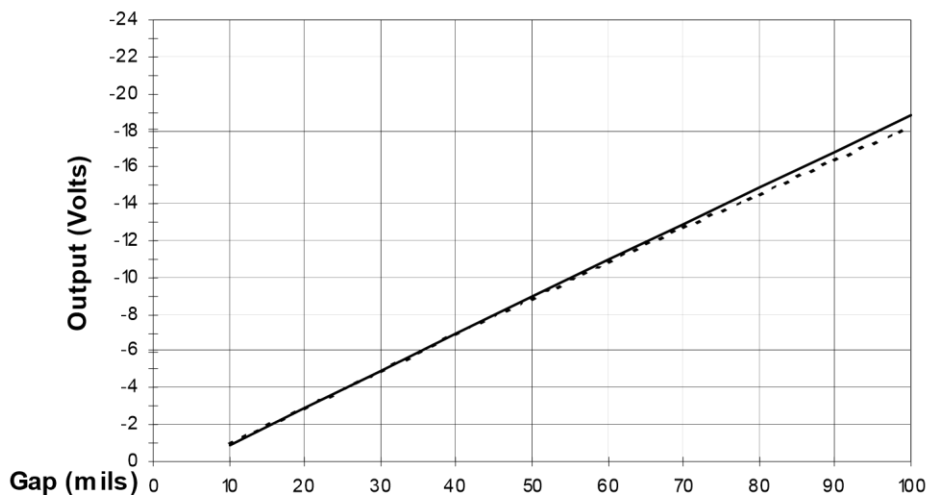
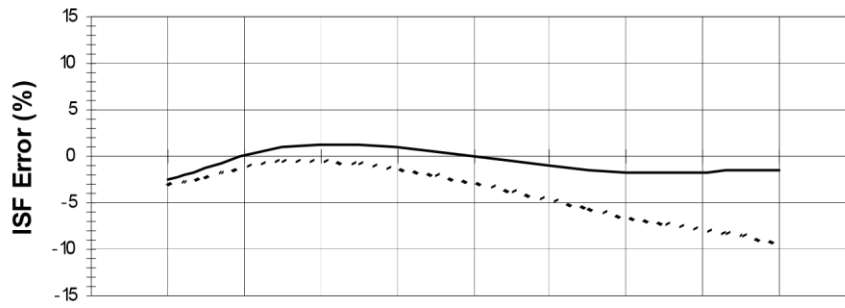
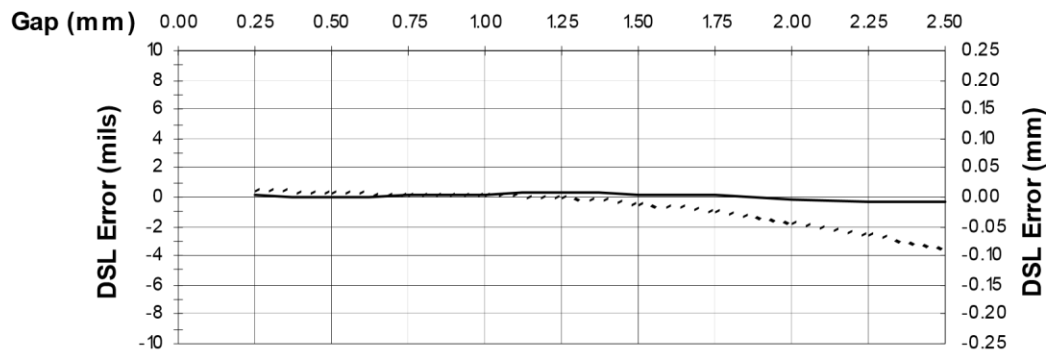


