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## Описание на датчики положения вращения. Модель RPT

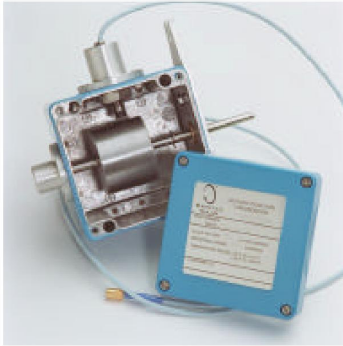


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Nevada

# 3300 XL Rotary Position Transducer (RPT)

## Bently Nevada™ Asset Condition Monitoring

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### Description

The 3300 XL Rotary Position Transducer (RPT) measures angular rotation. Its most common use is for measuring valve position on steam turbines. Valve position information is utilized to adjust inlet valves, determine operating efficiency and measure the load of the turbine.

The 3300 XL RPT attaches to the end of a steam valve control shaft using a flexible coupling (not provided). The 3300 XL Rotary Position Transducer consists of a housing, cylinder and shaft, conduit fitting and a non-contacting eddy-current 3300 XL Proximity Transducer System. The 3300 XL probe views the precisely machined cylinder. As the steam turbine control valve opens or closes, the steam valve control shaft and the 3300 XL RPT cylinder rotate. This causes the gap voltage reading of the Proximity Transducer System to change. The change in the gap voltage is proportional to the change in valve opening.

The 3300 XL RPT is available in three different **rotational** ranges to optimize its performance - 100 degrees, 200 degrees, or 300 degrees. It is compatible with our 3500/45 Position Monitors. The 3500/45 monitor and 3300 XL RPT utilize the advanced "Transducer OK" checking inherent in Bently Nevada eddy current proximity transducer measurements.

## Specifications

Unless otherwise noted, the following specifications are for a 3300 XL Rotary Position Transducer (RPT) between +18°C and +27°C (+64°F to +80°F), with a -24 Vdc power supply and a 10 k Ω load.

### Electrical

#### Power:

Requires -17.5 Vdc to -26 Vdc without barriers at 12 mA maximum consumption.

#### Supply Sensitivity:

Less than 2 mV change in output voltage per volt change in input voltage.

#### Output resistance:

50 Ω

**Table 1. Probe dc resistance (nominal) (R<sub>PROBE</sub>):**

Probe Length	Resistance from the Center Conductor to the Outer Conductor (R <sub>PROBE</sub> ) (ohms)
1.0	7.59 + 0.05
5.0	8.73 + 0.70
9.0	9.87 + 0.90

**Table 2. Extension cable dc resistance (nominal):**

Length of Extension Cable	Resistance from Center Conductor to Center Conductor (R <sub>CORE</sub> ) (°hms)	Resistance from Outer Conductor to Outer Conductor (R <sub>JACKET</sub> ) (°hms)
4.0	0.88 + 0.13	0.26 + 0.05
8.0	1.76 + 0.26	0.53 + 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) [0.25 to 0.75 mm<sup>2</sup> (18 to 23 AWG) with ferrules]. Recommend using three-conductor shielded triad cable. Maximum length of 305

metres (1,000 feet) between the 3300 XL Proximitor® Sensor and the monitor.

#### Average Scale Factor

##### 100° Ramp:

140 ± 8 mV/degrees of shaft rotation.

##### 200° Ramp:

70 ± 4 mV/degrees of shaft rotation.

##### 300° Ramp:

50 ± 3 mV/degrees of shaft rotation.

#### System performance over extended temperatures:

With the Rotary Position Transducer casing and 1 metre of probe cable between the temperature range of -35°C to +120°C (-31°F to +248°F) with the Proximitor® Sensor and extension cable between 0°C to +45°C (+32°F to +113°F), the system output remains within the following specifications:

##### 100° Ramp:

Typical system not more than 0.6%.

##### 200 ° Ramp:

Typical system not more than 0.8%.

##### 300 ° Ramp:

Typical system not more than 1.5%.

#### Electrical Classification

Complies with the European CE mark.

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<b>Mechanical</b>	
<b>Materials</b>	
<b>Probe Tip:</b>	Polyphenylene sulfide (PPS).
<b>Probe Case:</b>	AISI 304 stainless steel (SST).
<b>Probe Cable and Extension Cable:</b>	75 Ω triaxial, fluoroethylene propylene (FEP) insulated cable.
<b>Housing:</b>	Cast aluminum.
<b>Bearings:</b>	Sintered bronze MIL-B-5687A Type, vacuum-impregnated MIL-L-6085.
<b>Ramp:</b>	4140 steel.
<b>Shaft:</b>	303 stainless steel.
<b>Retaining clips:</b>	PH15-7 MO stainless steel.
<b>Probe mounting adapter:</b>	303 stainless steel.
<b>Conduit Fitting:</b>	2024-T4or 2024-T351 aluminum.
<b>Bearing cover:</b>	6061-T6 aluminum.
<b>Mounting plate:</b>	6061-T6 aluminum.
<b>Proximator Sensor:</b>	A308 aluminum.
<b>Connectors:</b>	Gold-plated brass.

<b>Tensile Strength (maximum rated):</b>	330 N (75 lbf) from transducer case to cable. 270 N (60 lbf) at probe lead to extension cable connectors.
<b>Minimum Cable Bend Radius:</b>	25.4 mm (1.0 in).
<b>Total System Weight (typical):</b>	1.8 kg (4.0 lbm)
<b>Rotary position sensor:</b>	1.4 kg (3 lbm)
<b>Extension cable:</b>	37 g/m (0.4oz/ft)
<b>Proximator Sensor:</b>	246 g (8.7 oz)

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<b>Environmental Limit:</b>	
<b>Rotary position sensor and extension cable operating temperature range:</b>	-51° C to+177° C (-60° F to+351° F)
<b>Proximator Sensor operating temperature range:</b>	-35°Cto+85°C(-31°F to +185°F)
<b>Relative Humidity:</b>	100% condensing, non-submersible when connectors are protected.

