# 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. 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 is 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 Active Channels | Minimum Time Delay (ms) |
|---|---|
| 0 | 270 |
| 1 | 360 |
| 2 | 450 |
| 3 | 540 |
| 4 | 630 |
| 5 | 720 |
| 6 | 810 |

**Note:** You can also set the Danger time delay at a millisecond interval that varies from 270 to 810 milliseconds, depending on the number of active channels. The millisecond danger interval is determined as follows:

270ms minimum time + (90ms x number of active 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 I/O Module.

**Operating Temperature**

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

**Storage Temperature**

-40 °C to +85 °C

(-40 °F to +185 °F).

**Humidity**

95%, noncondensing.

## Compliance and Certifications

### EMC

Standards:

EN 61000-6-2 Immunity for Industrial Environments
EN 61000-6-4 Emissions for Industrial Environments

## Electrical Safety

Standards:

EN 61010-1

## Hazardous Area Approvals

**For a detailed listing of country and product specific approvals, refer to the *Approvals Quick Reference Guide* (document 108M1756) located at the following website: www.GEmeasurement.com.**

**CSA/NRTL/C**

***Approval Option (01)***

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

Ex nC [ia] IIC: Class I, Div 1

AEx nC [ia] IIC: Class I, Zone 2/0

Groups A, B, C, D

T4 @ Ta = -20 °C to +65 °C

(-4 °F to +150 °F)

per drawing 138547

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

Ex nC [L] IIC: Class I, Div 2

AEx nC IIC: Class I, Div 2

Groups A, B, C, D

T4 @ Ta = -20 °C to +65 °C

(-4 °F to +150 °F)

Per drawing 149243

**ATEX**

***Approval Option (02)***

**For ATEX agency approval ordering options with internal barriers:**

 II 3 / (1) G

Ex nC[ia Ga] IIC T4 Gc

T4 @ Ta = -20 °C to +65 °C

(-4 °F to +150 °F)

**For ATEX agency approval ordering options without internal barriers:**

 II 3 / (3) G

Ex nC[nL Gc] IIC T4 Gc

T4 @ Ta = -20 °C to +65 °C

(-4 °F to +150 °F)

## 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 x 24.4 mm x 99.1 mm

(9.50 in x 0.96 in x 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

**For a detailed listing of country and product specific approvals, refer to the *Approvals Quick Reference Guide* (document 108M1756) located at the following website: www.GEmeasurement.com.**

**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 Terminations

**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

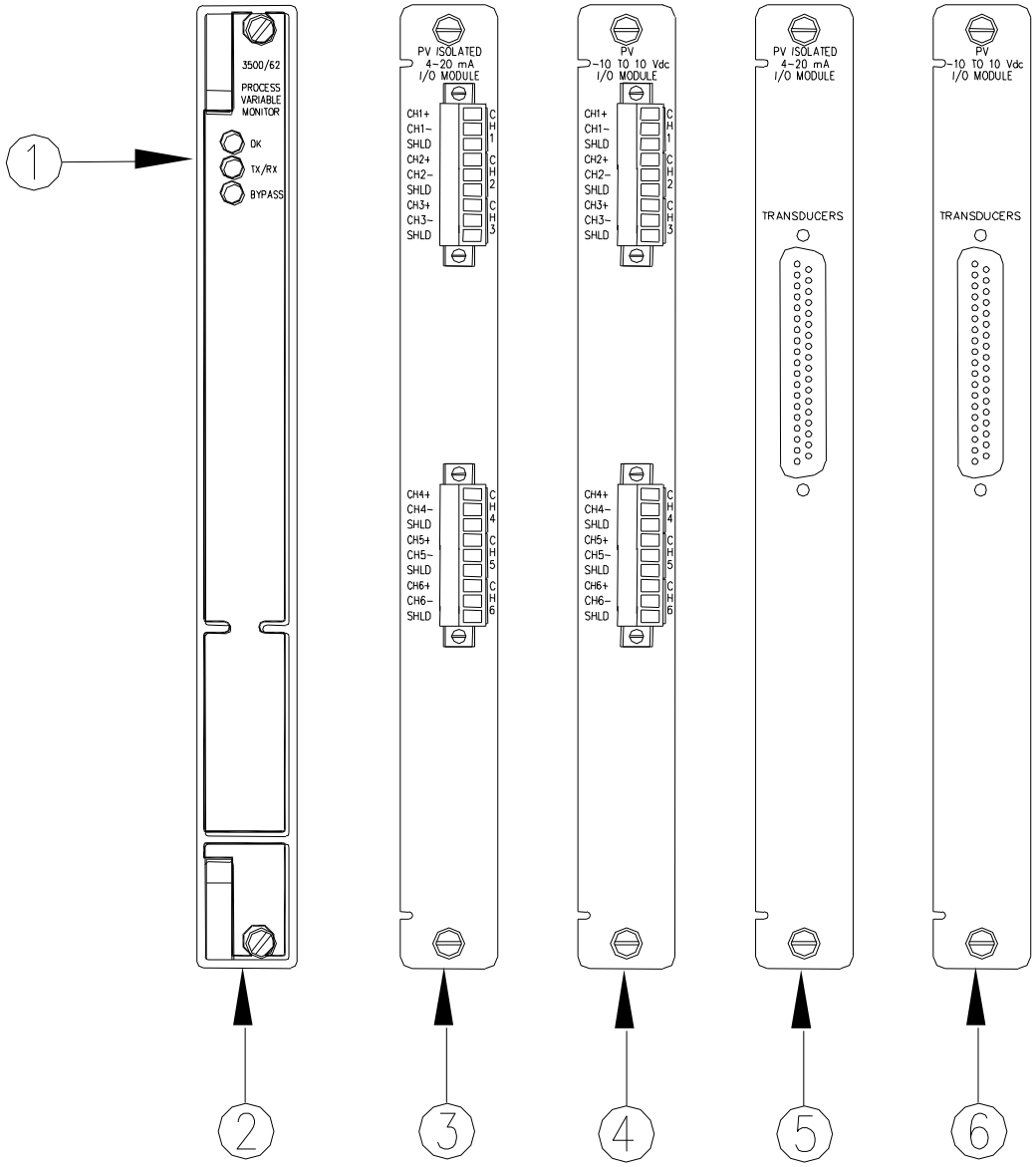
**136973-01**

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 External Terminations I/O Module

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

Printed in USA. Uncontrolled when transmitted electronically.

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