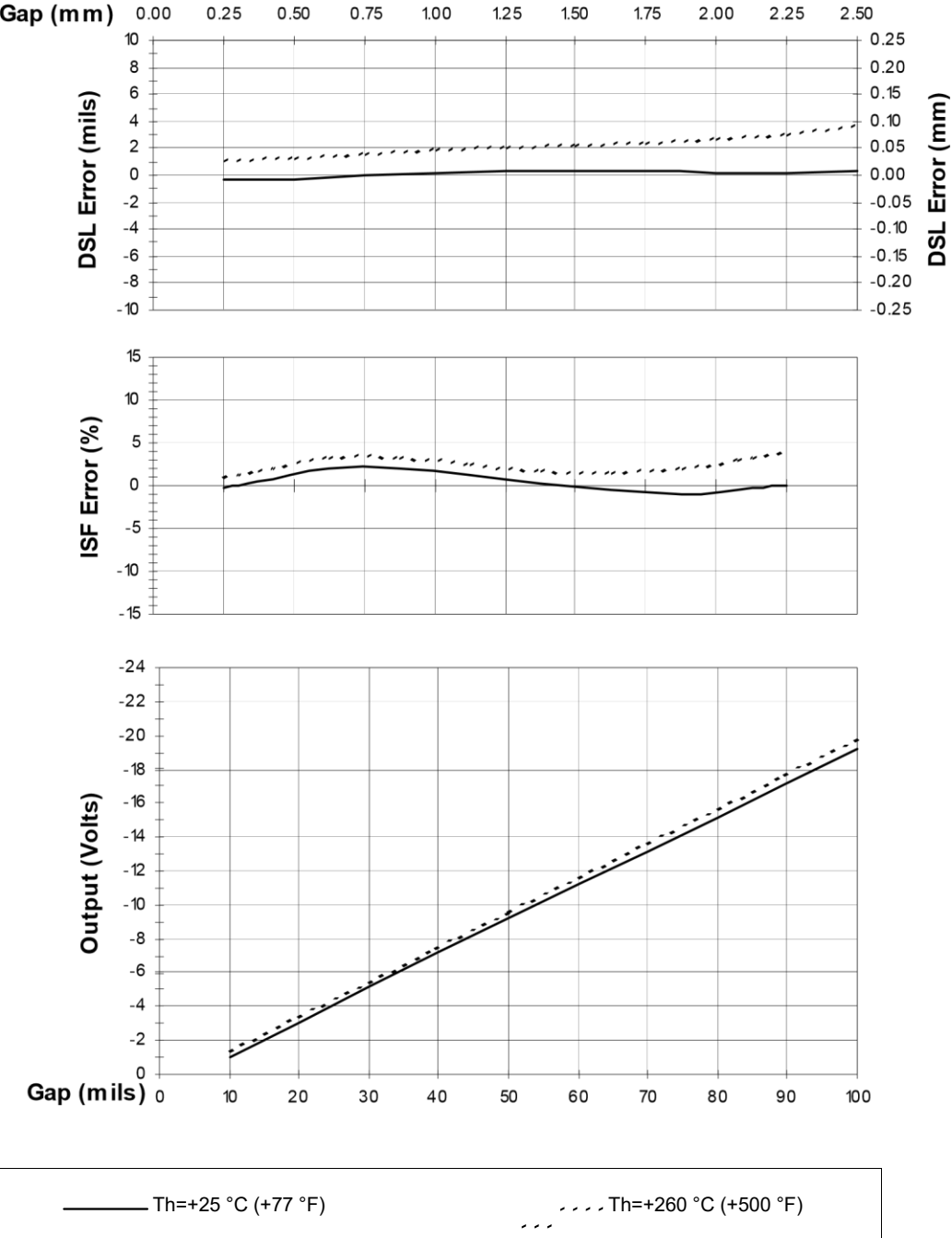
Figure 7 Typical 3300 XL 8 mm 9 m Proximity® Sensor with 8 m of Extension Cable @ Th (Probe is at 25 °C)



