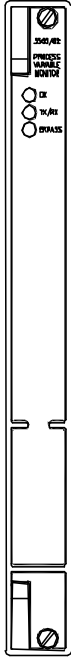# 3500/62 Process Variable Monitor

Bently Nevada™ Asset Condition Monitoring

Description

The 3500/62 Process Variable Monitor is a 6-channel monitor for processing machine critical parameters (pressures, flows, temperatures, levels, etc.) that merit continuous monitoring. The monitor accepts +4 to +20 mA current inputs or any proportional voltage inputs between -10 Vdc and +10 Vdc. It conditions these signals and compares the conditioned signals to user-programmable alarm setpoints.

The user can program the 3500/62 using the 3500 Rack Configuration Software to perform either current or voltage measurements. The 3500/62 offers I/O modules for 3 signal input scenarios: +/-10 Volts DC, isolated 4-20mA, or 4-20 mA with Intrinsically Safe zener barriers. The Internal Barrier I/O provides external power input terminals to provide intrinsically safe power to the 4-20mA transducers

The primary purposes of the 3500/62 monitor are to:

1. continuously compare monitored parameters against configured alarm setpoints to drive alarms for machinery protection, and

2. provide essential machine information for both operations and maintenance personnel.

When used in a Triple Modular Redundant (TMR) configuration, you must install Process Variable Monitors adjacent to each other in groups of three. When used in this configuration, the monitor employs two types of voting to ensure accurate operation and to avoid loss of machinery protection due to single-point failures.

Specifications

Inputs
Signal

+/-10 Vdc I/O

-10 Vdc to +10 Vdc

4-20mA Barrier I/O

4-20mA DC

4-20mA Isolated I/O

4-20mA DC.

Voltage Compliance (4-20mA Barrier I/O 4-20mA out) 13.66 V

Isolation (4-20mA Iso I/O only)

500 volts

Input Impedance

+/-10V I/O

1 M Ω

4-20mA Barrier I/O

50 Ω

4-20mA Isolated I/O

50 Ω

Power Consumption

7.0 watts, typical.

External transducer Power (Internal Barrier I/O Only)

+24 Vdc. +/- 5% @ 250 mA max.

Fused

Outputs
Front Panel LEDs

OK LED

Indicates when the Process Variable Monitor is operating properly.

TX/RX LED

Indicates when the Process Variable Monitor is communicating with other modules in the 3500 rack.

Bypass LED

Indicates when the Process Variable is in Bypass Mode.

Signal Conditioning

Specified at +25 °C (+77 °F). Full-scale range for each channel is set in the field via 3500 Configuration Software. No calibration is required.

Accuracy

Within ±0.33% of full-scale typical, ±1% maximum.

Full Scale Range

Maximum 20,000 units mapped over the input signal span. Minimum input signal span for voltage input is 2 volts.

Alarms
Alarm Setpoints

User can set Alert and Danger setpoints for the value measured by the monitor. using software configuration. Alarms are adjustable and can normally be set 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 which case the setpoint will be limited to the range of the sensor. Accuracy of alarms are to within 0.13% of the desired value. The Process Variable Monitor has both under and over alarm setpoints.

Alarm Time Delays

User can use software to set alarm delays as follows:

Alert

From 1 to 60 seconds in 1 second intervals.

Danger

From 1 to 60 seconds in 0.5 second intervals or to the minimum alarm time delay.

Number of Actual Channels	Minimum Time Delay (ms)
1	225
2	300
3	375
4	450
5	525
6	600

Note: 225 ms alarm time delays will not be available for all channels. As more channels are used the alarm time delay increases. The configuration software will indicate the minimum alarm time delay based on the channel loading.

Proportional Values

Proportional values are Process Variable measurements used to monitor the machine. The Process Variable Monitor returns current or voltage proportional values in a variety of different units that are configurable.

Environmental Limits

Operating Temperature

-30 °C to +65 °C (-22 °F to +149 °F) when used with Internal/External Termination Keyphasor I/O Module.

Operating Temperature

0 °C to +65 °C (+32 °F to +149 °F) when used with Keyphasor Internal Barrier I/O Module (Internal Termination).

Storage Temperature

-40 °C to +85 °C (-40 °F to +185 °F).

Humidity

95%, noncondensing.

