



# 2019

Cambia Automation Limited

Cambia Group

## **[ BENTLY NEVADA 3500/30 DATASHEET ]**

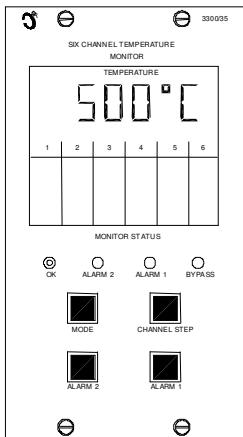
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# 3300/30, 3300/35 Six-Channel Temperature Monitors

Bently Nevada™ Asset Condition Monitoring

## Description

The 3300/30 and 3300/35 Six-Channel Temperature Monitors provide six independent channels of on-line temperature monitoring. Each monitor is suitable for virtually all types of temperature measurements. The monitors accept inputs from up to six thermocouples (3300/30 TC Monitor) or resistance temperature detectors (3300/35 RTD Monitor), which are supplied separately.



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imagination at work

Specifications and Ordering Information  
Part Number 141503-01  
Rev. H (08/07)

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## Specifications

### Inputs

#### Transducer

##### 3300/30

##### TC Monitor:

Accepts up to six grounded or non-grounded tip thermocouple signals; the following thermocouple types and their associated ranges are user-programmable per monitor:

Type J (500°C, 1000°F)

Type K (500°C, 1000°F)

Type T (250°C, 500°F)

Type E (250°C, 500°F)

##### 3300/35

##### RTD Monitor:

Accepts up to six RTD signals. Any of the following RTD sensors and their associated ranges are user-programmable per monitor:

3-wire 100  $\Omega$  platinum ( $\alpha = 0.00385$ ) (500°C /1000°F).

3-wire 100  $\Omega$  platinum ( $\alpha = 0.00392$ ) (500°C /1000°F).

3-wire 120  $\Omega$  nickel (150°C/300°F).

3-wire 10  $\Omega$  copper (100°C/200°F).

4-wire 100  $\Omega$  platinum ( $\alpha = 0.00385$ ) (500°C/1000°F).

4-wire 100  $\Omega$  platinum ( $\alpha = 0.00392$ ) (500°C/1000°F).

4-wire 120  $\Omega$  nickel (150°C/300°F).

4-wire 10  $\Omega$  copper (100°C/200°F).

Changing from a platinum or nickel RTD to a copper RTD requires monitor recalibration. Changing is performed by plug-in jumpers.

**Note:** 3- or 4-wire input is an option which can be easily changed in the field. 2-wire detectors can be connected to either 3- or 4-wire input modules, using proper wiring techniques.

#### Power:

Nominal consumption 4 watts.

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### Signal Conditioning

#### Monitor Range:

Monitor full-scale operating range is selected by user upon ordering. The monitor is factory calibrated when ordered in a system. When spare monitors or power supplies are installed, the monitor should be checked and recalibrated as needed. Ranges allowing recorder output and computer interface signals to be proportional to the input signal, can be subsequently (re)programmed by user in the field.

#### Display Accuracy:

Within  $\pm 1^\circ\text{C}$  (1.8°F) maximum when tenths digit is displayed.  $\pm 1.5^\circ\text{C}$  (2.7°F) when tenths digit is not displayed. Specified at ambient temperature of  $+25^\circ\text{C}$  ( $+77^\circ\text{F}$ ).

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### 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. Individual 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):**

All specified at +25°C (+77° F).

**+4 to +20 mA:** ±1.8% of signal, ±0.09 mA offset.

**+1 to +5 Vdc:** ± 2.2% of signal, ±10 mV offset.

**0 to -10 Vdc:** ± 2.2% 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.

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**Alarms**

**Alarm Setpoints:**

All alarms (Alarm 1 and Alarm 2, per channel) are digitally adjustable from 0 to +500°C (0 to +1000°F) and can be set with 1 digit resolution to desired level. Once set, alarms are repeatable within ±1°C (1.8°F). Alarm 1 is over-alarm, Alarm 2 can be user-programmed for either over- or under-alarm.

