MANUFACTURER DOCUMENT PACKAGE

# Manufacturer's Manual

Reference package for procurement and maintenance review

BENTLY NEVADA

## 21504-036-068-10-02

**7200 STANDARD MOUNT PROXIMITY PROBE**

Used with the applicable 7200 Proximity Transducer Systems configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

Source: Bently Nevada 7200 Proximity Transducer Systems, 5 mm and 8 mm; original technical/ordering scan, pages 1-9 through 1-12; common 21504 construction only.

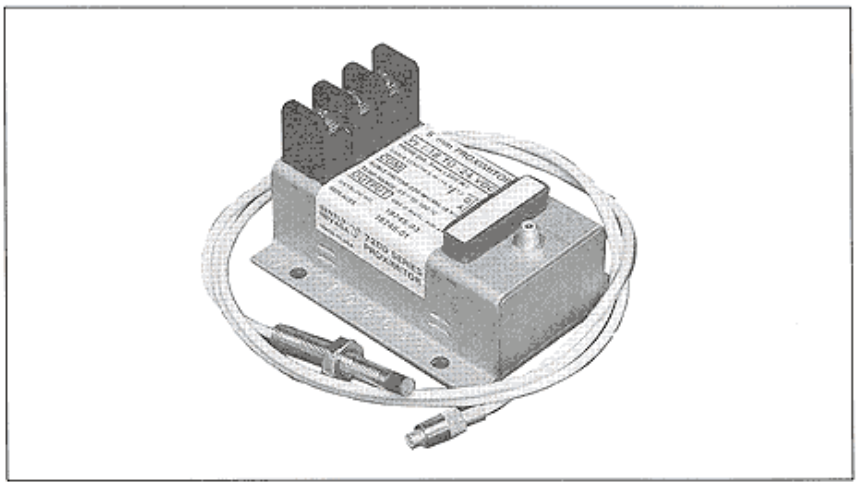
# 7200 Proximity Transducer Systems

*5 mm and 8 mm*

### Accurate, reliable measurements

The 7200 5 mm and 8 mm Proximity Transducer Systems are noncontacting, gap-to-voltage transducer systems that measure static as well as dynamic distances between the probe tip and the observed target. The general application is any requirement for an accurate, noncontacting displacement measurement. However, the most common use is for shaft position and vibration measurements on rotating and reciprocating machinery. They are designed for use with virtually any machine type including gas and steam turbines, compressors, pumps, centrifuges, electric motors and generators. The systems offer 80 mils (2 mm) of linear measuring range and are compatible with API 670 requirements.

A system consists of a probe with integral coaxial cable, an extension cable, and Proximitor®. All 7200 proximity transducer systems are compatible with 3300 and 9000 Monitoring Systems.



*7200 Proximity Transducer System*

### Applications

The 7200 5 and 8 mm Systems have a frequency response of 0 Hz (DC) to 10 kHz and can be used to make the following types of measurements:

- Radial vibration for indicating bearing condition and such machine malfunctions as rotor imbalance and misalignment.
- Axial thrust position for determining thrust bearing wear or potential bearing failure.
- Shaft average radial position, for determining attitude angle, an indicator of rotor stability.
- Vibration amplitude and phase angle for plotting diagnostic information in Polar and Bodé formats.
- Eccentricity to measure the amount of rotor bow.

### How a proximity transducer system works

Operating on the eddy current principle, the proximity probe senses the distance between the probe tip and the observed surface. The Proximitor generates a radio frequency signal, which is radiated through the probe tip into the observed surface. Eddy currents are generated in the surface, and the loss of strength in the return signal is detected by the Proximitor, which conditions the signal for linear display on a monitor.

### Improved proximity probes

An improved 8 mm version of the 7200 System is now standard which includes Bently Nevada's Cable Loc™ feature. This new technique of securing the coaxial cable to the probe tip provides the strongest junction yet offered by Bently Nevada and increases the durability of the probe during installation and usage.

