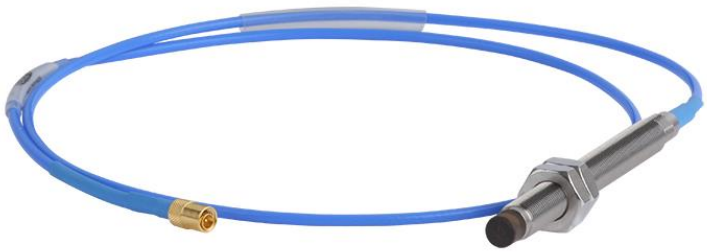
PROTECTION & RELIABILITY
OPTIMIZATION INSTRUMENTS
A CTC COMPANY

PRODUCT MANUAL

DX330851 / DP100851 / DD100880 / DC100854 Series



25mm Proximity Probe Assembly

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Introduction

This document contains information on the operation, installation and maintenance of the DX330851 / DP100851 / DC100854 / DD100880 proximity probe series products.

Description

The DX330851 / DP100851 / DC100854 / DD100880 series proximity probe products utilize an eddy current that produces a negative voltage that is directly proportional to the “gap” distance between the probe and measured surface. 25mm proximity probes are frequently used for measuring differential expansion. The assembly consists of a proximity probe, extension cable and driver. The driver is a 3 or 4 wire device with connections for power, common, and signal output. The driver is intended for use with a DC negative voltage power supply.

Proximity Probe Specifications

PRO Model: DP1008 Series
Bently™ Compatible Model: DX3308 Series

Environmental

Temperature Range: -31°F(-35°C) to 350°F(177°C)
Humidity Range: 0-95% Relative, Non-condensing

Electrical

Note: All specifications acquired through use of an AISI 4140 Steel target, 2.4" in Diameter.

Linear Range

Calibrated Linear Range: 25 to 525 mils (6.35 mm to 13.33 mm)
Nominal Output: -1.5 to -11.5 VDC
Nominal Sensitivity: 20 mV/mil (0.787 V/mm)

Incremental Scale Factor (ISF)

Note: When measured over calibrated linear range in increments of 25 mils

32°F(0°C) to 113°F(45°C)
5 Meter System 20 mV/mil (0.787 V/mm) ± 20%
9 Meter System 20 mV/mil (0.787 V/mm) ± 20%

Deviation from best fit Straight Line (DSL)

Note: When measured over calibrated linear range in increments of 25 mils

32°F(0°C) to 113°F(45°C)
5 Meter System ± 12 mil
9 Meter System ± 12 mil

-31°F(-35°C) to 248°F(120°C)
5 Meter System ± 36 mil
9 Meter System ± 36 mil

Physical

Materials:

25mm Tip: 40% Glass Filled PPS (Polyphenylene Sulfide)
Threaded Case: Stainless Steel
Coaxial Cable: FEP (Fluorinated Ethylene Propylene)
Connector Material: 12-32 Threaded Gold Plated Brass with Teflon Insulators

Weight:

Probe: 2.0 kg (4.4 lb) Max

SECTION 2: PROBE DETAILS

Dimensions:

Cable Lengths:	1.0, 5.0, 9.0 Meters **All probes have length tolerance of (-0% / +30%)**
1 ¼-12 Standard Case:	Available from 1.5” to 9.5” total length No thread lengths available in 0.5” increments up to 1” less than total case length 1 1/8” wrench flats at rear of probe 2x 1 ½” hex nuts for mounting
M30x2 Standard Case:	Available from 30mm to 250mm total length No thread lengths available in 10mm Increments up to 30mm less than total case length 27mm wrench flats at rear of probe 2x 38mm hex nuts for mounting