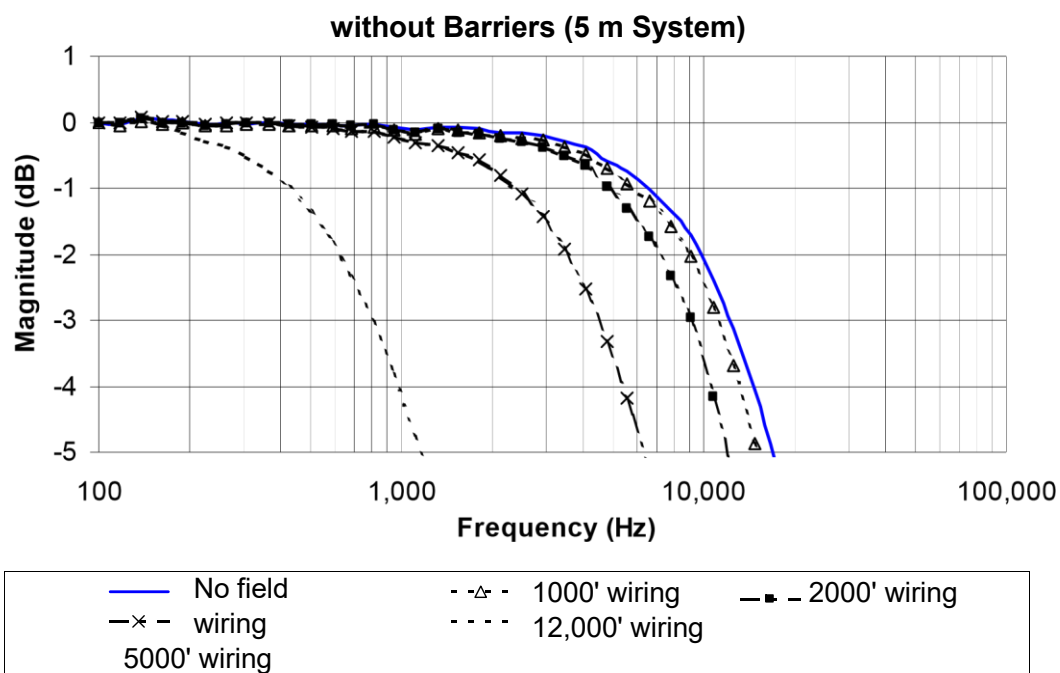
—— Th=+25 °C (+77 °F)

..... Th =+260 °C (+500 °F)

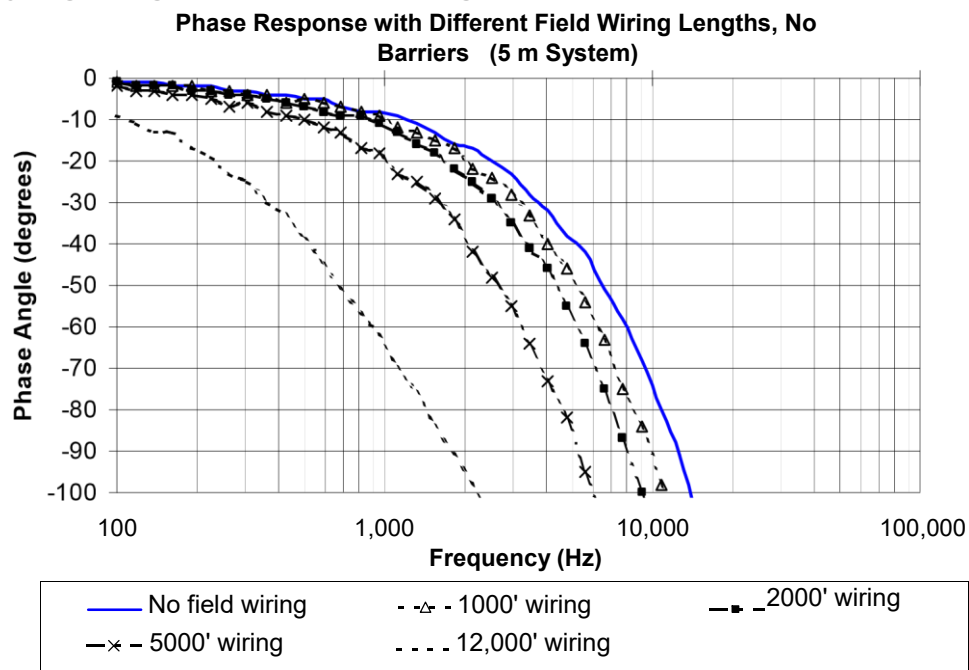
**Figure 8 Typical 3300 XL Extended Temperature Range Probe and 4 metres of Extended Temperature Range Extension Cable @ Th  
(Proximitor Sensor and probe tip with 1 foot of cable are at +25 °C)**



