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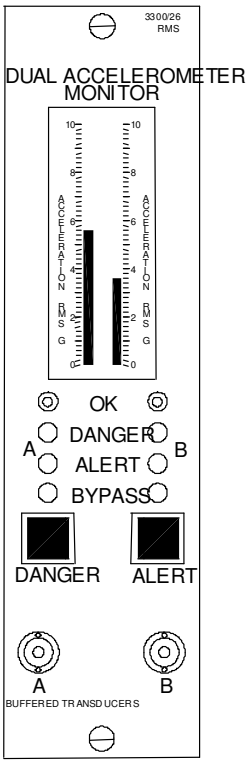
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Find the *GE / Bently Nevada 3300/26-XX-XX-XX-01-00-03-00* at our website: *Click HERE*

3300/26 Dual Accelerometer RMS Monitor

Bently Nevada™ Asset Condition Monitoring



Description

The Dual Accelerometer RMS Monitor measures absolute machine housing or structural vibration relative to free space (seismic), and provides two independent channels of on-line machine vibration monitoring using Root Mean Square (RMS) signal conditioning and display capabilities. It provides over 10,000 high-pass and low-pass filter combinations. These filter combinations can be easily changed in the field by using plug-in jumpers.

Specific recommendations:

- For virtually all machinery with fluid film bearings, the primary measurement should be shaft relative vibration, using a probe and Proximitor®.
- If particular machinery with fluid film bearings produce vibrations which are (a) not adequately detected by shaft relative displacement and (b) these vibrations are transmitted sufficiently to the bearing housing, then accelerometer measurements can be used to supplement shaft relative measurements.

⚠ Caution

If housing measurements are being made for overall protection of the machine, thought should be given to the usefulness of the measurement for each application. Most common machine malfunctions (imbalance, misalignment, etc.) originate at the rotor and cause an increase (or at least a change) in rotor vibration. In order for any housing measurement alone to be effective for overall machine protection, a significant amount of rotor vibration must be faithfully transmitted to the bearing housing or machine casing, or more specifically, to the mounting location of the transducer.

In addition, care should be exercised in the physical installation of the transducer. Improper installation can result in a decrease of the transducer amplitude and frequency response and/or the generation of signals which do not represent actual machine vibration.

Upon request, we can provide engineering services to determine the appropriateness of housing measurements for the machine in question, and/or to provide installation assistance.

Note: Many high-pass and low-pass filter combinations are incompatible. For optimum monitor system performance, good engineering judgment must be used in conjunction with sound knowledge of the actual dynamics of the machine and transducer characteristics in order to select the proper filter options. For virtually all accelerometer applications, it is generally recommended to use a low-pass filter in order to eliminate the effects of the transducer's mounted resonance. A high-pass filter may be required to compensate for undesirable low frequency noise. This is especially useful for integrated acceleration (velocity) channels. A high-pass filter can reduce the effects of high gain at low frequencies caused by electronic integration.

Specifications

Inputs

Signal:

Accepts one or two acceleration transducer signals. Depending on full-scale range options selected, Bently Nevada's standard Acceleration Interface Modules 23733-03 or 49578-01,

High Frequency Interface Module 24145-02 or 155023-01, or the 330400 or 330425 Accelerometer Transducer may be used.

Sensitivity

Interface modules 23733-03 and 24145-02:

100 mV/g (10 mV per m/s^2)

or

330400 Accelerometer Transducer:

100 mV/g (10 mV per m/s^2)

Interface Modules 49578-01 and 155023-01:

25 mV/g (2.5 mV per m/s^2)

or

330425 Accelerometer Transducer:

25 mV/g (2.5 mV per m/s^2)

Power:

Nominal consumption of 3 watts (excluding accelerometers).

Note: Due to power consumption requirements for the accelerometers, no more than eight 3300/26 monitors should be used in a single rack.

Signal Conditioning

Frequency Response:

Without Filter: 2.7 Hz to 60 kHz; -3 dB nominal.

Frequency range with integration 10 Hz to 60 kHz.

Filter Corner Frequencies:

High-pass can be selected from one of 499 frequencies, from 3.7 to 3008 Hz (222 to 180,480 cpm).

Low-pass can be selected from one of at least 384 frequencies, within a range of 24 to 22,372 Hz (1440 to 1,342,320 cpm).

Filter Quality:

High-pass 4-pole (80 dB per decade, 24 dB per octave).

Low-pass. At least, 7-pole (140 dB per decade, 42 dB per octave).

