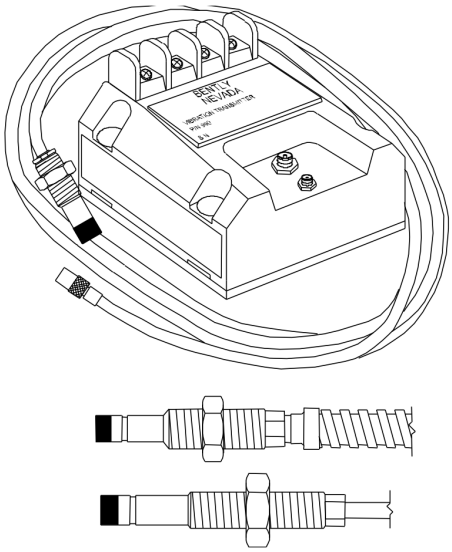
990 Vibration Transmitter

Datasheet

Bently Nevada Machinery Condition Monitoring

141612 Rev. V



Description

The 990 Vibration Transmitter is intended primarily for the original equipment manufacturers (OEMs) of centrifugal air compressors or small pumps, motors, or fans who prefer to provide a simple 4 to 20 mA proportional vibration signal as the input to their machinery control system.

The transmitter is a two-wire, loop-powered device that accepts input from our 3300 NSv proximity probe and its matching extension cable (available in 5 m and 7 m system length options).

The transmitter conditions the signal into appropriate peak-to-peak vibration amplitude engineering units, and provides this value as a proportional 4 to 20 mA industry-standard signal as the input to the control system where machinery protection alarming and logic occurs†.

The 990 transmitter provides the following notable features:

- Integrated Proximitor Sensor requires no external unit
- Non-isolated "PROX OUT" and "COM" terminals plus a coaxial connector to provide a dynamic vibration and gap voltage signal output for diagnostics‡.
- Non-interacting zero and span potentiometers under the Transmitter label supports loop adjustment.
- Test Input pin for quick verification of loop signal output, using a function generator as the input.
- A Not OK/Signal Defeat circuit prevents high outputs or false alarms due to a faulty proximity probe or loose connection.
- Choice of DIN-rail clips or bulkhead mounting screws as standard options simplifies mounting.

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- Potted construction for high humidity (up to 100% condensing) environments. Compatibility with 3300 NSv proximity probe allows transducer installation in small areas with minimal clearance, typical of centrifugal air compressors.

Notes

† Vibration transmitters have many limitations when compared to a continuous vibration monitoring system. They are a practical solution in some applications for measuring general vibration levels and are a valuable tool for overall vibration trending. However, they provide limited capability for machinery diagnostics using the vibration signal and do not capture dynamic vibration signals (used for diagnostics) in the event of a vibration alarm. While the transmitter is capable of peak vibration alarming and non-OK checking, the 4-20 mA signal cannot be used to determine the phase of vibration, and monitor functions such as gap alarms, phase alarms, Timed OK channel defeat, Danger Bypass, and Trip Multiply cannot be used. In addition, PLCs attached to the vibration transmitter can only provide peak-to-peak trending data and are not suitable for plant-wide diagnostic systems such as System 1 or Rule Paks.

‡ The 990 Vibration Transmitter's "Prox Out" coaxial connector provides a non-isolated dynamic transducer signal for machinery diagnostics. You can connect this signal directly to battery-powered or isolated test equipment to diagnose machinery problems. However, since the "PROX OUT" signal is not isolated from the 4 to 20 mA loop signal, an interface is available (and strongly recommended) for signal isolation. The 990/991 Test Adapter conditions the 990 Transmitter's "PROX OUT" signal for use with ac-powered test equipment. It also inverts and isolates the 990's transducer signal, making it suitable for equipment such as oscilloscopes and analyzers, and preserving industry-standard conventions for signal polarity. We strongly recommend the use of this test adapter for all applications to maintain isolation between test equipment and the loop signal, and ensure that the installation maintains machinery protection integrity.