Two new cable length options are now available on 8 mm probes. They are 5 metres and 9 metres of integral cable. Since the entire lead-length is built into the probe, an extension cable is not used with these length options.

Nine probe configurations are available to accommodate English and metric thread requirements (See Table 1). The 5 mm probes are constructed of fiberglass. The 8 mm probes are constructed of polyphenylene sulfide, (PPS), a high performance plastic capable of withstanding unusually harsh, wet and/or chemical environments.

Both transducers are suitable for use in a confined space and offer 80 mils (2 mm) of linear range with a scale factor of 200 mV/mil (8 V/mm).

### Extension cables

The combination of probe with integral lead and extension cable is designed to achieve a system length of either five or nine metres from probe tip to Proximitor. Probes are available with integral leads of various lengths to match the average extension cable lengths. Probes and cables of the same length, and Proximitors with the same part number, are completely interchangeable.

For added protection, stainless steel armor is available. It provides improved resistance to physical abuse.

### Proximitors

The 5 mm and 8 mm systems use the same type of Proximitor. Both 5 and 9 metre Proximitors are available. A three-conductor, shielded cable provides the signal output and power source input between 7200 Proximitors and Bently Nevada monitors. Proximitors can be located up to 1,000 feet from standard Bently Nevada monitors without degradation of performance.

### Hazardous locations

Most Bently Nevada 7200 Transducers are certified by CSA, BASEEFA and FM for use in specific hazardous locations. Refer to Data Sheet L1035 "Bently Nevada Systems for Hazardous Locations" for more details.