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**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.

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**Displays**

**Meter:**

One common, 7 segment numerical, 4 digit with decimal point, non-multiplexing Liquid Crystal Display (LCD). LCD annunciates HIGH READ and OVER or UNDER Alarm. LCD also displays error codes and status (OK, Alarm 1, Alarm 2, Bypass, First Out) per channel.

**Resolution:**

0.1 or 1, user-programmable.

**LED Indicators**

**OK:**

One constant ON green LED per monitor indicates OK condition of all six transducers. Constant OFF green LED indicates one (or more) channel(s) in a NOT OK condition. OK LED flashing at 5 Hz indicates error code(s) stored in memory.

**Alarm:**

Two LEDs indicate alarm status (individually for Alarm 1 and Alarm 2). Flashing alarm LED indicates rack First Out (independent for Alarm 1 and Alarm 2).

**Bypass:**

Red LED indicates status of Alarm 2 Bypass and Rack/Channel Bypass functions.

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**Controls**

**Front Panel:**

Four switches (Alarm 1, Alarm 2, Mode, Step) control display. LCD indicates value measured, dependent on MODE selected (SCAN or HIGH READ). Switch actuation allows LCD to indicate Alarm 1 setpoint level or Alarm 2 setpoint level. Switch actuation does not interrupt other monitoring functions. Flashing LCD indicates channel in ADJUST mode or presence of stored error

codes. Transducer NOT OK for viewed channel flashes four dashes.

**Internal:**

Switches behind monitor front panel control Alarm 2 Bypass, Channels 1 to 6 Bypass and Channels 1 to 6 Alarm setpoint adjust. Two terminal pins provided behind front panel to execute user-invoked self-test. Adjustments are made from front of monitor without powering down monitor or rack.

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**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.

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**CE Mark Directives**

**EMC Directive**

Certificate of Conformity: 158710

**Low Voltage**

**Directive**

Certificate of Conformity: 135300

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**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

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**Physical**

**Space**

**Requirements:**

Two rack positions (any positions except 1 and 2, which are reserved for the Power Supply and System Monitor, respectively).

**Weight**

2.8 kg (6.2 lbs.).

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**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.

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**Six-Channel Temperature TC Input Monitor**

**3300/30 -AXX-BXX-CXX-DXX-EXX**

**Note:** Full-scale Range and Transducer Input Options must be compatible. Refer to Specification \ Inputs section for ranges of transducer types

**A: Full-scale Range Option**

- 01** 0-200°F
- 02** 0-300°F
- 03** 0-400°F
- 04** 0-500°F
- 05** 0-1000°F
- 11** 0-100°C
- 12** 0-150°C
- 13** 0-200°C
- 14** 0-250°C
- 15** 0-500°C

**B: Transducer Input Option**

Specifications and Ordering Information

Part Number 141503-01

Rev. H (08/07)

- 01 Type J
- 02 Type K
- 03 Type T
- 04 Type E

- 02 0-300°F
- 03 0-400°F
- 04 0-500°F
- 05 0-1000°F
- 11 0-100°C
- 12 0-150°C
- 13 0-200°C
- 14 0-250°C
- 15 0-500°C

**C: Alarm Relay Option**

- 00 No Relays
- 01 Epoxy-sealed
- 02 Hermetically-sealed
- 04 Spare Monitor-No SIM/SIRM

**Notes:**

1. 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 Bently Nevada office for information.
2. Agency approval places limitations on the relay module. Refer to the Relay Module data sheet for information.

**D: Agency Approval Option**

- 00 Not required
- 01 CSA/NRTL/C
- 02 ATEX self certification

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

**E: Safety Barrier Option**

- 00 None
- 01 External
- 02 Internal

*Spare Relay Module Assemblies*

*(Order the option in parenthesis for ATEX approved spares)*

**82364-01(02)**

No Relays

**82365-01(02)**

Dual Epoxy Relays

**82366-01(02)**

Dual Hermetic Relays

**82367-01(02)**

TC Input Module

**102566-01(03)**

TC Input Module, Internal Barriers

**Notes:**

1. Grounded tip Thermocouples cannot be used with Intrinsic Safety Barriers.
2. External Safety Barriers must be ordered separately.