Accessories

122115-01	990/991 Test Adapter. Package includes: 990/991 Test Adapter, 9V battery, Universal AC Adapter, Power Cord (North American), User Guide and Soft Carrying Case. The 990/991 Test Adapter inverts and isolates the PROX OUT signal from the 990 Transmitter so that you can connect 990 Transmitters to AC-powered diagnostic equipment. The Adapter modifies the PROX OUT signal so that it matches our standard Proximitor sensor signals by performing these functions: • Shifts the phase of the PROX OUT signal by 180° by changing the voltage from positive to negative • Shifts the phase of the PROX OUT signal by 180° by changing the voltage from positive to negative • Shifts the phase of the PROX OUT signal by 180° by changing the voltage from positive to negative The 990/991 Test Adapter provides the following benefits: • Small size and weight for portable operation • Battery or AC adapter power options • Automatic shutoff circuit that powers down the unit when the battery is low • 2 channels, so that you can display an orbit for XY probe configurations.

990/991 Test Adapter Accessories

123266-01	Coaxial Cable Kit. Includes 4 cables with length of 1.5 meters (5 feet) each.
02211505	Single coaxial cable with length of 1.5 meters (5 feet).

990/991 Test Adapter Spare Parts

01810700	Battery (9 volt alkaline).
02270056	AC adapter. Has universal AC input to 9 volts DC output. Input is 108 to 132 Vac with 120 Vac nominal, or 207 to 253 Vac with 240 Vac nominal.
02198937	Power cord (for North American AC power outlet).
123133	990 Test Adapter User Guide

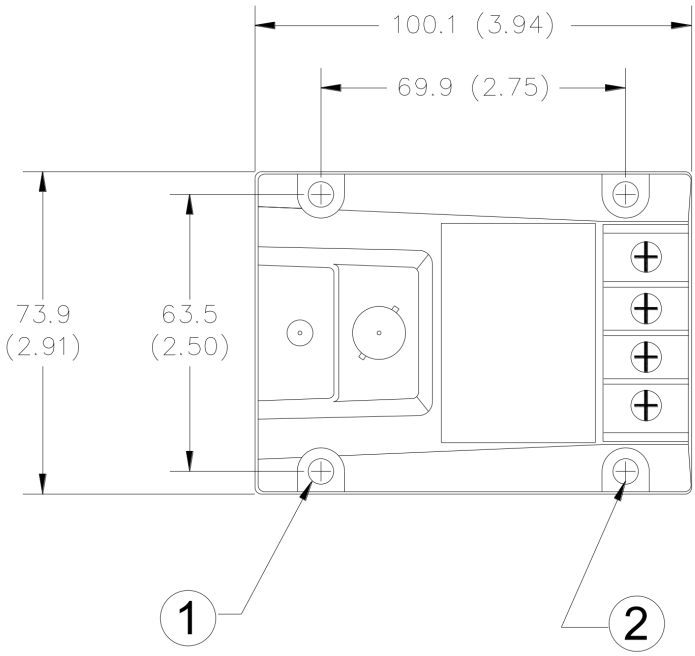
Probe and Transmitter Accessories

02173006	Bulk cable (specify length in feet). 1.0 mm^2 (18 AWG), 2-conductor, twisted, shielded cable used for the 4 to 20 mA loop. Also used for the PROX OUT signal on the 990 Transmitter's terminal strip.
123655	990/991 Transmitter System Installation User Guide
330153-05	Cable Connector Kit. Package Includes 1 set of 75 Ω miniature male and female connectors, shrink tubing and 3300 Isolator Seal for protection of coaxial connectors.
163356	Connector Crimp Tool Kit. Includes one set of 75 Ω ClickLoc inserts and connector installation instructions. Supplied with carrying case.

330951-01	990 Mounting Screws (spares). Contains 4 screws.
284726	DIN rail mounting kit. Installed on the 990 Transmitter to allow mounting on 35 mm DIN rail.

