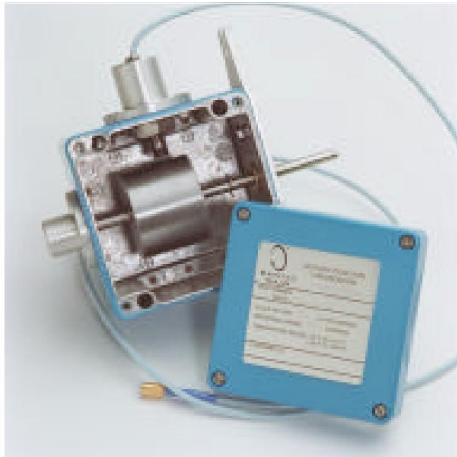


3300 XL Rotary Position Transducer

Datasheet

Bently Nevada Machinery Condition Monitoring

146250 Rev. C



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

Probe dc resistance (nominal)

Probe Length	Resistance from the Center Conductor to the Outer Conductor (Rprobe) (ohms)
1.0	7.59 + 0.05
5.0	8.73 + 0.70
9.0	9.87 + 0.90

Extension cable dc resistance (nominal)

Length of Extension Cable	Resistance from Center Conductor to Center Conductor (RCORE) (ohms)	Resistance from Outer Conductor to Outer Conductor (RJACKET)(ohms)
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 ² (16 to 24 AWG) [0.25 to 0.75 mm ² (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.

Mechanical

Materials

Probe Tip	Polyphenylene sulfide (PPS).
Probe Case	AISI 304 stainless steel (SST).
Probe Cable and Extension Cable	75 Ω triaxial, fluoroethylene propylene (FEP) insulated cable.
Housing	Cast aluminum.
Bearings	Sintered bronze MIL-B-5687A Type, vacuum-impregnated MIL-L-6085.
Ramp	4140 steel.
Shaft	303 stainless steel.
Retaining Clips	PH15-7 MO stainless steel.
Probe Mounting Adapter	303 stainless steel.
Conduit Fitting	2024-T4 or 2024-T351 aluminum.
Bearing Cover	6061-T6 aluminum.
Mounting Plate	6061-T6 aluminum.
Proximitor Sensor	A308 aluminum.
Connectors	Gold-plated brass.
Tensile Strength (maximum rated)	330 N (75 lbf) from transducer case to cable. 270 N (60 lbf) at probe lead to extension cable connectors.
Minimum	25.4 mm (1.0 in).

Cable Bend Radius	
Weight	
Total System (typical)	1.8 kg (4.0 lbm)
Rotary Position Sensor	1.4 kg (3 lbm)
Extension Cable	37 g/m (0.4oz/ft)
Proximito Sensor	246 g (8.7 oz)

Environmental Limit

Rotary Position Sensor and Extension Cable Operating Temperature Range	-51°C to +177° C (-60° F to +351° F)
Proximito Sensor Operating Temperature Range	-35°C to +85°C (-31°F to +185°F)
Relative Humidity	100% condensing, non-submersible when connectors are protected.

Compliance and Certifications

FCC

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

EMC

EN 61000-6-2

EN 61000-6-4

EMC Directive 2014/30/EU

RoHS

RoHS Directive 2011/65/EU

Maritime

ABS 2009 Steel Vessels Rules

1-1-4/7.7,4-8-3/1.11.1,4-9-7/13

Ordering Information



For the detailed listing of country and product specific approvals, refer to the *Approvals Quick Reference Guide* (108M1756) available from Bently.com.

3300 XL Rotary Position Transducer

330165-AA-BB-CC-DD

A: System Length and Probe Length Option

5 0	5 meter system with 5 meter probe, no extension cable
5 1	5 meter system with 1 meter probe, 4 meter extension cable
9 0	9 meter system with 9 meter probe, no extension cable
9 1	9 meter system with 1 meter probe, 8 meter extension cable

B: Proximito Sensor Mounting Option

0 0	Panel mount
0 1	DIN mount
0 2	No mounting hardware

C: Rotational Range

0 1	100 degree maximum rotational range
0 2	200 degree maximum rotational range
0 3	300 degree maximum rotational range

D: Hazardous Area Approvals

0 0	Without approvals
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Accessories

144203	Performance Specification
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Replacement 3300 XL Proximito Sensor

330180-AA-00

A: Total Length and Mounting Option

5 0	5.0 meter (16.4 feet) system length, panel mount
5 1	5.0 meter (16.4 feet) system length, DIN mount

