Bently Nevada 330850-51-05

01 Differential expansion and system role

Bently Nevada 330850-51-05 conditions one matched 3300 XL 25 mm proximity-probe signal in a 5.0 m electrical-length system. This execution uses DIN-rail mounting and SpringLoc field terminals for connection to the monitoring channel.

Rotor collar or ramp	**25 mm probe + cable**	**5 m DIN conditioner**	**Configured DE monitor**

DE geometry and interpretation

Differential expansion concerns the difference between rotor growth and casing growth, rather than a direct reading of temperature. Two probes observing the same side of a sufficiently tall collar provide redundant measurements. Complementary probes observing opposite collar faces can extend the combined measurable travel, while ramp arrangements require compensation for radial movement.

Complete electrical chain

The conditioner calibration belongs to the complete 5 m electrical chain. Compatible probe and extension-cable lengths must add to that total; monitor field wiring is a separate circuit. Upgrading a legacy 7200 or integral DE system requires replacement of the probe, extension cable and conditioner together, even where the output permits the existing monitor configuration to be retained.

Physical verification

Target material, supply voltage, temperature and mechanical alignment affect the usable result. The reference accuracy applies to the specified AISI 4140 target and stated test conditions. A sliding-bracket arrangement allows physical movement to be compared with the indicated displacement during installation and periodic verification; electrical continuity alone cannot establish correct DE measurement.

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02 Signal conditioning and calibration limits

Electrical system length	5.0 m
Mounting	35 mm DIN rail
Probe input	One matched 3300 XL 25 mm probe and extension cable
Supply without barriers	−17.5 to −26 V DC
Supply with barriers	−23 to −26 V DC
Maximum supply current	12 mA
Supply sensitivity	Less than 2 mV output change per 1 V supply change
Nominal system scale factor	0.787 V/mm (20 mV/mil)
System linear span	12.7 mm
Approximate gap interval	0.63–13.33 mm

Displacement-to-signal example

At nominal scale factor, a 2 mm change produces about 1.574 V of output change within the valid linear region. Apply the actual motion direction and calibration instead of treating this as a universal absolute gap voltage.

Reference-condition envelope

The standard specification assumes 0 to +45 °C components, −24 V DC, 10 kΩ load, a suitable AISI 4140 target and a 7 mm gap. Broad component operating limits are not equivalent to this accuracy envelope.

Can a high-temperature probe justify installing 330850-51-05 in the same hot environment?

No. The conditioner’s operating limit is separate from the probe and extension cable limits. Verify cabinet ambient and local heating at the conditioner, as well as the transducer conditions near the machine.

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03 Environmental and field-circuit design

Approximate output interval	−1.5 to −11.5 V DC
Reference DSL	Less than ±0.31 mm under stated reference conditions
Typical frequency response	DC–2.7 kHz, +0/−3 dB with up to 305 m field wiring
Recommended flat-target diameter	61 mm minimum
Field conductor range	0.2–1.5 mm²; 0.25–0.75 mm² with ferrules
Field wiring recommendation	Three-conductor shielded triad
Sensor operating temperature	−51 to +100 °C
Sensor storage temperature	−51 to +105 °C
Conditioner housing	A380 aluminum
Relative humidity	100% condensing, non-submersible with protected connectors

Electrical-length example

A compatible 1 m probe plus a 4 m extension cable supplies the 5 m chain. The separate field cable to the monitor is not added to that calibrated length.

Extended-temperature interpretation

The stated ±0.92 mm DSL conditions vary probe temperature separately from conditioner/cable temperature. They cannot be combined into an unrestricted all-components-extreme accuracy guarantee.

What additional result should a sliding-bracket test demonstrate for 330850-51-05?

Compare measured physical carriage movement with the complete monitor indication and intended direction. Keep the transducer aligned and perpendicular to the target; continuity or a single gap voltage does not prove the full measurement path.

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04 Target geometry and conversion boundaries

Same-side collar measurement

Use two suitably positioned transducers for redundant DE measurements when collar height permits.

Complementary collar measurement

Configure opposite-face measurements to extend combined travel while preserving each channel’s valid range.

Ramp-based DE measurement

Use the correct ramp geometry and a second measurement to compensate for radial movement.

Legacy DE-system conversion

Replace probe, extension cable and conditioner together when converting a compatible older system.

Supply headroom

Operation at a voltage more positive than −23.5 V DC can reduce linear range, even when the supply remains inside the broad operating interval.

Temperature boundaries

The conditioner has a different temperature envelope from the probe and extension cable. Probe heat capability must not be transferred to cabinet electronics.

Upgrade boundary

An unchanged monitor scaling arrangement does not justify mixing legacy and 3300 XL 25 mm transducer components.

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05 Engineering review before replacement

Lifecycle and replacement scope

The manufacturing and support phase of 330850-51-05 is unconfirmed. Continued use requires a compatible 25 mm measurement chain and a supported monitoring arrangement. Review replacement as part of the complete probe, extension cable and conditioner chain. An upgrade from a 7200 or integral DE system requires all three components to change to the 3300 XL 25 mm design.

Why can 330850-51-05 lose useful travel even when its supply is within the operating interval?

A terminal voltage more positive than −23.5 V DC can reduce linear range. Measure the actual loaded voltage after wiring and barrier drops, then verify output over the required physical travel.

Can an older probe remain in use when 330850-51-05 replaces a legacy DE conditioner?

A conversion from a 7200 or integral DE system requires the probe, cable and conditioner to become a complete 3300 XL 25 mm chain. Matching output scaling does not establish component interchangeability.

Technical basis

Bently Nevada 3300 XL 25 mm Proximity Transducer System, 163236 Rev. M. Values describe the matched 25 mm probe, cable and conditioner. Reference conditions are 0 to +45 °C, −24 V DC, 10 kΩ load, an AISI 4140 steel target at least 61 mm across and a 7.0 mm gap; individual limits are identified separately.

Other Bently Nevada product references

Bently Nevada 330101-00-30-10-01-00

Bently Nevada 330101-00-30-90-02-05

Bently Nevada 330101-00-55-05-11-00

Separate product references; no substitution or compatibility is implied.