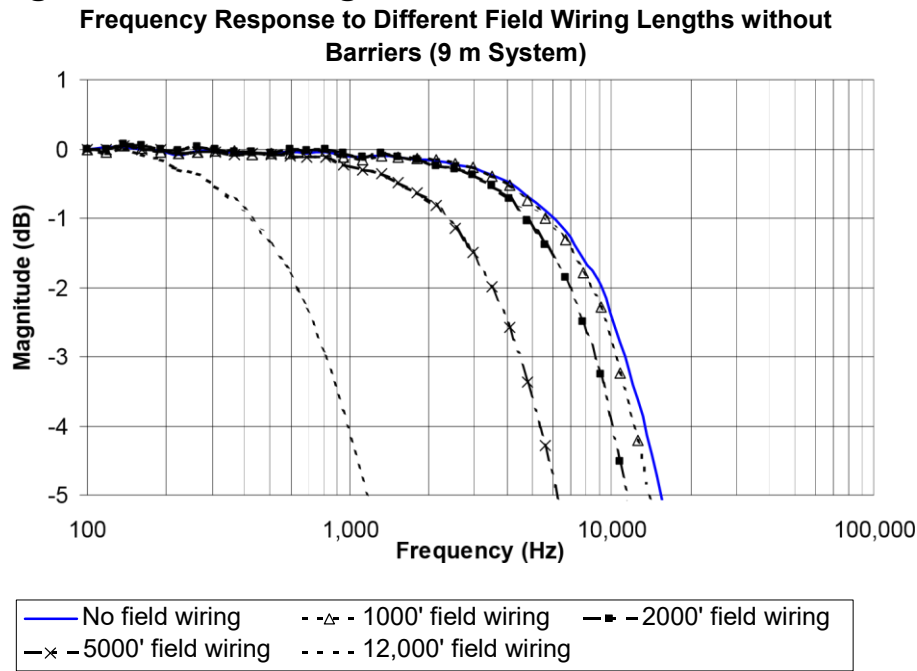
**Figure 9 Typical 3300 XL Extended Temperature Range Probe and 8 metres of Extended Temperature Range Extension Cable @ Th  
(Proximitor Sensor and probe tip with 1 foot of cable are at +25 °C)**  
 Frequency Response to Different Field Wiring Lengths



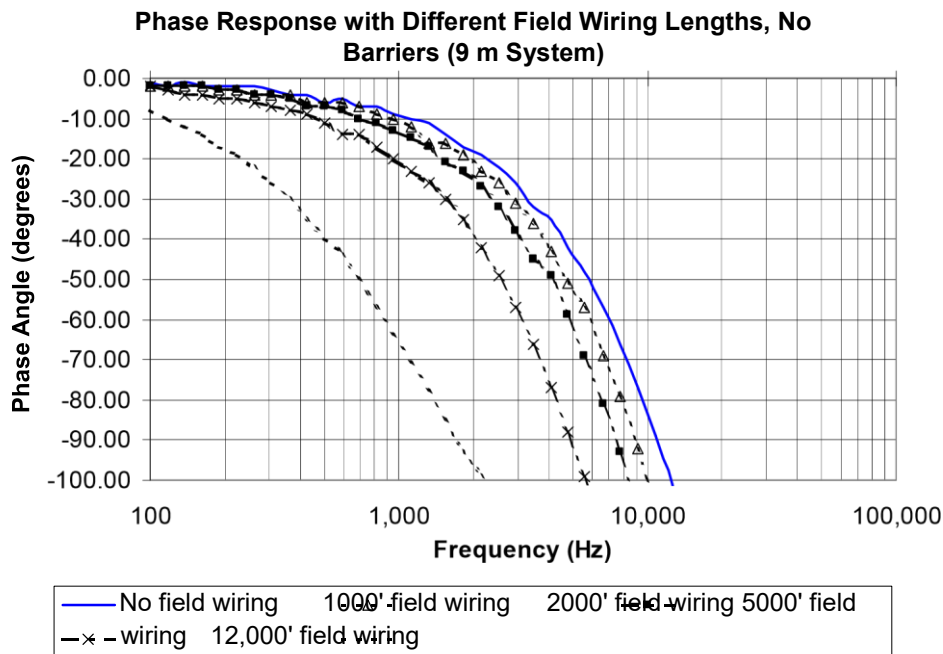
**Figure 10 Frequency Response, typical 3300 XL 8 mm 5 m System with varying lengths of field wiring attached, no barriers**



