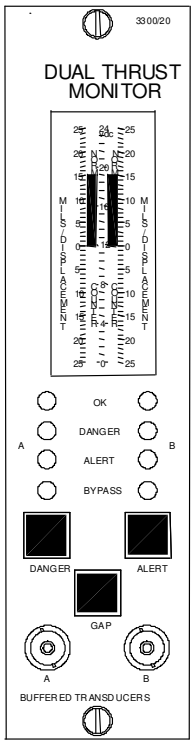
# 3300/20 Dual Thrust Position Monitor

Bently Nevada™ Asset Condition Monitoring




## Description

The 3300/20 Dual Thrust Position Monitor provides early warning of thrust bearing failure. It continuously measures and monitors two independent channels of shaft axial position relative to the axial clearances within the machine. Ideally, the axial probes are installed to observe the thrust collar directly, so the measurement represents the position of the collar relative to the thrust bearing clearance.

**⚠ Caution**

Because thrust measurements are made by observing the gap voltage of the proximity probe used as an input, a transducer failure (gap out of range) can be interpreted by the monitor as thrust position movement and result in a false thrust alarm. For this reason, Bently Nevada LLC. does not recommend the use of a single probe for thrust position applications. Instead, these applications should use two proximity probes observing the same collar or shaft and configure the monitor as AND voting whereby both transducers must simultaneously reach or exceed their alarm setpoints for the monitor's alarm relays to actuate. This 2-out-of-2 voting scheme (also known as AND voting) provides optimum protection against both false trips and missed trips. While the 3300/20 monitor can be programmed for either single voting (OR) or dual voting (AND), dual voting is strongly recommended for all thrust position applications.

**⚠ Caution**

Probe adjustment and range is critical in this monitor for machinery protection. Improper adjustment of the transducer may prevent the monitor from alarming (no machinery protection). For proper adjustment, follow instructions in the manual.

# Specifications

## Inputs

**Signal:**

Accepts one or two proximity probe signal inputs.

**Input Impedance:**

10 k Ω.

**Sensitivity:**

User-programmable for 200 mV/mil (8 V/mm) or 100 mV/mil (4 V/mm).

**Power:**

Nominal consumption of 1.5 watts.

## Signal Conditioning

**Accuracy:**

Within ±0.33% of full-scale typical, ±1% maximum. All specified at temperature of +25°C (+77°F).

## Outputs

**Recorder:**

User-programmable for +4 to +20 mA, 0 to -10 Vdc, or +1 to +5 Vdc. Voltage or current outputs are proportional to programmed monitor full-scale. Independent recorder outputs 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, ±0.09 mA offset.
- **+1 to +5 Vdc:** ±1.1% of signal, ±10 mV offset.
- **0 to -10 Vdc:** ±1.1% of signal, ±15 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 Ω when using +4 to +20 mA option.

**Buffered Transducer Outputs:**

There is one coaxial connector per channel on the front panel and one terminal connection per channel on the rear panel. All are short-circuit protected.

**Output Impedance:**

100 Ω.

**Transducer Supply Voltage:**

User-programmable in power supply for -24 Vdc or -18 Vdc. Current limited on individual monitor circuit board.

**Note:** Contact your nearest sales professional if 3000 series transducers are to be used in the monitoring system which also uses 3300 and/or 7200 series transducers.

## Alarms

**Alarm Setpoints:**

Both alarms (Alert and Danger) are bi-directional (normal and counter), 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 repeatable within 0.39% of full-scale.

## Displays

**Meter:**

Nonmultiplexing vertical bargraph type Liquid Crystal Display (LCD). Individual 63 segment LCD per channel. Probe Gap indicated on a third, center scale. LCD also displays error codes and monitor ADJUST mode.

**Resolution:**

Within ±1.6% of monitor full-scale.

**Size:**

83 mm (3.25 inches), 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 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).

## 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%, noncondensing.

## 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 Thrust Position Monitor**

**3300/20-AXX-BXX-CXX-DXX-EXX**

**Option Descriptions**

**A:** Full-scale Range Option

| | |
|---|---|
| **0 1** | 25-0-25 mils |
| **0 2** | 30-0-30 mils |
| **0 3** | 40-0-40 mils |
| **0 5** | 50-0-50 mils |
| **0 6** | 75-0-75 mils |
| **1 1** | 0.5-0-0.5 mm |
| **1 2** | 1.0-0-1.0 mm |
| **1 3** | 2.0-0-2.0 mm |

**B:** Transducer Input Option

| | |
|---|---|
| **0 1** | 3300 or 7200 Proximitor® systems, 200 mV/mil (Ranges 01, 02, 03, 11, and 12 only.) |
| **0 2** | 7200 11 mm (not 3300XL) Proximitor system, 100 mV/mil |
| **0 3** | 7200 14 mm or 3300 HTPS Proximitor systems, 100 mV/mil |
| **0 4** | 3000 Proximitor® 200 mV/mil (Transducer Output Voltage in power supply must be set for –18 Vdc or use power converter. Ranges 01 and 11 only.) |
| **0 5** | 3300XL NSv and 3300 RAM Proximitor Sensor, 200 mV/mil (Ranges 01 and 11 only). |

**Note:**

1. For 3300 XL 11mm transducers, use mod 146300-01.
2. Contact your nearest sales professional if 3000 series transducers are to be used in a monitoring system which also uses 3300 and/or 7200 Series transducers.

**C:** Alarm Relay Option

| | |
|---|---|
| **0 0** | No Relays |
| **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. Order SCK (Special Configuration Kit) 157520-119 & -120 for bus one or 157520-121 & -122 for bus two.
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.

**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 |

**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 Relay, Internal Barriers

**Notes:**

1. External Safety Barriers must be ordered separately.

2. Quad Relays are not available with Internal Safety Barriers option.

## 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

**OK Mode Option**

**Nonlatching**

Latching

**Alarm Time Delay Option**

0.1 second

**1 second**

3 seconds

6 seconds

**Alert Reset Mode Option**

**Latching**

Nonlatching

**Danger Reset Mode Option**

**Latching**

Nonlatching

**Alert Relay Mode Option**

**Normally de-energized**

Normally energized

**Danger Relay Mode Option**

**Normally de-energized**

Normally energized

**Recorder Outputs Option**

**+4 to +20 mA**

+1 to + 5 Vdc

0 to -10 Vdc

**Danger Relay Voting Option**

**AND voting for relay drive**

OR voting for relay drive

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

**Normal Thrust Direction Option:**

**(programmable per channel)**

**Toward probe**

Away from probe

## Accessories

**89634-01**

-24V to -18V Proximitor Power Converter

**128112**

Galvanic Isolator Kit

**02245002**

External Barrier

**02200214**

Surge Protector