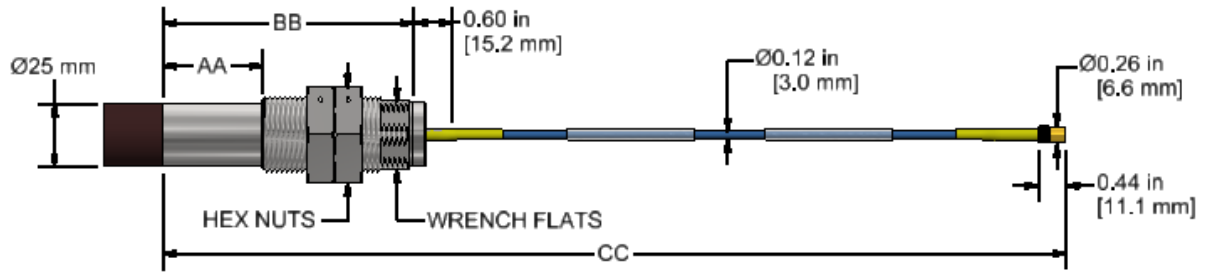

Figure 1 - 25mm Standard Mount Proximity Probe

Proximity Extension Cable Specifications

PRO Model: DC100854 Series
Bently™ Compatible Model: DX330854 Series

Environmental

Temperature Range: -31°F(-35°C) to 350°F(177°C)
Humidity Range: 0-95% Relative, Non-condensing

Physical

Materials:
Coaxial Cable: FEP (Fluorinated Ethylene Propylene)
Connector Material: 12-32 Threaded Gold Plated Brass with Teflon Insulators

Weight:
Cable: 1 kg (2.2 lb) Max

Dimensions:
Cable Lengths: 4.0, 8.0 Meters Nominal
All cables have length tolerance of (-0% / +30%)

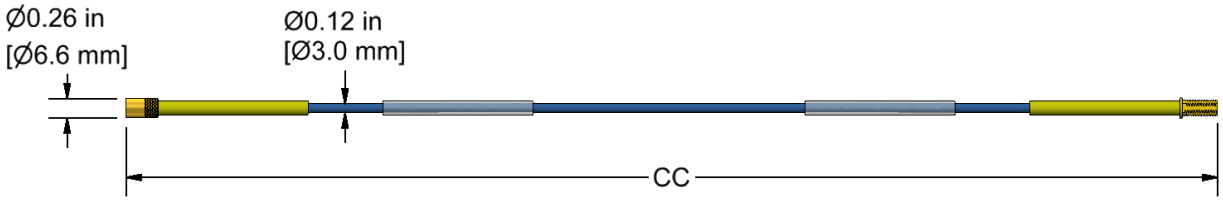

Figure 2 - 25mm Proximity Probe Extension Cable

Proximity Driver Specifications

PRO Model: DD100880 Series
Bently™ Compatible Model: DX330880 Series

Environmental

Temperature Range: -31°F(-35°C) to 185°F(85°C)
Humidity Range: 0-95% Relative, Non-condensing

Electrical

Note: All specifications acquired through use of an AISI 4140 Steel target, 2.4" in Diameter.

Linear Range

Calibrated Linear Range: 25 to 525 mils (6.35 mm to 13.33 mm)
Nominal Output: -1.5 to -11.5 VDC
Nominal Sensitivity: 20 mV/mil (0.787 V/mm)

Incremental Scale Factor (ISF)

Note: When measured over calibrated linear range in increments of 25 mils

32°F(0°C) to 113°F(45°C)
5 Meter System 20 mV/mil (0.787 V/mm) ± 20%
9 Meter System 20 mV/mil (0.787 V/mm) ± 20%

Deviation from best fit Straight Line (DSL)

Note: When measured over calibrated linear range in increments of 25 mils

32°F(0°C) to 113°F(45°C)
5 Meter System ± 12 mil
9 Meter System ± 12 mil

-31°F(-35°C) to 248°F(120°C)
5 Meter System ± 36 mil
9 Meter System ± 36 mil

Operating Power:

Input Voltage Range: -17.5 to -30 VDC
Power Consumption: 0.81W Max
Note: The Driver is protected against reversed polarity.