# 7200 Proximity Transducer Systems

*5 mm and 8 mm*

5 mm and 8 mm Proximity Probe Configurations

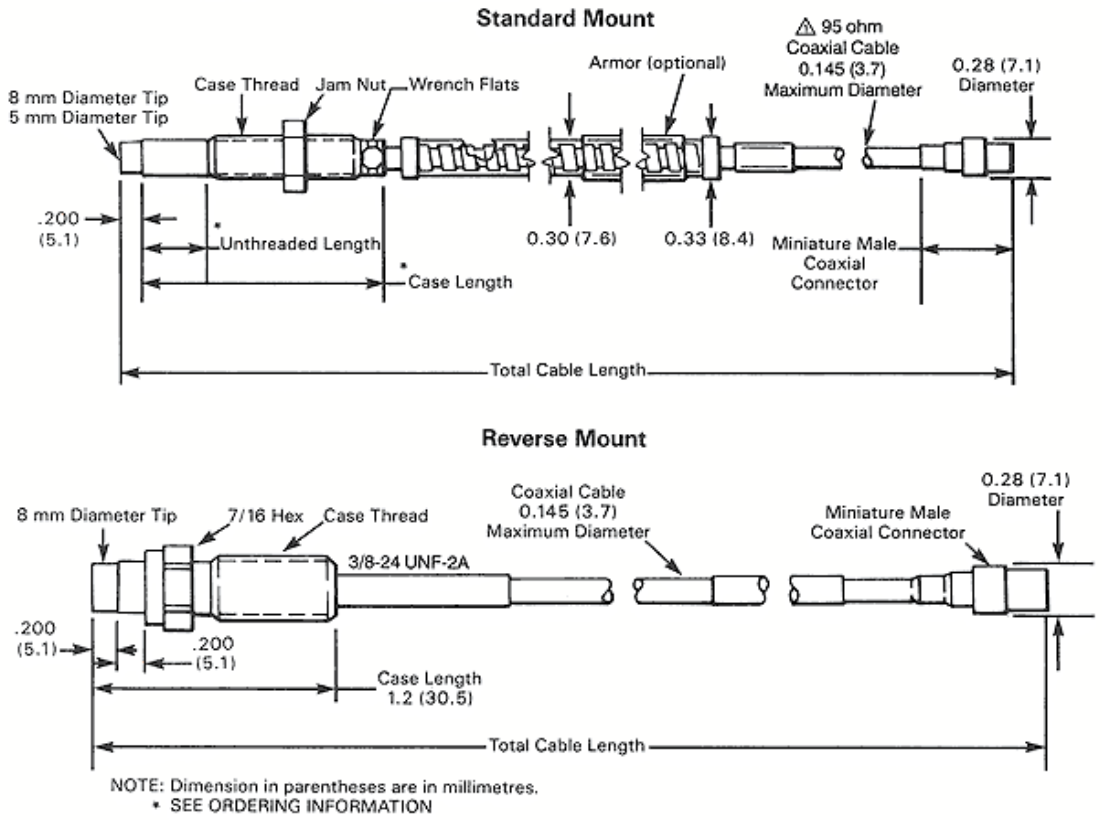



**FIGURE 1**
⚠1 **Maximum diameter for 21500 and 21501 probes is 0.111 in. (3.4 mm).**

## Specifications

Specifications were determined with a –24 Vdc power supply, 10 kΩ load, and an AISI 4140 steel target at +72°F (+22°C).

### INPUT

**Power:** –17.5 Vdc to –26 Vdc at 12 mA maximum consumption.

### OUTPUT

**Calibrated Range:** 80 mils (2.0 mm). Begins at approximately 10 mils (0.25 mm) from probe face.

**Scale Factor:** 200 mV/mil (7.87 V/mm), ±4% (measured in increments of 10 mils over the calibrated range) if calibrated as a system. Within ±9.5% including interchangeability errors.

**Linearity:** Within 0.8 mils (0.02 mm) of a 200 mV/mil straight line if calibrated as a system. Within 2.3 mils (0.06 mm) of a 200 mV/mil straight line including interchangeability errors.

**Frequency Response:** 0 to 10 kHz (0 to 600,000 cpm); –5% at 10 kHz (600,000 cpm).

**Temperature Sensitivity:** Typically –3% change in scale factor at +150°F (+65°C) at 50 mils gap (1.27 mm).

### ENVIRONMENTAL LIMITS

**Operating Temperature:**

**Proximitor:** –60°F to +212°F (–51°C to +100°C).

**Probe and Extension Cable:** –30°F to +350°F (–34°C to +177°C).

**Relative Humidity:** To 95%, noncondensing.

**Corrosion Resistance (for 8 mm probes only):** Probe operation is not affected by direct contact to the following: air, water, lube oil, ammonium hydroxide, sulfuric acid (10%), MEK (methyl-ethylkeytone) or DMF (Dimethylfor-mamide).

**System Weight:** 1.3 lbs.(0.59 kg).

# 7200 Proximity Transducer Systems

*5 mm and 8 mm*

**TABLE 1**
Probe Part Number Option Descriptions

| TIP CONSTRUCTION | | CASE | | |
|---|---|---|---|---|
| PART NO. □□□□ | DIAMETER | CONFIGURATION TYPE | THREADS | LEAD ARMOR |
| *21500- | 5 mm | Standard | 1/4-28 | No |
| *21501- | 5 mm | Standard | 1/4-28 | Yes (stainless steel) |
| 21504- | 8 mm | Standard | 3/8-24 | No |
| 21505- | 8 mm | Standard | 3/8-24 | Yes (stainless steel) |
| 21508-02-12 | 8 mm | Reverse | 3/8-24 | No |
| 22810- | 8 mm | Standard | M10 × 1 | Yes (stainless steel) |
| 22811- | 8 mm | Standard | M10 × 1 | No |
| *22812- | 5 mm | Standard | M8 × 1 | Yes (stainless steel) |
| *22813- | 5 mm | Standard | M8 × 1 | No |

** Maximum case length for all M8 × 1 probes is 100 mm; and for 1/4-28 probes is 4 inches. Also, maximum overall length for 5 mm probes is 1 metre.*