Integration:

Integration can be user-selected per channel. An accelerometer signal with a scale factor of 100 mV/g (10 mV(per m/s^2)) results in a signal scale factor of 500 mV(in/sec) (20 mV/(mm/s)) after integration. An accelerometer signal with a scale factor of 25 mV/g (2.5 mV(per m/s^2)) results in 125 mV/(in/sec)

(5 mV(mm/sec)) after integration. Full scale may not be attainable at high frequencies.

Accuracy:

Within ±0.33% of full-scale typical,

- ±1% maximum
- ±2% maximum with 2X Trip Multiply
- ±3% maximum with 3X Trip Multiply.

All specified at +25° C (+77° F) without filters or integration.

Outputs

Recorder:

User-programmable for +4 to +20 mA, 0 to -10 Vdc, or +1 to +5 Vdc. Voltage or current outputs are pro-portional to programmed monitor full-scale. Individual recorder out-puts are provided for each channel. Monitor operation is unaffected by short circuits on recorder outputs.

Recorder accuracy (in addition to signal conditioning accuracy) at +25° C (+77° F):

- **+4 to +20 mA:** ±0.7% of signal, ±0.24 mA offset.
- **+1 to +5 Vdc:** ±1.1% of signal, ±40 mV offset.
- **0 to -10 Vdc:** ±1.1% of signal, ±105 mV offset

Output Impedance (voltage outputs):

100 Ω. Minimum load resistance is 10 k Ω.

Voltage Compliance (current outputs):

0 to +12 Vdc range across load. Load resistance is 0 to 600 ohms when using +4 to +20 mA option.

Buffered Transducer Outputs:

One coaxial connector per channel on front panel and one terminal connection per channel on rear panel. All are short circuit protected. Output jumper-programmable for filtered or unfiltered.

Buffered Transducer Out Accuracy (no integration, no filters, unity gain, no TM):

± 3% of signal, less than 19 mV offset, specified at +25° C (+77° F).

Output Impedance:

100 ohms.

Accelerometer Interface Module Supply Voltage:

-24 Vdc. Current limited on individual monitor circuit boards.

Note: Due to power consumption require-ments for the accelerometers, no more than eight 3300/26 monitors should be used in a single rack.

Alarms

Alarm Setpoints:

Both alarms (Alert and Danger) are digitally adjustable from 0 to 100% of full-scale and can be set within LCD resolution (±1.6%) to desired level. Once set, alarms are repeat-able within ± 0.39% of full-scale.

Relay Modules

Location:

One alarm relay module can be installed behind each monitor. At least one relay module must be ordered with each 3300 System.

Display

Meter:

Nonmultiplexing vertical bargraph type Liquid Crystal Display (LCD). Individual 63 segment LCD per channel. LCD also displays error codes and monitor ADJUST mode.

Resolution:

Within ±1.6% of monitor full-scale.

Size:

83 mm (3.2 in), vertical dimension.

LED Indicators

OK:

One constant ON green LED per channel indicates OK condition of monitor, transducers and field wiring. Constant OFF indicates NOT OK condition or Channel Bypassed (red Bypass LED will be ON). OK LED flashing at 1 Hz indicates channel has been NOT OK but is now OK (if Timed OK/Channel Defeat is programmed). OK LED flashing at 5 Hz indicates error code(s) stored in memory.

Alarm:

Two red LEDs per channel indicate alarm status (individually for Alert and Danger). Flashing alarm LED indicates First Out (independent for Alert and Danger).

Bypass:

Two red LEDs indicate status of Danger Bypass and Rack/Channel Bypass functions (individually per channel). LEDs flash when monitor is in Trip Multiply mode.

Environmental Limits

Operating Temperature:

0°C to +65°C (+32°F to +150°F).

Storage Temperature:

-40°C to +85°C (-40°F to +185°F).

Relative Humidity:

To 95%, non-condensing.

CE Mark Directives

EMC Directive

Certificate of Conformity: 158710

Low Voltage Directive

Certificate of Conformity: 135300

Hazardous Area Approvals

CSA/NRTL/C

Class I, Div 2

Groups A, B, C, D

T4 @ Ta = +65 °C

Certification Number

150368 – 1002151 (LR 26744)

ATEX

 II 3 G

EEx nC[L] IIC

T4 @ Ta = -20°C to +60°C

When installed per document number 132577-01.