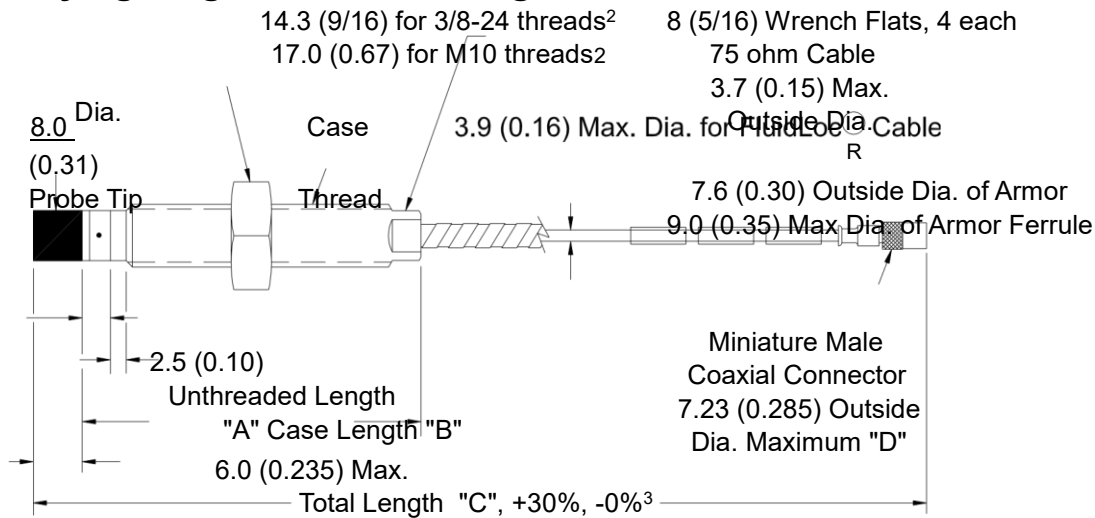
**Figure 11 Phase Response, typical 3300 XL 8 mm 5 m System with varying lengths of field wiring attached, no barriers**



**Figure 12 Frequency Response, typical 3300 XL 8 mm 9 m System with varying lengths of field wiring attached, no barriers**



**Figure 13 Phase Response, typical 3300 XL 8 mm 9 m System with varying lengths of field wiring attached, no barriers**



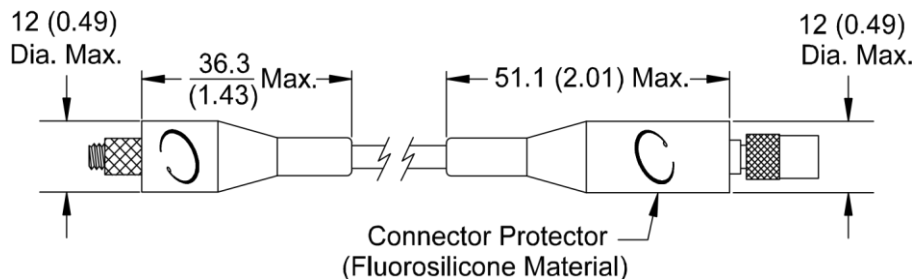
**Figure 14 3300 XL 8 mm Proximity probes, Standard Mount**

330101 and 330191, 3/8-24 UNF-2A, without armor <sup>7</sup>

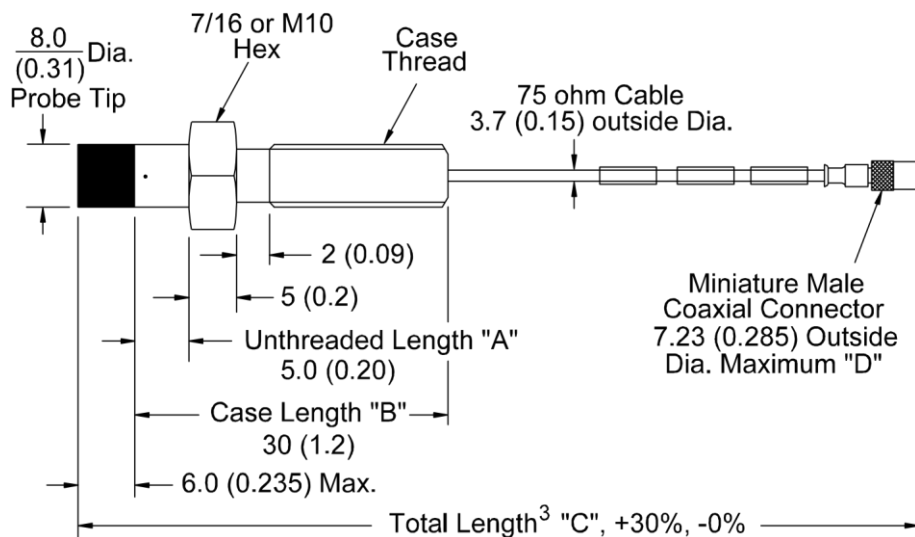
330102 and 330192, 3/8-24 UNF-2A, with armor <sup>6</sup>

