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3300/46 Ramp Differential Expansion Monitor

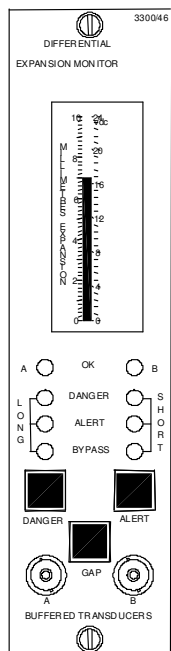
Bently Nevada™ Asset Condition Monitoring

Description

Many large machines requiring differential expansion monitoring do not have a convenient location for mounting the large proximity probes required to make this important measurement. Extremely large machines may require a monitoring range beyond the linear range of even the largest available transducers. The 3300/46 Ramp Differential Expansion Monitor provides for an alternate measurement technique that allows increased monitoring ranges from standard transducers. It is also extremely useful when conventional methods from a collar are not possible.

Two proximity probes are used to observe ramp surfaces, on the rotor, in order to provide one channel of differential expansion. Using ramp surfaces allows increased monitor range with smaller transducers. The monitor's ability to use ramp surface targets also provides added flexibility when choosing a transducer mounting location.

Both the magnitude and direction of differential expansion are displayed on the LCD. The monitor provides four alarm setpoints (two over and two under alarms).



imagination at work

Specifications and Ordering Information
Part Number 141508-01
Rev. F (06/07)

Specifications

Inputs

Signal:

Accepts two proximity probe transducer signals.

Input

Impedance:

10 k Ω .

Signal Scale

Factor:

100 mV/mil (4 V/mm), 20 mV/mil (0.787 V/mm) or
10 mV/mil (3.92 V/mm). Jumper-selectable.

Power

Consumption:

Nominal consumption of 1.5 watts.

Signal Conditioning

Accuracy:

Within $\pm 0.33\%$ of full-scale typical, $\pm 1\%$ maximum.
Specified at ambient temperature of $+25^{\circ}\text{C}$ ($+77^{\circ}\text{F}$).

Outputs

Recorder:

User-programmable for +4 mA to +20 mA, 0 to -10 Vdc, or +1 Vdc to +5 Vdc. Voltage or current outputs are proportional to programmed monitor full-scale. A single composite recorder output is provided on Channel A. Monitor operation is unaffected by short circuits on recorder outputs.

Recorder accuracy (in addition to signal conditioning accuracy):

All specified at $+25^{\circ}\text{C}$ ($+77^{\circ}\text{F}$).

- **+4 to +20 mA:** $\pm 0.7\%$ of signal, ± 0.09 mA offset.
- **+1 to +5 Vdc:** $\pm 1.1\%$ of signal, ± 10 mV offset.
- **0 to -10 Vdc:** $\pm 1.1\%$ 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:

One coaxial connector per transducer 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:

-24 Vdc voltages are current limited per channel on individual monitor circuit board.

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 ($\pm 1.6\%$ of full-scale) to a desired level. Once set, alarms are repeatable within $\pm 0.4\%$ of full-scale.

Relay Modules

Location:

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

Display

Meter:

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

Resolution:

Within $\pm 1.6\%$ of monitor full-scale.

Size:

83 mm (3.2 in), vertical dimension.

LED Indicators

OK:

One constant ON green LED per channel to indicate 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 transducer has been NOT OK but is now OK. OK LED flashing at 5Hz indicates error code(s) stored in memory.

Alarm:

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

Bypass:

Two red LEDs indicate status of Danger Bypass and Rack / Channel Bypass functions.

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:

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.

Ramp Differential Expansion Monitor

3300/46-AXX-BXX-CXX-DXX

Note: The monitor range and ramp angle determine which transducers are compatible for the differential expansion measurement. When selecting the transducer type, refer to Table 1 to verify that it is compatible with the desired meter range and ramp angle.

Option Descriptions

A: Full-scale Range Option

- | | |
|----|----------------|
| 01 | 5-0-5 mm |
| 02 | 0-10 mm |
| 03 | 0.25-0-0.25 in |
| 04 | 0-0.5 in |
| 05 | 10-0-10 mm |
| 06 | 0-20 mm |
| 07 | 0.5-0-0.5 in |
| 08 | 0-1.0 in |
| 09 | 1.0-0-1.0 in |
| 10 | 0-2.0 in |
| 11 | 25-0-25 mm |
| 12 | 0-50 mm |

B: Transducer Input Option

- | | |
|----|--|
| 01 | 7200 11 mm (not XL) |
| 02 | 7200 14 mm or 3300 HTPS or 3300 XL 11 mm |
| 03 | 25 mm |
| 04 | 35 mm |
| 05 | 50 mm |

C: Alarm Relay Option

- | | |
|----|--------------------------------|
| 00 | No Relays |
| 01 | Epoxy-sealed |
| 02 | Hermetically-sealed |
| 03 | Quad Relay (Epoxy-sealed only) |
| 04 | Spare Monitor-No SIM/SIRM |

Note: At least one relay module must be ordered with each 3300

System. If one common relay module per system has been ordered, all other monitors of this type will be jumper-programmed at the factory to activate relay bus one.