Certification Number

BN26744C-55A

Physical

Space Requirements:

One rack position (any position except 1 and 2, which are reserved for Power Supply and System Monitor, respectively).

Weight:

1 kg (2.2 lbs.).

Ordering Information

For spares, order the complete catalog number as described below. This includes a front panel assembly, monitor PWAs with sheet metal, and appropriate relay module. This unit is optioned, tested and ready to install in your system. Spare relay modules can be ordered separately.

Dual Accelerometer RMS Monitor

3300/26-AXX-BXX-CXX-DXX-EXX-FXX-GXX

Option Descriptions

A: Transducer Input / Channel Units Option

0 1	Dual accelerometer inputs; both channels indicate in acceleration units
0 2	Dual accelerometer inputs; Channel A indicates in acceleration units, Channel B indicates in velocity units
0 3	Dual accelerometer inputs; both channels indicate in velocity units
0 4	Single accelerometer inputs; both channels indicate in acceleration units
0 5	Single accelerometer inputs; Channel A indicates in acceleration units, Channel B indicates in velocity units
0 6	Single accelerometer inputs; both channels indicate in velocity units

B: Channel A Full-scale Range Option

0 1	0-2 gs rms
0 2	0-5 gs rms
0 3	0-10 gs rms
0 4	0-20 gs rms
0 5	0-25 gs rms
0 6	0-40 gs rms
0 7	0-50 gs rms
0 8	0-1 in/sec rms
0 9	0-2 in/sec rms
1 1	0-20 m/s^2 rms
1 2	0-50 m/s^2 rms
1 3	0-100 m/s^2 rms
1 4	0-200 m/s^2 rms
1 5	0-250 m/s^2 rms
1 6	0-400 m/s^2 rms
1 7	0-500 m/s^2 rms
1 8	0-25 mm/s rms
1 9	0-50 mm/s rms
2 0	0-100 mm/s rms

Note: For full-scale range options 01, 02, 03, 08, 09, 11, 12, 13, 18 and 19 an accelero-meter interface module with a 100 mV/g output should be used (23733-03 for the standard 23732-01 accelerometer; 24145-02 for the 24147-01 high frequency accelero-meter) or the 330400 Accelerometer Trans-ducer with 100 mV/g output. The remaining options should use an accelerometer inter-face module with an output of 25 mV/g (49578-01 for the standard accelerometer; 155023-01 for the high frequency accelero-meter) or the 330425 Accelerometer Transducer with 25 mV/g output.

C: Channel B Full-scale Range Option

0 1	0-2 gs rms
0 2	0-5 gs rms
0 3	0-10 gs rms
0 4	0-20 gs rms
0 5	0-25 gs rms
0 6	0-40 gs rms
0 7	0-50 gs rms
0 8	0-1 in./sec. rms
0 9	0-2 in./sec. rms
1 1	0-20 m/s^2 rms
1 2	0-50 m/s^2 rms
1 3	0-100 m/s^2 rms
1 4	0-200 m/s^2 rms
1 5	0-250 m/s^2 rms
1 6	0-400 m/s^2 rms
1 7	0-500 m/s^2 rms
1 8	0-25 mm/s rms
1 9	0-50 mm/s rms
2 0	0-100 mm/s rms

Note: For full-scale range options 01, 02, 03, 08, 09, 11, 12, 13, 18 and 19 an accelerometer interface module with a 100 mV/g output should be used (23733-03 for the standard 23732-01 accelerometer; 24145-02 for the 24147-01 high frequency accelerometer) or the 330400 Accelerometer Transducer with 100 mV/g output. The remaining options should use an accelerometer inter-face module with an output of 25 mV/g (49578-01 for the standard accelerometer; 155023-01 for the high frequency accelerometer) or the 330425 Accelerometer Transducer with 25 mV/g output.

D: Agency Approval Option

0 0	Not required
0 1	CSA/NRTL/C
0 2	ATEX self certification

Note: ATEX approval requires the monitor rack be installed in a weatherproof housing.

E: Safety Barrier Option

0 0	None
0 1	External
0 2	Internal

Note: External Safety Barriers must be ordered separately.

F: Alarm Relay Option

0 0	No Relay
0 1	Epoxy-sealed
0 2	Hermetically-sealed
0 3	Quad Relay (Epoxy-Sealed only)
0 4	Spare Monitor-No SIM/SIRM

Notes:

1. AND voting logic is not available with Quad Relays.
2. At least one relay module must be ordered with each 3300 System. If one common relay module per system has been ordered, all monitors of this type must be jumper programmed at the factory to activate a relay bus by ordering a Special Configuration Kit (SCK). Contact your nearest sales office for information.
3. Agency approval places limitations on the relay module. Refer to the Relay Module data sheet for information.
4. Quad Relays are not available with the Internal Safety Barriers option.