5 2	5.0 meter (16.4 feet) system length, no mounting hardware
9 0	9.0 meters (29.5 feet) system length, panel mount
9 1	9.0 meters (29.5 feet) system length, DIN mount
9 2	9.0 meters (29.5 feet) system length, no mounting hardware

Replacement 3300 XL Extension Cable

330130-AAA-00-00

A: Extention Cable

0 4 0	4 m (13.1 ft) extension cable
0 8 0	8 m (26.2 ft) extension cable

Additional accessories can be found in the following Bently Nevada Datasheets:

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

Graphs and Figures

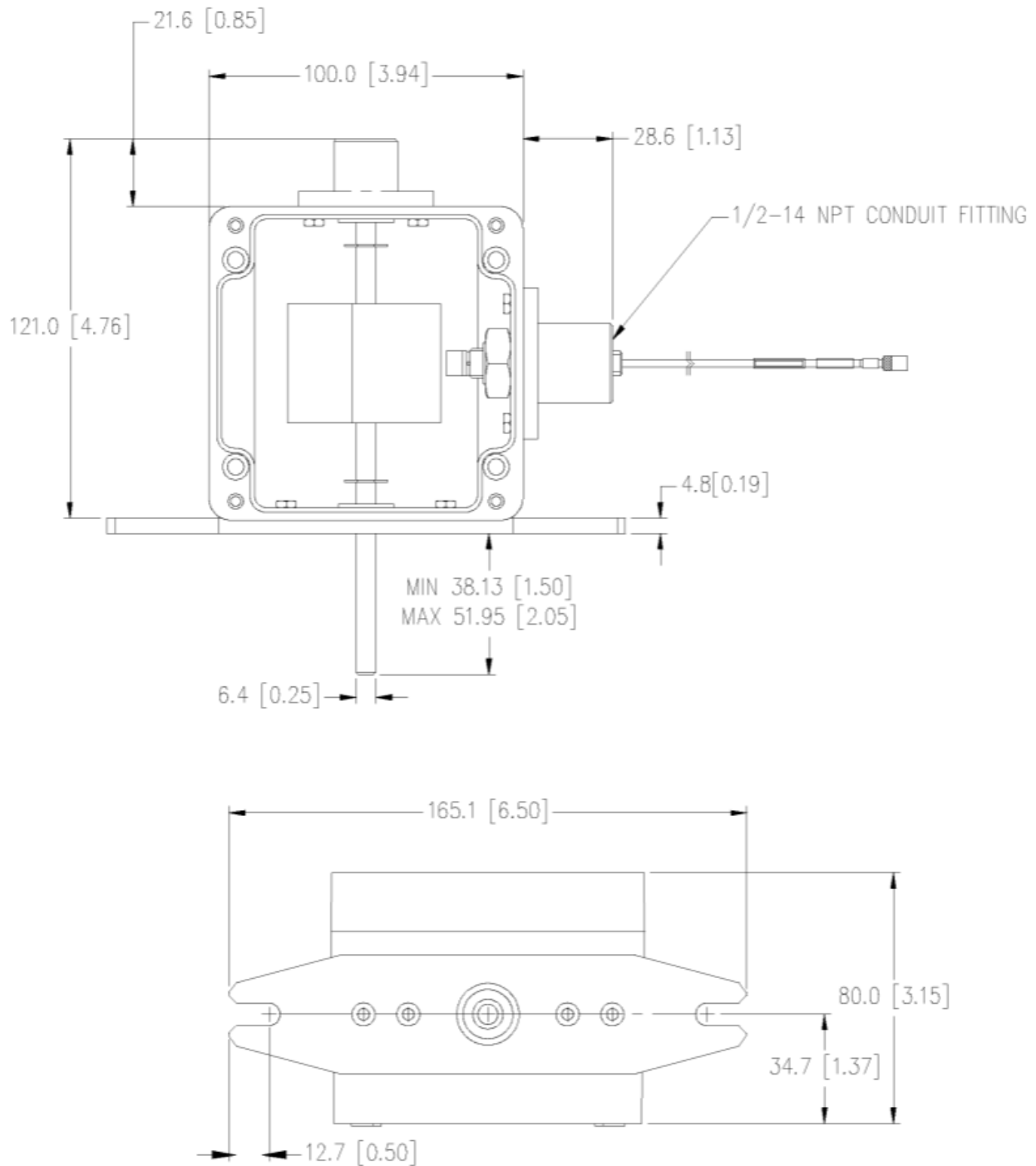


Figure 1: 3300 XL Rotary Position Transducer Dimensions

Shown in millimeters and (inches)

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