330103 and 330193, M10X1 thread, without armor <sup>7</sup>

330104 and 330194, M10X1 thread, with armor <sup>6</sup>



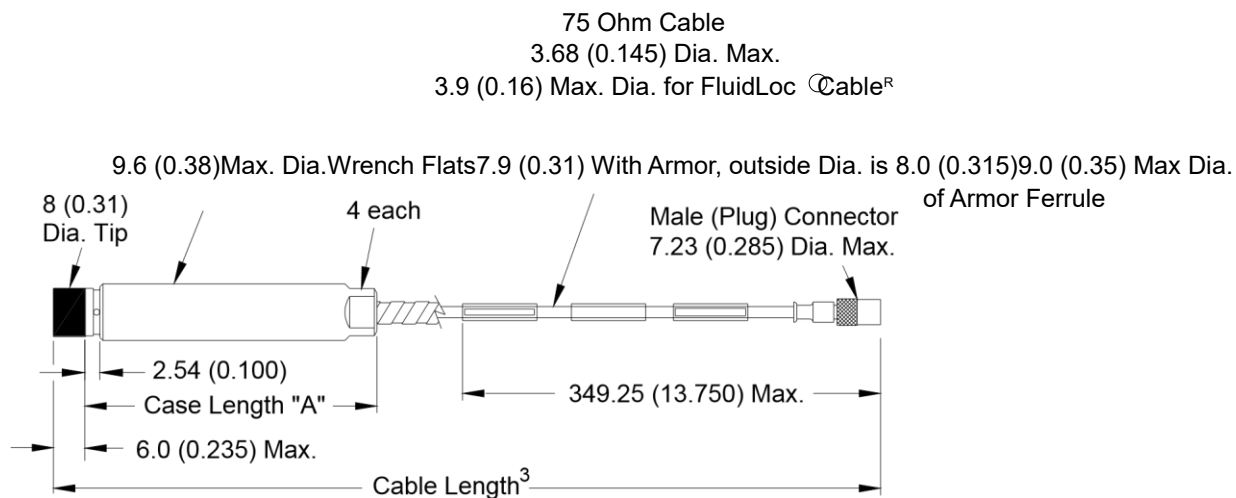
**Figure 15 Installed Connector Protectors**



**Figure 16 3300 XL 8 mm Proximity Probes, Reverse Mount** 4, 7

330105 and 330195, 3/8-24 UNF-2A threads

330106 and 330196, M10X1 threads



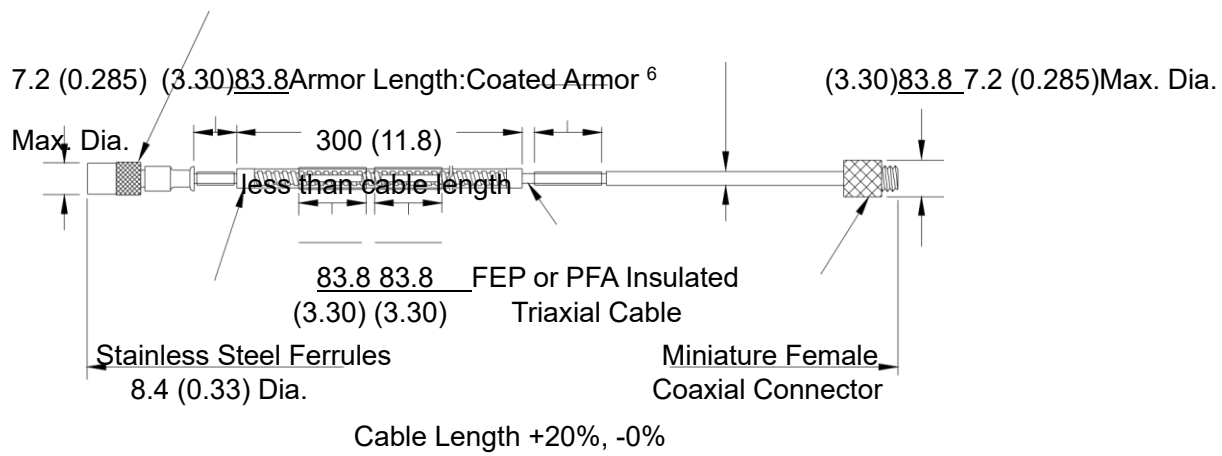
**Figure 17 3300 XL 8 mm Proximity Probes, Smooth Case**