G: Trip Multiply Option

0 0	None
0 1	2X
0 2	3X

Spare Relay Module Assemblies

(Order the option in parenthesis for ATEX approved spares)

81544-01(02)

No Relays

81545-01(02)

Dual Epoxy Relays

81546-01(02)

Dual Hermetic Relays

84152-01(02)

Quad Relays

88984-01(04)

Dual Hermetic, Internal Barriers

88984-02(05)

Dual Epoxy, Internal Barriers

88984-03(06)

No Relays, Internal Barriers

Field-programmable Options

These options are field-programmable via plug-in jumpers. **Bold text** indicates options as shipped from the factory.

First Out Option

Enabled

Disabled

Alarm Time Delay Option

0.1 second

1 second

3 seconds

6 seconds

OK Mode Option

Nonlatching

Latching

Timed OK/Channel Defeat Option

Enabled

Disabled

Note: If Timed OK/Channel Defeat is enabled, OK Mode must be nonlatching.

Alert Reset Option

Latching

Nonlatching

Danger Reset Option

Latching

Nonlatching

Recorder Outputs Option

+4 to +20 mA

+1 to +5 Vdc

0 to -10 Vdc

Recorder Clamping Mode

(for +4 to +20 mA only with Timed OK/Channel Defeat enabled).

Not OK = 4 mA

Not OK = 2 mA

Danger Relay Voting Option

OR voting for relay drive

AND voting for relay drive

Note: For Quad Relays, AND voting logic must be done externally by wiring the contacts in series.

High-pass Filter Option

None

One of 499 corner frequencies from 3.7 Hz to 3008 Hz (222 to 180,480 cpm)

Note: High- and low-pass corner frequencies should not be less than two octaves apart.

Low-pass Filter Option

None

One of at least 384 corner frequencies from 24 Hz to 22,372 Hz (1440 to 1,342,320 cpm)

Note: High- and low-pass corner frequencies should not be less than two octaves apart.

Alert Relay Mode Option

Normally de-energized

Normally energized

Danger Relay Mode Option

Normally de-energized

Normally energized

Accessories

128112

Galvanic Isolator Kit

02245002

External Barrier

02200214

Surge Protector

Graphs

3300/26 Dual Accelerometer RMS Monitor

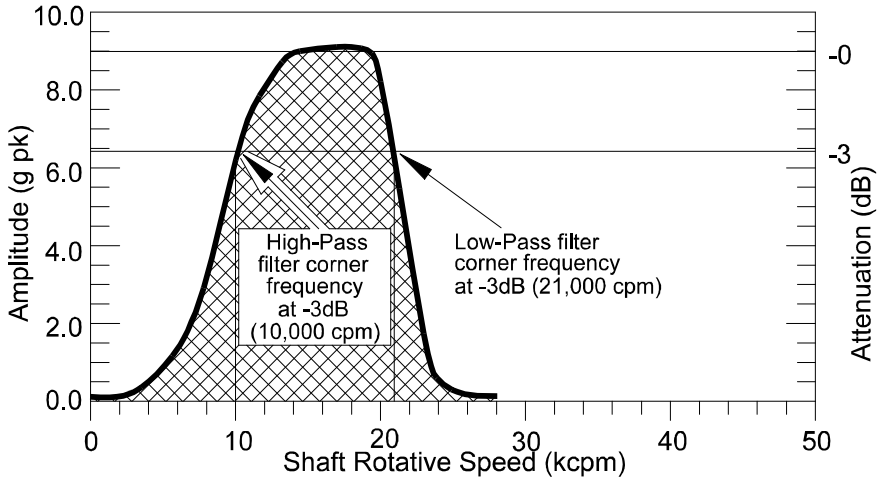


Figure 1: For narrow band frequency measurement (monitoring), filter corner frequencies should be programmed (option jumpers positioned) for values at least two octaves apart. The Response curve shown above represents: high-pass corner frequency 10,000 cpm (167 Hz) and Low-pass corner frequency 21,000 (350 Hz). Recommended is f_{LP} greater than $4f_{HP}$ (two octaves).

