Bently Nevada 177230-02-01-05

01 Two measurements from one machine point

Bently Nevada 177230-02-01-05 provides a 4–20 mA measurement of broadband RMS casing-vibration velocity over 0–50.8 mm/s. A separate dynamic acceleration output supports verification and vibration analysis.

Machine casing	Ceramic shear sensor	RMS current loop	Plant analog input

Loop measurement

The selected configuration measures broadband RMS velocity from 10 Hz to 1 kHz. Its current output represents overall vibration severity rather than a frequency spectrum. A receiving analog channel must use the selected full-scale velocity and the live-zero current relationship to convert the signal into engineering units.

Shared signal reference

Pins A and B carry the current loop. Pin C provides unbuffered dynamic acceleration relative to pin B, so the waveform output cannot be treated as an independent grounded instrument connection. Grounding pin B can short the current loop and remove its output; assess the reference and isolation of any connected analyzer before making the measurement.

Mechanical measurement path

The transmitter mounts directly to the machine through a stud and uses a ceramic shear sensing element. Mounting quality and the selected measurement location affect the transmitted vibration. Allow the output to settle after energization, then compare the loop value and a suitable independent vibration measurement under a controlled machine condition.

Bently Nevada 177230-02-01-05

02 Velocity-loop interpretation

Velocity full scale	50.8 mm/s RMS; 2.0 in/s RMS
Velocity frequency response	10 Hz–1 kHz, ±10%
Velocity output	4–20 mA, pins A–B
Excitation voltage	12–30 V DC; current limited to 40 mA
Settling time	Less than 15 s, within 2% of final value
Dynamic output	Unbuffered acceleration, pins C–B
Acceleration sensitivity	100 mV/g, ±20%
Acceleration full scale	15 g peak
Acceleration frequency response	2.5 Hz–10 kHz, ±10%
Dynamic output bias	2.5 V ±0.1 V relative to pin B

A nominal scaling example

The 16 mA measurement span represents 50.8 mm/s RMS, giving 3.175 mm/s per mA above the 4 mA live zero. At 8 mA, the nominal reading is therefore 12.7 mm/s RMS; this arithmetic does not remove sensor and input-channel tolerances.

Different outputs, different bandwidths

The velocity loop covers the selected 10 Hz–1 kHz band, while the dynamic acceleration path covers 2.5 Hz–10 kHz. They are not interchangeable numerical channels, even when both are responding to the same machine.

Bently Nevada 177230-02-01-05

03 Dynamic signal and installation limits

Dynamic linearity	±1% of full scale
Transverse sensitivity	Less than 5%
Mounted resonance	Greater than 12 kHz
Sensing element	Ceramic shear
Operating temperature	−40 to +85 °C; hazardous-area limits may be lower
Case material	316L stainless steel
Connector	3-pin MIL-C-5015
Mounting torque	4–7 N·m
Environmental sealing	Hermetic; to 100% RH, non-submerged

Ground reference matters

An analyzer with an earth-referenced common can alter the loop when connected to pin B. Review the complete grounding arrangement instead of assuming that a physically separate signal pin is electrically isolated.

Mechanical repeatability

A loose or altered mounting contact changes the vibration path into the sensor. Preserve location, orientation and mounting method when comparing before-and-after measurements.

Bently Nevada 177230-02-01-05

04 Monitoring and diagnostic uses

Casing-vibration trends

Trend the selected broadband RMS velocity on a correctly scaled plant analog input.

Control-system vibration supervision

Use the measured velocity within an engineered monitoring function whose alarm logic and response are defined by the plant application.

Waveform verification

Connect a suitable isolated measurement instrument to the dynamic output without grounding the shared return.

Machine-mounted sensing

Use the stud-mounted transducer at an appropriate machine measurement location and retain a reproducible mounting condition for comparative readings.

Loop scaling

For the nominal selected range, velocity equals (current in mA minus 4) × 50.8 / 16. Apply this only within the intended normal measurement range.

RMS versus peak

The selected 01 frequency option is RMS. Do not compare its velocity value directly with a peak-valued instrument without accounting for waveform characteristics.

Analyzer connection

The dynamic signal is unbuffered and shares pin B with the loop. Verify instrument compatibility and reference isolation before connection.

Bently Nevada 177230-02-01-05

05 Technical decisions before replacement

Lifecycle and replacement scope

The manufacturing and support phase of this complete reference is unconfirmed. Retain the exact ordered configuration when assessing an installed-system replacement. Compare the full marking and actual measurement arrangement before selecting a replacement or changing the signal path.

What velocity should a nominal 12 mA signal from 177230-02-01-05 represent?

12 mA is halfway across the 4–20 mA span, corresponding to 25.4 mm/s RMS for this range. Check the receiving channel’s scaling and units before treating a mismatch as a sensor fault.

Why can connecting an analyzer to 177230-02-01-05 make its current output disappear?

The dynamic signal uses pin B as its reference, and grounding that terminal can short the current loop. Check the analyzer’s input reference and isolation before reconnecting; do not assume its common is floating.

Technical basis

Bently Nevada 177230 Seismic Transmitter datasheet, 177232 Rev. U. Hardware and ordered configuration apply to 177230-02-01-05; system-level values require the stated connected equipment and calibration conditions.

Other Bently Nevada product references

Bently Nevada 330101-00-15-05-11-00

Bently Nevada 330101-00-25-05-11-00

Bently Nevada 330101-00-26-05-01-05

Separate product references; no substitution or compatibility is implied.