330140 and 330197, without armor<sup>7</sup>

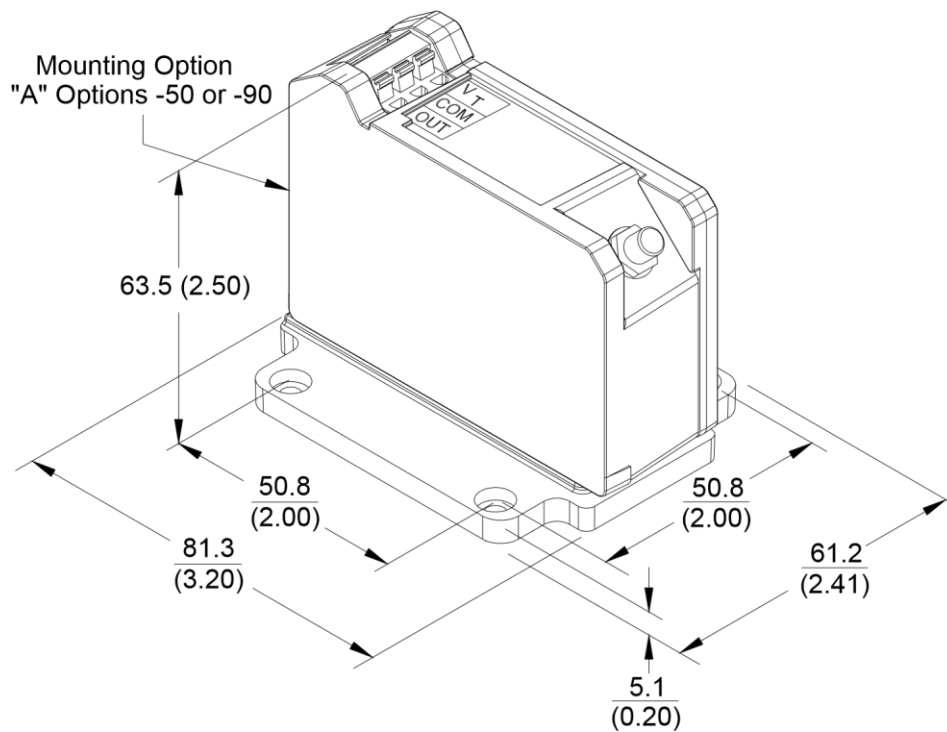
330141 and 330198, with armor<sup>6</sup>

75 ohm cable 3.7 (0.15) max. O.D. 3.9 (0.16) Max. Dia. for FluidLoc Cable®

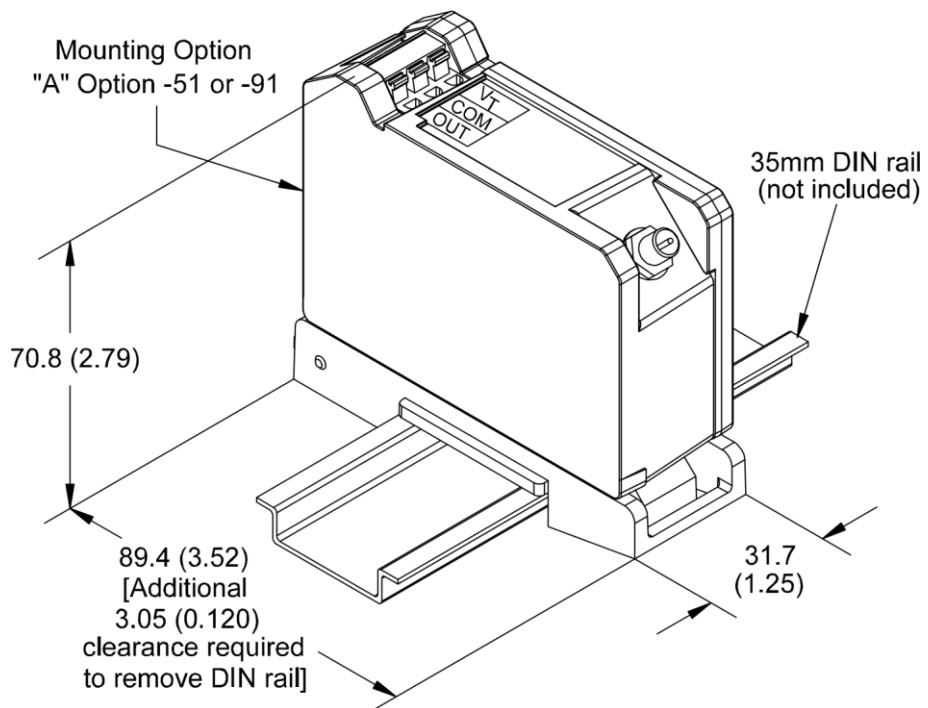
Miniature Male Coaxial Connector 7.6 (0.30) Max. O.D. of Armor FEP or PFA 9.0 (0.35) Max Dia. of Armor Ferrule