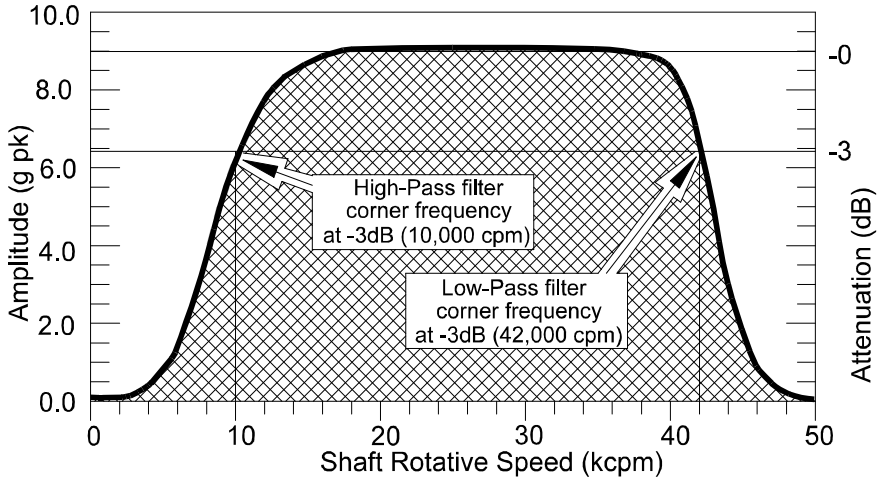


Figure 2: This graph shows the vibration frequency band-pass response for a monitor programmed (option jumpers positioned) as follows: high-pass corner frequency 10,000 cpm (167 Hz), low-pass corner frequency 42,000 cpm (700 Hz). Note that the corner frequencies are determined at the -3dB points (signal is attenuated by approximately 30%).