## PHYSICAL

**For Probes:** See Figure 1 and Table 1.

**Proximitor:**

**Size:**

**Height:** 2.00 inches (50.8 mm) maximum.

**Length:** 3.12 inches (79.2 mm).

**Width:** 2.38 inches (60.5 mm).

**Weight:** 7.9 ounces (22.0 kg).

# Ordering Information

### 5 mm and 8 mm Standard Mount Probe

A B C D

□□□□□ - □□ - □□ - □□ - □□

**Option Description**

**□□□□□ Probe Part Number Option**
Select from Table 1.

**A □□ Unthreaded Length Option** ①
Order in increments of 0.4 inches [0|4] for English thread, 10 mm [0|1] for metric threads.

**English thread configurations:**
*Maximum unthreaded length:*
8.8 inches [8|8]

*Minimum unthreaded length:*
0.0 inches [0|0]

**Example:** [0|4] = 0.4 inches

**Metric thread configuration:**
*Maximum unthreaded length:*
230 mm [2|3]

*Minimum unthreaded length:*
0.0 mm [0|0]

**Example:** [0|6] = 60 mm

**B □□ Overall Case Length Option***
Order in increments of 0.4 inches [0|4] for English thread, 10 mm [0|1] for metric threads.

**English thread configurations:**
*Maximum case length:*
9.6 inches [9|6]

*Minimum case length:*
0.8 inches [0|8]

**Example:** [2|4] = 2.4 inches

**Metric thread configuration:**
*Maximum length:*
250 mm [2|5]

*Minimum length:*
20 mm [0|2]

**Example:** [0|4] = 40 mm

**C □□ Total Length Option***
05 0.5 metre (20 inches).
*Tolerance:* +.13 metre, –.05 metre (+5 inches, –2 inches).
10 1.0 metre (39 inches).
*Tolerance:* +.25 metre, –.10 metre (+10 inches, –4 inches).
50 5 metre (195 inches).
*Tolerance:* +.6 metre, –.5 metre (+24 inches, –20 inches).
90 9 metre (351 inches).
*Tolerance:* +1.0 metre, –.9 metre (+39 inches, –35 inches).

**D □□ Connector Option**
00 Without connector.
02 With miniature male coaxial connector.

### 8 mm Reverse Mount Probe

A B C D

21508 - 02 - 12 - □□ - □□

**Option Description**

**C □□ Total Cable Length Option**
05 0.5 metre (20 inches).
*Tolerance:* +.13 metre, –.05 metre (+5 inches, –2 inches).
10 1.0 metre (39 inches).
*Tolerance:* +.25 metre, –.10 metre (+10 inches, –4 inches).
50 5 metre (195 inches).
*Tolerance:* +.6 metre, –.5 metre (+24 inches, –20 inches).
90 9 metre (351 inches).
*Tolerance:* +1.0 metre, –.9 metre (+39 inches, –35 inches).

**D □□ Connector Option**
00 Without connector.
02 With miniature male coaxial connector.

### Extension Cable

A B

21747 - □□□ - □□

**Option Description**

**A □□□ Cable Length Option** ②
040 4.00 metres (157 inches).③
045 4.50 metres (177 inches).③
080 8.00 metres (315 inches).
085 8.50 metres (335 inches).

**B □□ Armor Option**
00 Without armor.
01 With armor.

# 7200 Proximity Transducer Systems
## *5 mm and 8 mm*

**Proximitor**

**18745-□□**

03 For combined probe and extension cable system length of 5 metres (16.4 feet).

04 For combined probe and extension cable system length of 9 metres (29.6 feet).

① *Unthreaded length must be at least 0.8 inches (20 mm) less than case length.*

② *Extension cable physical length equals the electrical length, ± 10%.*

③ *For use with the 18745-03 five-metre Proximitor only.*