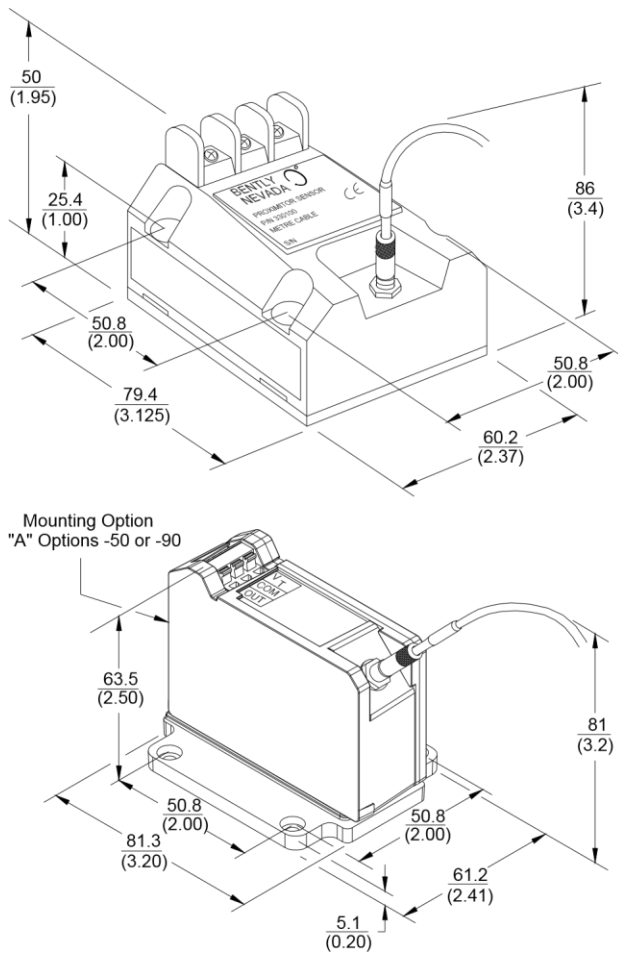
**Figure 18 330130, 3300 XL Extension Cable (FEP armor and insulation) 30190, 3300 XL ETR Extension Cable (PFA armor and insulation)**



**Figure 19 Panel Mount 3300 XL Proximity® Sensor**



**Figure 20 DIN Mount 3300 XL Proximity® Sensor**



**Figure 21 Physical mounting characteristics showing interchangeability of 3300 and 3300 XL Proximator® Sensors when 4-hole mounting option is used:**

**Notes:**

1. All dimensions on figures are in millimetres (inches) unless otherwise noted.
2. Standard mount 8 mm probes supplied with 17 mm or 9/16 inch lock nut.
3. Probes ordered with 5 or 9 metre integral cables have a length tolerance of +20%, -0%.
4. Reverse mount probes not available with armor or connector protector options.
5. Letters inside quotation marks on figures refer to probe ordering options.
6. Stainless steel armor is supplied with FEP outer jacket for standard probes, PFA outer jacket for ETR probes.
7. FEP jacket is standard non-armored portion of the cable for standard probes, PFA jacket on non-armored portion for ETR probes.
8. Use M3.5 or #6 screws for panel-mount Proximator® Sensors (screws provided when purchasing Bently Nevada housings).

## *FDC Automation Co., Limited.*

<http://www.fdcplc.com>

Contact Ways:

Telp / WhatsApp : +86 1812 4578 712  
+86 1812 6051 536

E-mail: [fay@free-plc.com](mailto:fay@free-plc.com) [vicky@free-plc.com](mailto:vicky@free-plc.com)