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## Ordering Information

### 3300 XL Rotary Position Transducer

330165-AXX-BXX-CXX

- A:** System Length and Probe Length Option:
- 50** 5 metre system with 5 metre probe, no extension cable
  - 51** 5 metre system with 1 metre probe, 4 metre extension cable
  - 90** 9 metre system with 9 metre probe, no extension cable
  - 91** 9 metre system with 1 metre probe, 8 metre extension cable
- B:** Proximity Sensor Mounting Option:
- 00** Panel mount
  - 01** DIN mount
  - 02** No mounting hardware
- C:** Rotational Range:
- 01** 100 degree maximum rotational range
  - 02** 200 degree maximum rotational range
  - 03** 300 degree maximum rotational range
- D:** Hazardous Area Approvals:
- 00** Without approvals

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## Accessories

144203

Performance Specification

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## Replacement 3300 XL Proximity Sensor

330180-AXX-00

- 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

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## Replacement 3300 XL Extension Cable

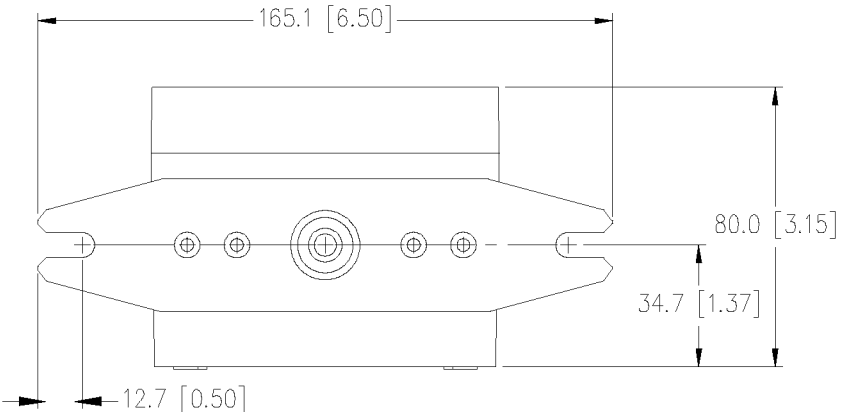
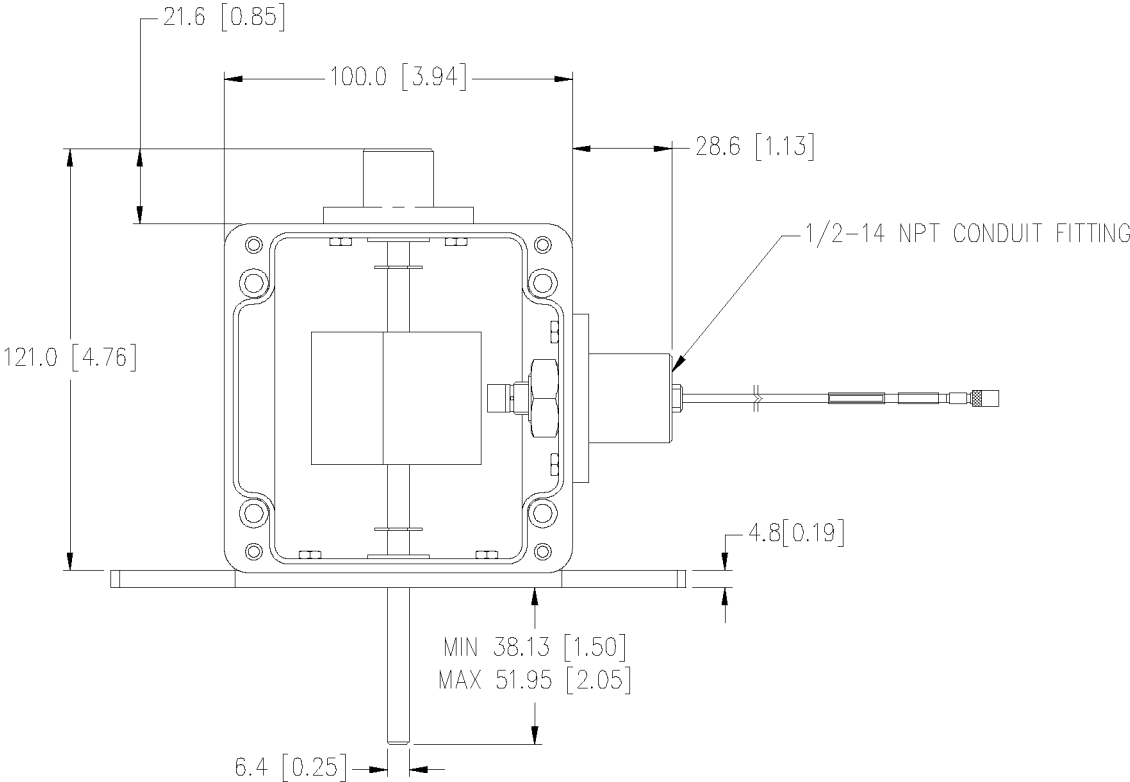
330130-AXXX-00-00

- 040** 4 m (13.1 ft) extension cable
- 080** 8 m (26.2 ft) extension cable

Additional accessories can be found in the following Bently Nevada Specifications Sheets:

- Transducer Accessories (145668-01)
- Connectors (141603-01)
- 3300 XL Proximity Housing (141195-01)
- 3300 XL 8 mm Proximity Transducer System (141194-01)
- Proximity Sensors, Interface Modules, and VDC Housings (141599-01)

Figures



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