Bently Nevada 3500 Series Service Manual

3500/61 163179-02

1. Description

Manufacturer : Bently Nevada

3. Product Information

Manufacturer : Bently Nevada

Product No. : 163179-02

Product type : 3500/60 Temperature Monitor

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.

Tranducers

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 µA per bit ±0.15% error at room

temperature ±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 10Ω 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 ±1° C at 25 °C

(±1.8 °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 Temprature

-30°C to +65°C (-22°F to +150 °F) when used with Internal/External Termination I/O Modules

0°C to +65 °C (32 °F to +150 °F) when used with Internal Barrier I/O Modules (Internal Termination)

Storage Temperature

-40°C to +85°C (-40°F to +185°F)

Physical

Monitor Module Dimensions (Height x Width x Depth)

241.3 mm x 24.4 mm x 241.8 mm

(9.50 in x 0.96 in x 9.52 in)

Weight 0.91 kg (2.0 lb)

Rack Space Requirements

Monitor Module

1 full-height front 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:

l This device may not cause harmful interference.

l 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

l Steel Vessels Rules

l Offshore Units and Structures

Functional Safety

SIL 2