Isolation:

Case Isolation: Isolated from all connections

Physical

Materials:

Case:	Aluminum
Panel/Din Mount Hardware	Aluminum
Gasket:	Neoprene
Prox Connector:	12-32 Threaded Gold plated Brass with Teflon Insulators
BNC Connector:	Polyester Housing, Gold plated center contact, Polymethylpentene dielectric, Zinc or Nickel plated shell
Terminal Block:	Polyamide

Weight:

Driver:	0.24 kg (0.53 lb) Max

Mounting:

DIN rail:	35mm Standard DIN rail
Panel:	2.0” x 2.0” Panel mount hole pattern

Note: Mounting Screws not included

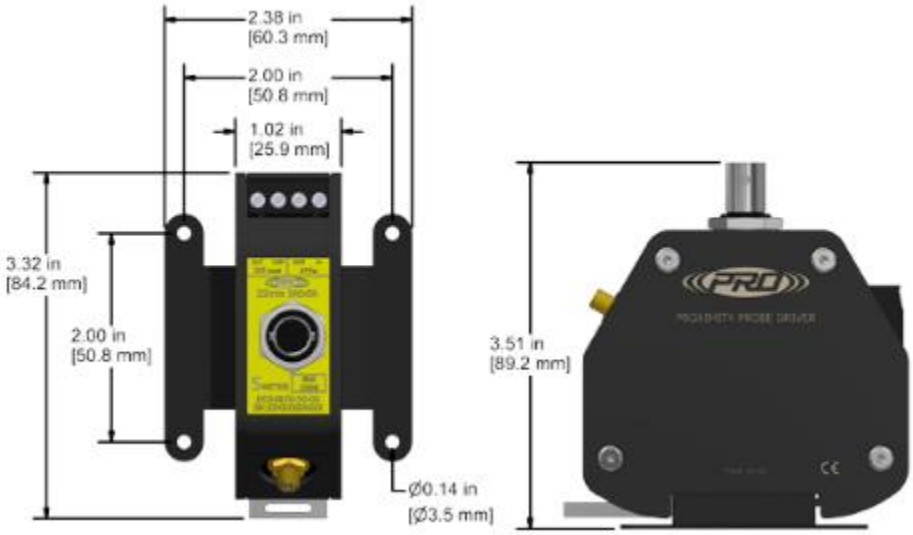

Figure 3 - 25mm Proximity Probe Driver

Installation Information

For most applications, it is recommended that the driver be mounted in a protective housing. More than one driver may share a single housing/enclosure to simplify installation. See PXE Series Enclosures. The drivers are typically din rail mounted in the enclosure. Connection to the probe is established when the integral cabling or a proximity probe or an extension cable are connected to the prox connector on the driver. Excess proximity probe cables should be coiled up inside the housing/enclosure. **Do not cut any cable in a probe system, doing so will affect system accuracy.**

Note: Only PRO DP series and DC series proximity products should be used for the PRO DD series drivers. Only Bently™ Compatible DX series products should be used with each other. Bently™ 3300XL products can be used with the PRO DX series. Substitute cables from other sources should not be used. PRO products are not electrically compatible with other sources and will affect system accuracy.

All connector connections should be tight and secure. Snug the connector screw collar, applying 5 in-lbs (0.6 N-m) of torque.

Note: Do not overtighten the probe cable connection. Do not exceed a torque of 8 in-lbs. (0.9 N-m). Too much torque can cause damage. Probe connectors must not touch any machine metal parts. Proper steps should be taken to isolate connectors from metal surfaces. Connector Protectors are available per request.

Probes are provided with a threaded SST case. In differential expansion measurements, the probes are typically mounted on either side of a thrust collar and measure the axial thermal growth of the rotor with respect to the case of the machine.

Standard mounting blocks are available. Mounting blocks are available in anodized aluminum or phenolic material.