CE Mark Directives

EMC Directives

Declaaration of Conformity

134036

IEC61000-6-4

Radiated Emissions

EN 55011, Class A

Conducted Emissions

EN 55011, Class A

IEC61000-6-2

Electrostatic Discharge

EN 61000-4-2, Criteria B

Radiated Susceptibility

ENV 50140, Criteria A

Conducted Susceptibility

ENV 50141, Criteria A

Electrical Fast Transient

EN 61000-4-4, Criteria B

Surge Capability

EN 61000-4-5, Criteria B

Magnetic Field

EN 61000-4-8, Criteria A

Power Supply Dip

EN 61000-4-11, Criteria B

Radio Telephone

ENV 50204, Criteria B

Low Voltage Directives:

EN 61010-1

Safety Requirements

Hazardous Area Approvals

CSA/NRTL/C

Approval Option (01)

Class I, Div 2

Groups A, B, C, D

T4 @ Ta = -20 °C to +65 °C

(-4 °F to +149 °F)

Certification Number

CSA 150268-1002151 (LR 26744)

Approval Option (02)

When used with I/O module ordering options without internal barriers:

A/Ex nC[L] IIC

Class I, Zone 2

Class I, Div 2, Groups A,B,C,D

T4 @ Ta = -20 °C to +65 °C

(-4 °F to +149 °F)

Certification Number

CSA 1389797 (LR 26744-211)

When used with I/O module ordering options with internal barriers:

A/Ex nC[ia] IIC

Class I, Zone 2/(0)

Class I, Div I, Groups A,B,C,D

T4 @ Ta = -20 °C to +65 °C

(-4 °F to +150 °F)

Certification Number

CSA 1389797 (LR 26744-211)

ATEX

Approval Option (02)

For Selected Ordering Options with ATEX/CSA agency approvals:

⟨Ex⟩ II 3/(3) G

EEx nCAL[L] IIC

T4 @ Ta = -20 °C to +65 °C

(-4 °F to +150 °F)

Certification Number

LCIE 04 ATEX 6161X

Note: When used with Internal Barrier I/O Module, refer to specification sheet 141495-01 for approvals information.

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:

0.82 kg (1.8 lbm)

I/O Modules (without barriers)

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:

0.20 kg (0.44 lbm)

I/O Module (with barriers)

*Dimensions
(Height x Width
x Depth):*

241.3 mm × 24.4 mm × 99.1 mm

(9.50 in × 0.96 in × 3.90 in)

Weight:

0.46 kg (1.01 lbm)

Rack Space Requirements

Monitor Module:

1 full-height front slot.

I/O Modules:

1 full-height rear slot.

Ordering Considerations

General

If the 3500/62 Module is added to an existing 3500 Monitoring System, the monitor requires the following (or later) firmware and software versions:

3500/20 Module Firmware – 1.07 (Rev G)
3500/01 Software – Version 2.20
3500/02 Software – Version 2.10
3500/03 Software – Version 1.20

If the Internal Barrier I/O is used the system must also meet these requirements:

3500/62 Module Firmware- 1.06 (Rev C)
3500/01 Software – Version 2.30

You cannot use External Termination Blocks with Internal Termination I/O modules.
When ordering I/O Modules with External Terminations, you must order the External Termination Blocks and Cables separately.

Internal Barrier I/O Module

Important info

Consult the 3500 Internal Barrier specification sheet (part number 141495-01) if you select the Internal Barrier Option.

Fuse:

250 mA, 250 Volt fast blow type.

Ordering Information

Process Variable Monitor
3500/62-AXX-BXX

A: I/O Module Type

0 1	-10 to +10 Vdc I/O Module with Internal Terminations
0 2	-10 to +10 Vdc I/O Module with External Terminations
0 3	Isolated +4 to +20 mA I/O Module with Internal Terminations
0 4	Isolated +4 to +20 mA I/O Module with External Terminations
0 5	Non-Isolated +4 to +20 mA I/O Module with Internal Barriers and Internal Terminations

B: Agency Approval Option

0 0	None
0 1	CSA/NRTL/C
0 2	ATEX/CSA (Class 1, Zone 2)

Note: Agency Approval Option B 02 is available only with Ordering Options A 01 and A 05.

External Termination Blocks
136595-01

3500/62 External Termination Block (Terminal Strip Connectors).

136603-01

3500/62 External Termination Block (Euro Style Connectors).

CABLES

3500/62 Transducer (XDCR) Signal to External Termination (ET) Block Cable
134544-AXXXX-BXX

A: Cable Length

0 0 0 5	5 feet (1.5 metres)
0 0 0 7	7 feet (2.1 metres)
0 0 1 0	10 feet (3 metres)
0 0 2 5	25 feet (7.5 metres)
0 0 5 0	50 feet (15 metres)
0 1 0 0	100 feet (30.5 metres)

B: Assembly Instructions

0 1	Not Assembled
0 2	Assembled

Spares

163179-03

3500/62 Monitor

136590-01

Firmware IC

04425545

Grounding Wrist Strap (single use)