**Six-Channel Temperature RTD Input Monitor**

**3300/35 -AXX-BXX-CXX-DXX-EXX**

**Note:** Full-scale Range and Transducer Input Options must be compatible. Refer to Specification/ Inputs section for ranges of transducer types.

**A: Full-scale Range Option**

- 01 0-200°F

**B: Transducer Input Option**

- 01 100 Ω platinum (0.00392) (3-wire)
- 02 100 Ω platinum (0.00385) (3-wire)
- 03 120 Ω nickel (3-wire)
- 04 10 Ω copper (3-wire)
- 05 100 Ω platinum (0.00392) (4-wire)
- 06 100 Ω platinum (0.00385) (4-wire)
- 07 120 Ω nickel (4-wire)
- 08 10 Ω copper (4-wire)

**Note:** Platinum RTD's with 0.00385 alphas are the worldwide industrial standard and are recommended for all applications.

**C: Alarm Relay Option**

- 00 No Relays
- 01 Epoxy-sealed
- 02 Hermetically-sealed
- 04 Spare Monitor-No SIM/SIRM

**Notes:**

1. 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 Bently Nevada office for information.
2. Agency approval places limitations on the relay module. Refer to the Relay Module data sheet for information.

**D: Agency Approval Option**

- 00 Not required
- 01 CSA/NRTL/C
- 02 ATEX self certification

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

**E: Safety Barriers**

- 00 None
- 01 External
- 02 Internal

*Spare Relay Module Assembly*

*(Order the option in parenthesis for ATEX approved spares)*

**82364-01(02)**

No Relays

**82365-01(02)**

Dual Epoxy Relays

82366-01(02)

Dual Hermetic Relays

+1 to + 5 Vdc

0 to -10 Vdc

82368-01(02)

3-Wire Input Module

**Alarm 2 Relay  
Voting Option**

**OR voting for relay drive<sup>1</sup>**

AND voting for relay drive<sup>2</sup>

82369-01(02)

4-Wire Input Module

102566-02(04)

3 or 4 Wire Input Module, Int Bar

**Note:**

1. OR voting allows Channels 1-6 to drive the Alarm 2 Relay.
2. Bently Nevada recommends the use of redundant transducers with AND Alarm 2 voting logic in those installations where the Alarm 2 relay is connected to a machine shutdown device.

**Notes:**

1. External Safety Barriers must be ordered separately.
2. Internal safety barriers are not available for use with 4-wire RTD's (a 4-wire system can be changed to 3-wire by using the jumpers).

**K Mode Option**

**Nonlatching**

Latching

**Recorder drive  
on NOT OK  
Option**

**Downscale**

Upscale

**Note:** NOT OK signal drives the recorder and the computer interface output up or downscale; monitor indicates NOT OK and Bypass in this condition.