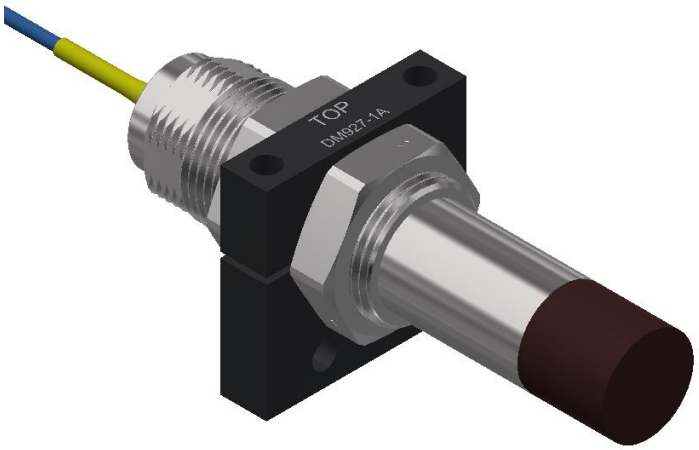

Figure 4 - Aluminum Mounting Blocks Clamping

Electrical Connections

The driver has four terminal connections: V_T, COM, COM and OUT. The -24VDC power is connected to the V_T and COM terminals.

The COM (signal common or signal ground) terminal is isolated from the driver case. COM is not directly connected to the probe cable connectors.

The OUT terminal is the output signal connection, and is a negative voltage output, with the voltage moving more negatively (higher in magnitude) as the gap between the probe and the machine shaft increases. COM is used for the output as well.