04400037

IC Removal Tool

136491-01

-10 Vdc to +10 Vdc I/O Module
with Internal Terminations

136499-01

-10 Vdc to +10 Vdc I/O Module
with External Termina0ions

136294-01

Isolated +4 to +20 mA I/O Module
with Internal Terminations

136483-01

Isolated +4 to +20 mA I/O Module
with External Terminations

137110-01

4 to 20 mA Barrier I/O Module
with Internal Terminations

136973-01

3500/62 Manual

01700059

Replacement Fuse for Barrier I/O

Graphs and Figures
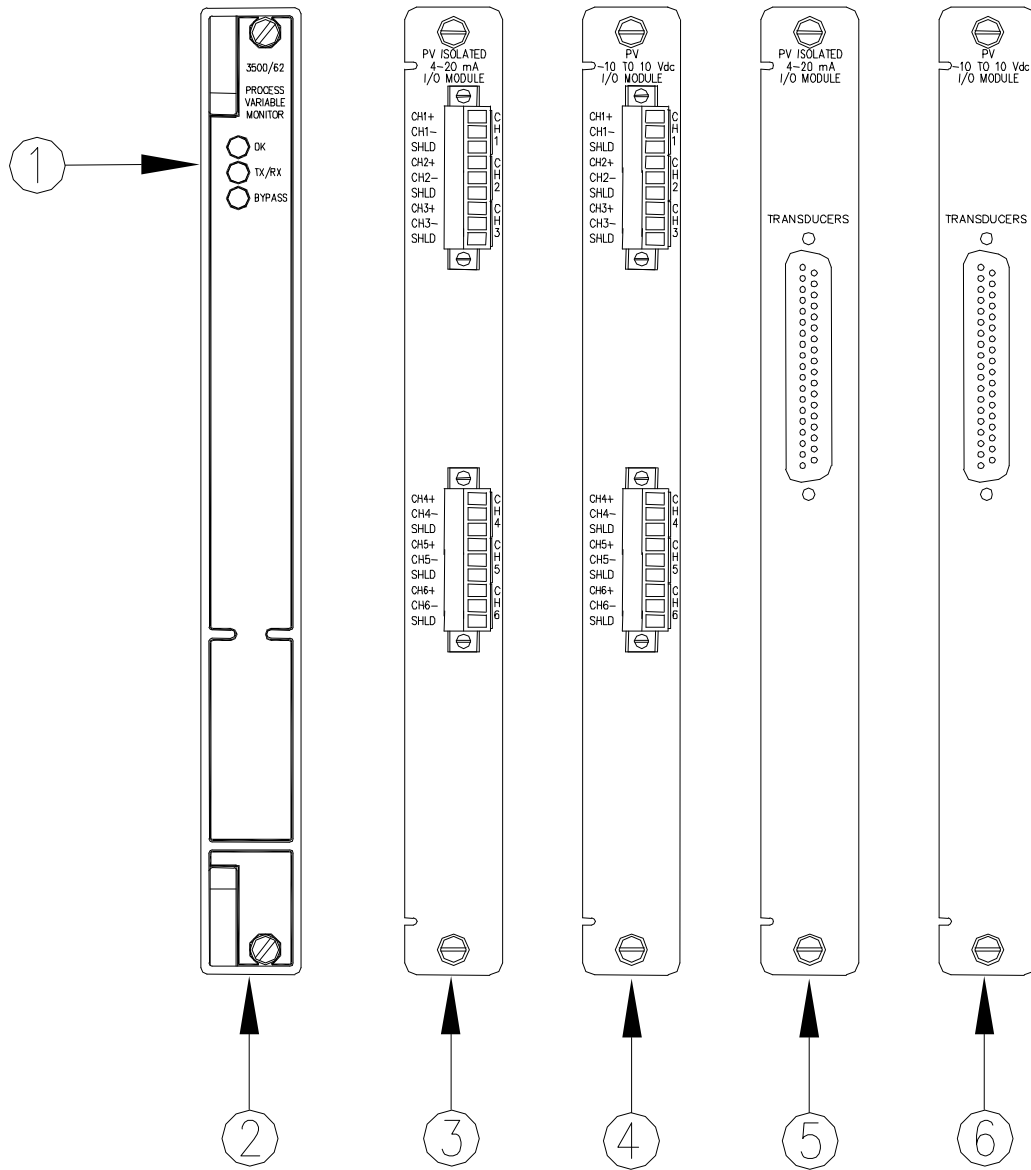
1. Status LEDs
2. Main Module Front View
3. 4 to 20mA Internal Terminations I/O Module
4. –10 to +10 Vdc Internal Terminations I/O Module
5. 4 to 20mA External Terminations I/O Module
6. -10 to +10 Vdc Internal Terminations I/O Module

Figure 1: Front and Rear Views of the Process Variable Monitor