

Bently Nevada 3500 Series Service Manual

3500/61 133819-02

1. Description

Manufacturer : Bently Nevada

3. Product Information

Manufacturer : Bently Nevada

Product No. : 133819-02

Product type : 3500/61 RTD/TC Non-Isolated I/O

Module Internal Terminations.

Made in U.S.A

Specifications

Inputs

Signal Accepts from 1 to 6 RTD or TC
transducer signals.

Input

Impedance

10 MΩ for each lead input.

Power Consumption

3500/61 Nominal consumption of 9
watts.

Transducers

TCs

Type E -100 °C to +1000 °C, (-148 °F to
+1832 °F).

When using any of the isolated
thermocouple I/O modules (-03 or -04
I/O ordering option) with Type E
thermocouples, the available full-scale
range will be reduced if the 3500
system is operated in an ambient
temperature above +35C. The reduced
range will be -60C to +1000C (-76F to
+1832F). Rack configuration software
will allow the user to configure a
channel down to -100C but the system
will not function properly in this
scenario and therefore should not be
configured to operate with these
settings.

Type J -18 °C to +760 °C, (+0 °F to +1400
°F).

Type K -18 °C to +1370 °C, (+0 °F to
+2498 °F)

.Type T -160 °C to +400 °C, (-256 °F to
+752 °F).

RTDs

100Ω 3-wire

& 4-wire

platinum

RTD (alpha

= 0.00385)

-200° C to +850° C
(-328 °F to +1562 °F).

With external barriers:

-50 °C to +850 °C
(-122 °F to +1562 °F).

100Ω 3-wire

& 4-wire

platinum

RTD (alpha

= 0.00392)

-200 °C to +700 °C
(-328 °F to +1292 °F).

With external barriers:

-50 °C to +260 °C

(-122 °F to + 1292 °F).

120Ω 3-wire

& 4-wire

nickel RTD

-80 °C to +260 °C

(-112 °F to +500 °F).

With external barriers:

-50 °C to +260 °C

(-122 °F to + 500 °F).

10Ω 3-wire &

4-wire

copper RTD

-100 °C to +260 °C,

(-148 °F to +500 °F).

With external barriers:

-50 °C to +260 °C

(-122 °F to +500 °F).

Platinum RTD's with

0.00385 alphas are the

worldwide industrial

standard and are

recommended for all

applications

I/O Modules

Isolated I/O Module

System Isolation: 500Vdc

Channel to Channel Isolation:

250 Vdc

Isolation is only required for

fault scenarios and these

voltages will not be present on

the I/O module inputs when a

wiring or field fault occurs.

Outputs

Front Panel LEDs

OK LED Indicates when the

Temperature Monitor is

operating properly.

TX/RX LED Indicates then the Temperature

Monitor is communicating with

other modules in the 3500 rack.

Bypass LED Indicates when the

Temperature Monitor is in

Bypass Mode.

RTD Current Source Value

925 ±15 µA @ 25° C per transducer (single

supply for the 4-wire RTD and two supplies for

the 3-wire).

Recorder

+4 to +20 mA. Values are proportional to

monitor full-scale. Individual recorder values

are provided for each channel. Monitor

operation is unaffected by short circuits on

recorder outputs.

Voltage Compliance (current output)

0 to +12 Vdc range across load. Load

resistance is 0 to 600 Ω.

Resolution

0.3662 μ A per bit $\pm 0.15\%$ error at room temperature $\pm 0.4\%$ error over temperature range.

Signal Conditioning

Specified at +25 °C (+77 °F) unless otherwise noted.

Full-scale range for each channel is set in the field via 3500 Configuration Software. No calibration is required.

RTDs and TCs (except for 10 Ω Copper RTDs)

Resolution 1 °C or 1 °F

Accuracy

Internal

Termination

NonIsolated

Bulkhead

Rack

± 3 °C at 25 °C

(± 5.4 °F at 77 °F).

Standard

Rack

± 3 °C at 25 °C

(± 5.4 °F at 77 °F).

External Termination Non-Isolated

Bulkhead

Rack

± 3 °C at 25 °C

(± 5.4 °F at 77 °F).

Standard

Rack

± 1 °C at 25 °C

(± 1.8 °F at 77 °F).

Internal Termination Isolated

Bulkhead

Rack

± 2 °C at 25 °C

(± 3.6 °F at 77 °F).

± 3 °C at 25 °C

± 5.4 °F at 77 °F).

Standard

Rack

± 3 °C at 25 °C

± 5.4 °F at 77 °F).

External Termination Isolated

Bulkhead

Rack

± 1 °C at 25 °C

(± 1.8 °F at 77 °F).

Standard

Rack

°C at 25 °C

(± 1.8 °F at 77 °F)

10 Ω Copper RTDs

Resolution 1°C or 1 °F

Accuracy ± 3 °C at 25 °C

(± 5.4 °F at 77 °F).

Cold Junction Compensation Sensor (used for TC measurements)

Accuracy $\pm 1^{\circ}\text{C}$ at 25°C

($\pm 1.8^{\circ}\text{F}$ at 77°F).

Alarm

Setpoints

The user can set Alert and Danger setpoints for the value measured by the monitor using software configuration. Alarms are adjustable from 0 to 100% of full-scale for each measured value. The exception is when the full-scale range exceeds the range of the sensor. In this case, the range of the sensor will limit the setpoint. Accuracy of alarms are to within 0.13% of the desired value. The Temperature

Monitors have both under and over alarm setpoints.

Alarm Time Delays

The user can program alarm delays using software as follows:

Alert From 1 to 60 seconds in 1 second intervals.

Danger From 1 to 60 seconds in 0.5 second intervals

Environmental Limits

Operating

Temperature

-30°C to $+65^{\circ}\text{C}$ (-22°F to $+150^{\circ}\text{F}$) when used with

Internal/External Termination

I/O Modules

0°C to $+65^{\circ}\text{C}$ (32°F to $+150^{\circ}\text{F}$) when used with Internal Barrier

I/O Modules (Internal Termination)

Storage

Temperature

-40°C to $+85^{\circ}\text{C}$ (-40°F to $+185^{\circ}\text{F}$)

Physical

I/O Modules

Dimensions

(Height x Width x Depth)

241.3 mm x 24.4 mm x 99.1 mm

(9.50 in x 0.96 in x 3.90 in)

Weight 0.45 kg (1.0 lb)

I/O Modules (Internal barrier)

Dimensions

(Height x Width x Depth)

241.3 mm x 24.4 mm x 163.1 mm

(9.50 in x 0.96 in x 6.42 in)

Weight 0.46 kg (1.01 lb)

Rack Space Requirements

I/O Modules 1 full-height rear slot

Compliance and

Certifications (Approvals

pending)

FCC

This device complies with part 15 of the

FCC Rules. Operation is subject to the

following two conditions:

I This device may not cause harmful

interference.

I This device must accept any

interference received, including

interference that may cause

undesired operation.

EMC

European Community Directive:

EMC Directive 2014/30/EU

Standards:

EN 61000-6-2; Immunity for

Industrial Environments

EN 61000-6-4; Emissions for

Industrial Environments

Electrical Safety

European Community Directive:

LV Directive 2014/35/EU

Standards:

EN 61010-1

RoHS

European Community Directive:

RoHS Directive 2011/65/EU

Cyber Security

Designed to meet IEC 62443

Maritime

DNV GL rules for classification – Ships,

offshore units, and high speed and light

craft

ABS Rules for Condition of Classification,

Part 1

I Steel Vessels Rules

I Offshore Units and Structures

Functional Safety

SIL 2