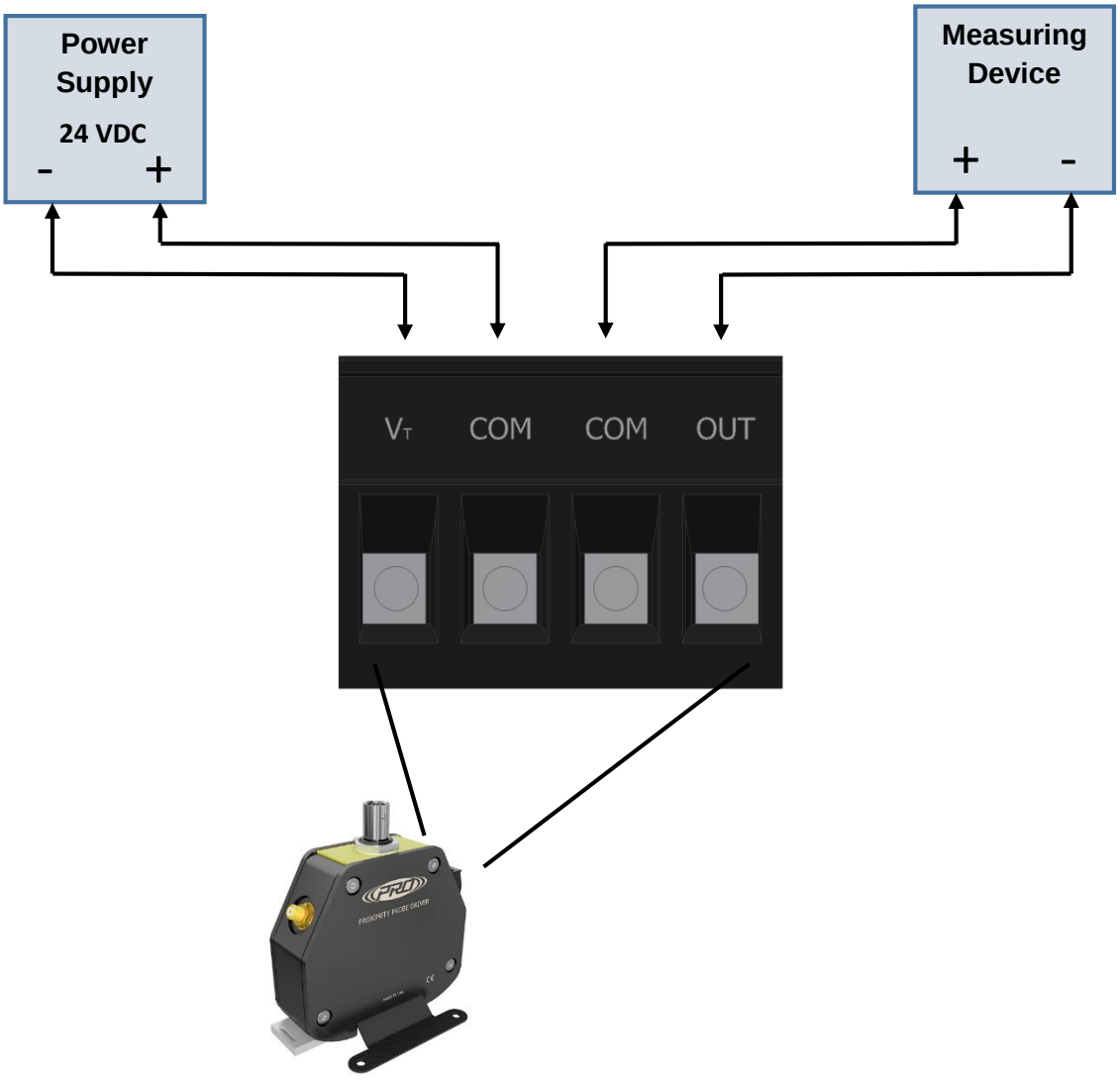

Figure 5 - 4 Wire Connection

NOTE: Wiring Power Supply to COM-COM Terminals Will Damage the Driver

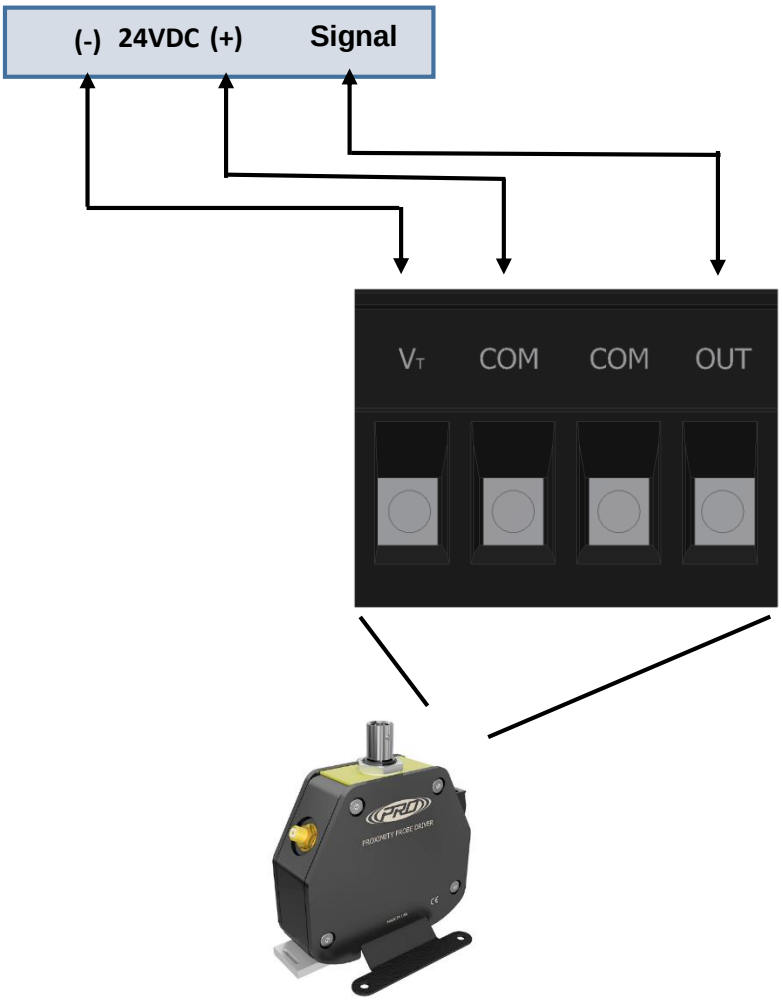

Figure 6 - 3 Wire Connection

NOTE: Wiring Power Supply to COM-COM Terminals Will Damage the Driver

Target Surfaces

The target material directly affects the output from the system. Drivers are calibrated for SAE 4140 steel. If the target material differs from SAE 4140 steel, the output will become non linear

NOTE: Shaft diameters should be uniform in target area, and free of keyways & oil slingers or mechanical damage.

Setup and Adjustment

25mm proximity probes are typically used for measuring differential expansion on steam turbines. This is the measurement of the difference in the rotor expansion and casing expansion.

When all connections to the driver have been made, and the probe is in place, apply power to the system. Adjust the probe until the appropriate output is obtained.