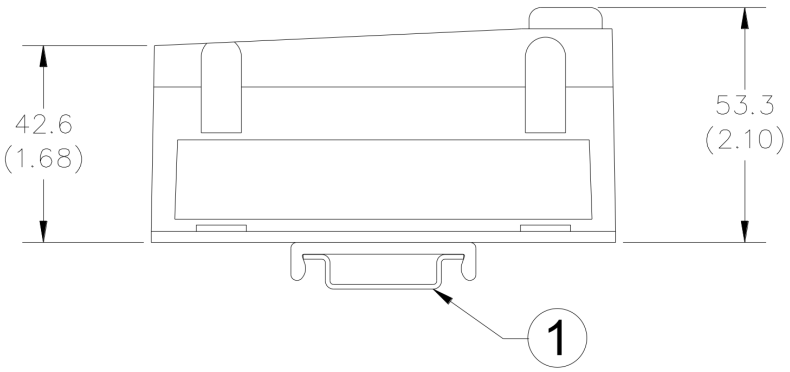
Graphs and Figures

All dimensions shown in millimeters (inches) unless noted otherwise



1. Mounting holes, 5.8 mm (0.23 in) diameter, 4 places
2. Bulkhead mount holes, 4 each. 6-32 x 1.326 screws provided when mounting option specified

Figure 1: 990 Vibration Transmitter Dimensions (top view)



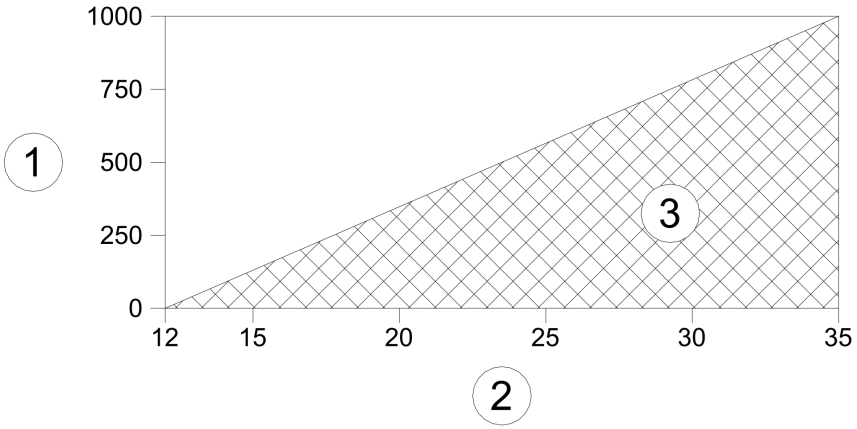
1. 35mm DIN rail DIN mount clips (when DIN rail mounting is specified)

Figure 2: 990 Vibration Transmitter Dimensions (side view)

2. Receiver
3. Cable shield
4. Transmitter
5. Extension cable
6. Recommended wiring is shielded, twisted-pair, 1.0 mm (18 AWG) (part number 02173006). Maximum length is 13 km (8 miles).
7. Power supply, V_{PS} = 17 to 35 Vdc
8. Common (ground)
9. Probe

Figure 7: 990 Vibration Transmitter Loop Wiring Connections

The phase of the PROX OUT signal is inverted from the standard for Bently Nevada products. Also, connecting grounded AC-powered equipment to PROX OUT may result in a false alarm. Use test adapter 122115-01 to connect AC equipment to the transmitter. Note that the 122115-01 also inverts the PROX OUT signal.



1. Maximum loop resistance in ohms (R_{LOOP})
2. Power supply voltage (V_{PS})
3. Operating region

Figure 8: 990 Vibration Transmitter Maximum Loop Resistance

RLOOP = 43.5 x (Vps – 12) W maximum. If the maximum loop resistance is exceeded, then the full-scale current does not reach 20 mA.