Field wiring diagram

3300/26 Dual Accelerometer RMS Monitor

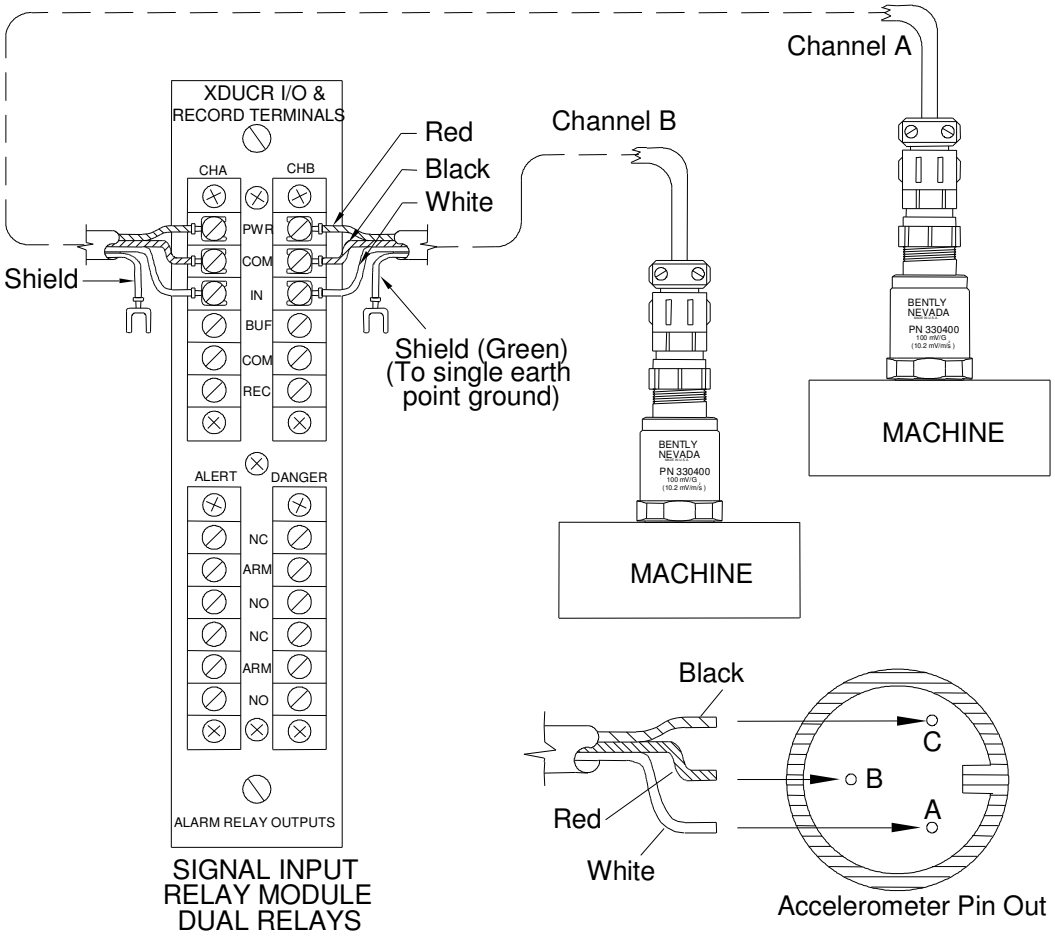


Figure 3: Field wiring diagram for the 3300/26 Dual Accelerometer RMS Monitor

with the 330400 or 330425 Accelerometer

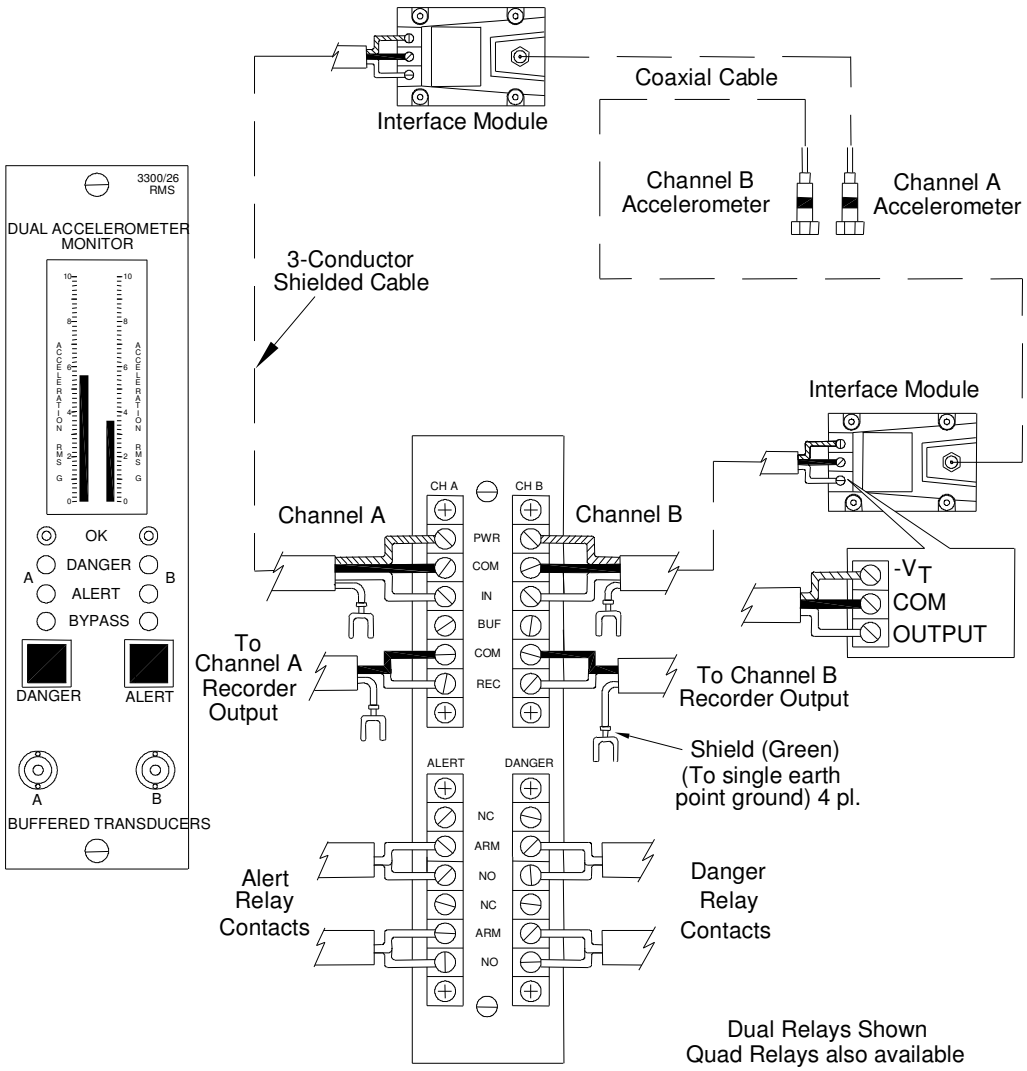


Figure 4: Field wiring diagram for the 3300/26 Dual Accelerometer RMS Monitor

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