Bently Nevada 330173-00-03-10-02-CN

01 A compact probe for constrained positions

Measurement function

The 5 mm sensing package fits restricted spaces, including positions between thrust-bearing pads. Its matched cable and Proximitor convert gap changes into voltage for static position and dynamic vibration measurement.

Selected mechanical and cable construction

Characteristic	Selected value
Sensing tip	5 mm
Mounting thread	M8 x 1
Unthreaded length	0 mm
Overall case length	30 mm
Integral cable length	1.0 m
Probe cable	75 Ω triaxial, FEP insulation
Cable protection	Unarmored
Connection	Miniature coaxial ClickLoc, standard cable

System and material data

Probe case
AISI 303 or 304 stainless steel

Probe tip
PPS

Compatible assembled system lengths
5 m or 9 m, including extension cable

Nominal system scale factor
7.87 V/mm (200 mV/mil), subject to specified system conditions

Typical system linear range
2 mm

Small package, unchanged clearance requirements

Maintain the side-view and tip-to-tip clearances of the 8 mm system. The smaller M8 body does not reduce the electrical clearance needed around the sensing tip.

Performance boundary

A system containing this 3300 5 mm probe is limited to the applicable non-XL 3300 performance. Fitting an XL cable or Proximitor does not make the assembled channel an all-XL 8 mm transducer.

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02 Displacement transfer and temperature

Typical system performance

Characteristic	Value or condition
Linear measurement range	2 mm (80 mils)
Approximate gap interval	0.25 to 2.3 mm
Recommended gap	1.27 mm
Nominal scale factor	7.87 V/mm (200 mV/mil)
Scale-factor tolerance	±6.5% typical, including interchangeability error
Measurement increment	0.25 mm when evaluating the incremental scale factor
Straight-line deviation	Less than ±0.038 mm typical
Probe temperature stability range	-35 to +177 °C
Scale factor over that temperature range	Within ±10% of 7.87 V/mm, typical
Straight-line deviation over that range	Within ±0.076 mm, typical

Conditions for reference measurements

The reference arrangement uses an AISI 4140 steel target, an 18–27 °C system temperature, a -24 V DC supply, a 10 kΩ load and a 1.27 mm gap. Compare calibration results under equivalent conditions rather than treating a probe continuity reading as a displacement calibration.

Temperature and interchangeability are separate effects

The room-temperature incremental scale factor includes the stated interchangeability contribution. The wider probe-temperature range has a different typical performance envelope. Select the appropriate boundary for the actual thermal condition instead of applying the room-temperature figure everywhere.

Voltage conversion example

At nominal sensitivity, 0.25 mm of displacement corresponds to about 1.97 V of output change, calculated from 7.87 V/mm. Actual acceptance must also consider the applicable scale-factor and linearity tolerances and the installed target material.

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03 Conditioner and cable circuit

Electrical characteristics

Item	Value
Proximitor supply	-17.5 to -26 V DC
Maximum consumption	12 mA
Output resistance	50 Ω
Supply sensitivity	Less than 2 mV/V
Reduced-range condition	Supply more positive than -23.5 V
Probe resistance for this 1.0 m lead	7.59 ±0.50 Ω, center to outer conductor
System length	5 m or 9 m including extension cable
Extension cable capacitance	69.9 pF/m typical
Frequency response	0–10 kHz, +0/-3 dB, with up to 305 m field wiring

The extension cable completes the calibrated length

For a five-metre assembly, the one-metre probe is paired with the corresponding four-metre extension and five-metre conditioner. For a nine-metre assembly, the corresponding extension is eight metres. These length sums are selection checks; the actual components must also be compatible with the transducer system.

Field-signal connection

Conductors
Use a shielded three-conductor triad for the conditioned signal.

Conductor size
The recommended range is 16–24 AWG.

Route length
The stated maximum field-wiring length is 305 m.

High-frequency checks
Longer wiring and remote barriers require assessment of signal roll-off.

Do not confuse shield and armor

The outer conductor used for resistance checks is the shielded conductor attached to the connector. It is not an armor braid. This selected probe is unarmored; its cable construction and local mechanical protection must be considered independently.

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04 Mounting, target geometry and environment

Installation data

Condition	Boundary
Recommended case torque	5.1 N·m
Maximum case torque	7.3 N·m
Maximum M8 x 1 thread engagement	12 mm
Maximum connector torque	0.565 N·m
Minimum cable bend radius	25.4 mm
Minimum flat target diameter	15.2 mm
Minimum / recommended shaft diameter	50.8 mm / 76.2 mm
Typical minimum axial / radial tip separation	40 mm / 38 mm
Probe temperature range	-35 to +177 °C

Thread engagement requires its own check

The maximum engagement assumes an internal thread fit corresponding to the external probe thread. A long tapped hole can cause binding even when its nominal diameter and pitch are correct. Compare the engaged length with the 12 mm limit rather than using the 30 mm case length as a thread-engagement allowance.

Oil and sealing considerations

A connector protector can be used for the probe-to-extension joint; silicone tape is not recommended where turbine oil is present. The probe is not pressure-tested before shipment. Establish containment for the application rather than assigning an unsupported pressure rating to the probe.

Cold-temperature seal limitation

Exposure below -34 °C may cause premature pressure-seal failure even though the stated probe temperature range extends to -35 °C. Consider that specific seal limitation when assessing the environment and containment arrangement.

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05 Application decisions and technical questions

Questions for compact installations

Does the 30 mm case of 330173-00-03-10-02-CN permit 30 mm of threaded engagement?
No. Maximum M8 x 1 thread engagement is 12 mm with the matching internal thread fit. Excess engagement can cause binding even though the nominal thread size is correct.

How does probe temperature affect the displacement accuracy of 330173-00-03-10-02-CN?
Across -35 to +177 °C, the typical incremental scale factor remains within ±10% of 7.87 V/mm and straight-line deviation within ±0.076 mm. These limits differ from the room-temperature figures.

Does the smaller sensing body of 330173-00-03-10-02-CN allow closer surrounding metal?
No. The 5 mm package helps with physical mounting space but does not reduce the side-view clearances or tip-separation requirements of the 8 mm system.

What bandwidth can the conditioned signal from 330173-00-03-10-02-CN support over the specified field wiring?
The system frequency response is 0–10 kHz at +0/-3 dB with up to 305 m of field wiring. Longer wiring or remote barriers require assessment of high-frequency signal roll-off.

Before assigning the channel

Decision	Check
Available mounting space	Confirm the M8 case and 30 mm case length suit the measurement location.
Electrical clearance	Check target size, surrounding metal and neighbouring probes.
Performance claim	Use the 5 mm system limits, including the relevant temperature conditions.
Monitor configuration	Set displacement units and sensitivity for the connected transducer chain.

Other transducer catalogue pages

Bently Nevada 330130-075-00-00

Bently Nevada 330703-000-040-10-02-00

Comparison boundary

Related catalogue pages describe other configurations. Compare their probe size, electrical length, mounting and signal-conditioning requirements before considering a substitution.