## Field-programmable Options

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

**Rack First Out  
Option**

**Disabled**

Enabled

**Monitor First  
Out Option**

**Enabled**

Disabled

**Alarm Time  
Delay Option**

1 second

**3 seconds**

6 seconds

**Alarm 1 Reset  
Option**

Latching

Nonlatching

**Alarm 2 Reset  
Option**

**Latching**

Nonlatching

**Recorder  
Outputs Option**

**+4 to +20 mA**

**Tenth (0.1) Digit  
Option**

**Disabled**

Enabled

**Alarm 1 Relay  
Mode Option**

**Normally de-energized**

Normally energized

**Alarm 2 Relay  
Mode Option**

**Normally de-energized**

Normally energized

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**Accessories**

External Barrier, RTD

02245003

02200406

Surge Protector, TC

02200408

Surge Protector, 3 &amp; 4 wire RTD

02245005

External Barrier, TC

email: sales@cambia.com





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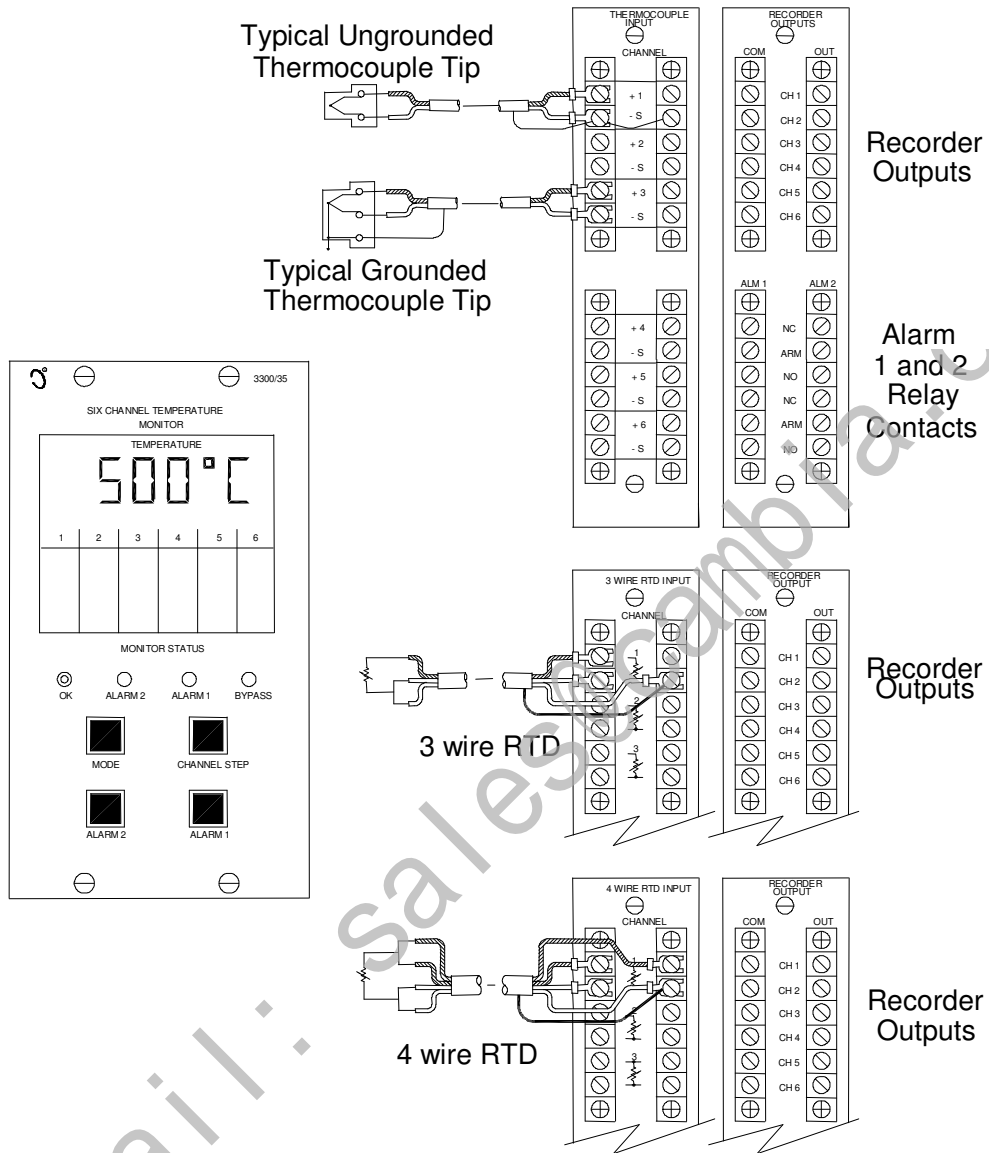
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# Field wiring diagrams

3300/30, 3300/35 Six-Channel Temperature Monitors



Field wiring diagram for the 3300/30 Six-Channel Temperature TC Monitor (top) and 3300/35 Six-Channel Temperature RTD Monitor (bottom).

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Specifications and Ordering Information  
 Part Number 141503-01  
 Rev. H (08/07)