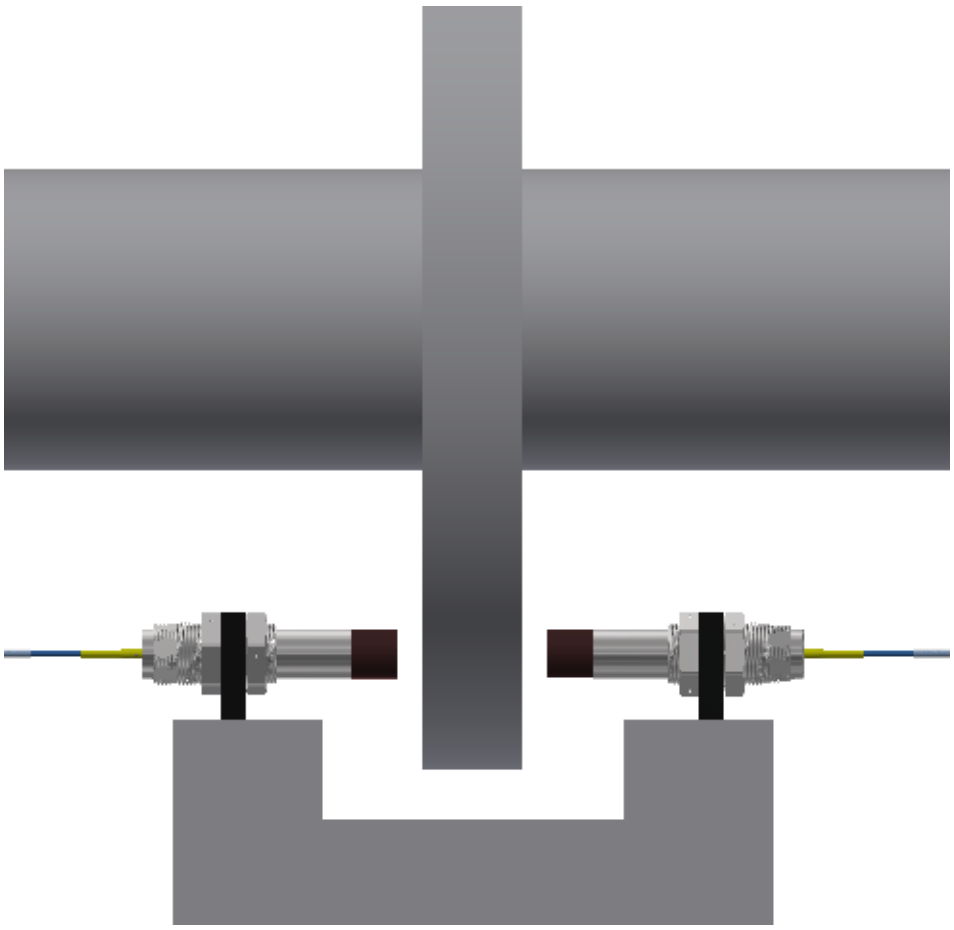

Figure 7 - Differential Expansion

Operation

A PRO DP Probe Assembly operates in combination with a PRO DP Probe Driver. For the Bently™ DX compatible series, the probe assembly can be interchanged with the Bently™ 3300XL Series components. The driver outputs a signal that is proportional to the gap between the probe tip and the target. The average gap corresponds to the DC component of the output. Vibration is measured by monitoring the DC variation of the signal simulating an AC component.

Troubleshooting Chart

Problem	Recommended Action
-0.5 to -0.6 VDC Signal Output	Check Probe Cable / Ext Cable Connection
No Signal Output	Check Power Supply

Note: For specific problem resolution, please call an Applications Engineer at 1-800-999-5290.

Maintenance

Once the proximity probe assembly have been installed, minimal maintenance will be required. Basic visual checks to ensure integrity and proper function should be made periodically.

General

There are no customer replaceable parts. The proximity probe assembly has been designed for trouble-free service under normal operating conditions.

Warranty

PRO will repair or replace any of our products under warranty so long as the product was not subjected to misuse, neglect, natural disasters, improper installation or modification which caused the defect.

Contact Information

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