D: Agency Approval Option

- | | |
|----|--------------|
| 00 | Not required |
| 01 | CSA/NRTL/C |

Note: CSA/NRTL/C option is only available with relays when the monitor is ordered in a system.

Spare Relay Module Assemblies

81544-01

No Relays

81545-01

Dual Epoxy Relays

81546-01

Dual Hermetic Relays

85119-01

Quad Relays

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

Alert Reset Option

Latching
Nonlatching

Danger Reset Option

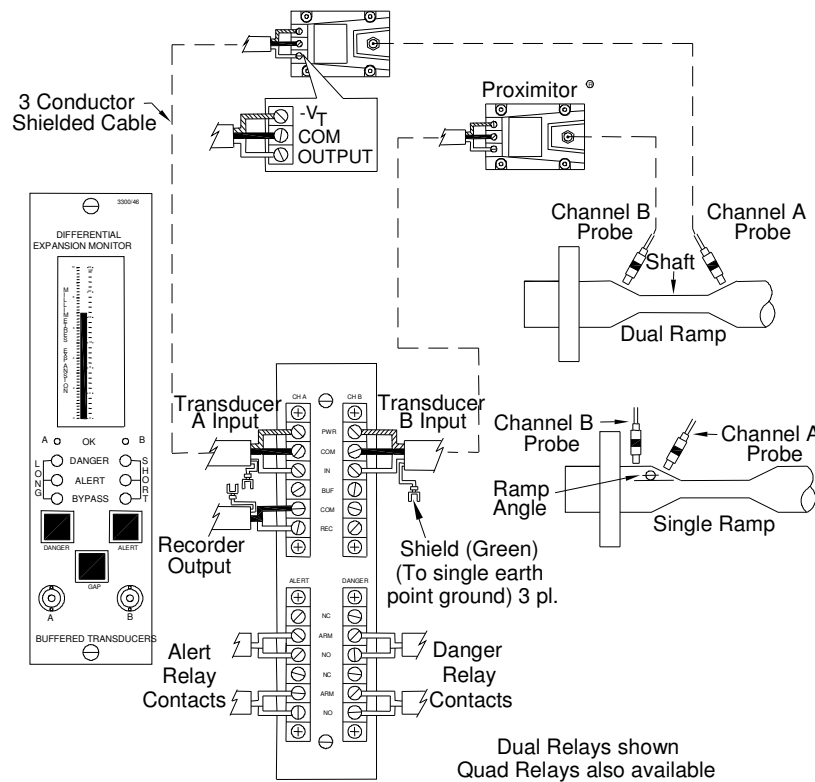
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	Latching	Monitor NOT OK Defeat
	Nonlatching	
Recorder Outputs Option		Disabled
		Enabled
	+4 to +20 mA	Meter Response Time
	+1 to +5 Vdc	
	0 to -10 Vdc	Fast
Alert Relay Mode Option		Slow
	Normally de-energized	Ramp Option
	Normally energized	
Danger Relay Mode Option		Dual
		Single
	Normally de-energized	Upscale Direction Option
	Normally energized	
Danger Bypass Switch Option		Toward Probe A
		Away from Probe A
	Disabled	Ramp Angle Option
	Enabled	
		Programmable for 4 to 45 degrees

Table and Field wiring diagram

3300/46 Ramp Differential Expansion Monitor

Table 1: Transducer versus Meter/Ramp Ranges			
Meter Range	Ramp Angles for each Transducer Type (in degrees)		
	11 & 14 mm,HTPS	25 & 35 mm	50 mm
5-0-5 mm/0-10 mm	4 - 18	4 - 45	11 - 45
0.25-0-0.25 in/0-0.5 in	4 - 15	4 - 45	11 - 45
10-0-10 mm/0-20 mm	4 - 9	4 - 33	11 - 45
0.5-0-0.05 in/0-1 in	4 - 7	4 - 25	11 - 45
1-0-1 in/0-2 in	NA	4 - 12	11 - 28
25-0-25 mm/0-50 mm	NA	4 - 12	11 - 28
Options shipped from factory	7	12	12



Field wiring diagram for 3300/46 Ramp Differential Expansion Monitor

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