

MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

3500 SYSTEM

3500/63 163179-04

SIX-CHANNEL PROCESS VARIABLE MONITOR

Applicable product family: Bently Nevada 3500 machinery protection systems

OFFICIAL SOURCE

3500-63 163179-04.pdf

The following pages are selected from the supplied manufacturer document and retain their original page content.

Specifications and Ordering Information 3500/63 Hazardous Gas Monitor



protection of personnel in the area and for the protection of the equipment. Housings around natural gas fired industrial gas turbines, hydrogen pipeline compressors, or compressor doghouses are all examples of confined spaces where combustible gases could accumulate.

When used in a Triple Modular Redundant (TMR) configuration, Hazardous Gas Monitors must be installed adjacent to each other in groups of three. When used in this configuration, two types of voting are employed to insure accurate operation and to avoid single-point failures.

Specifications

Inputs

<i>Signal:</i>	3-wire heated catalytic bead, single-arm resistance bridge.
<i>Sensor Constant Current (each sensor):</i>	290 to 312 mA @ 23 °C 289 to 313 mA @ -30 °C to 65 °C
<i>Sensor OK Range:</i>	Detects sensor and field wiring open circuits.
<i>Sensor Cable Resistance:</i>	20 Ω per bridge leg maximum
<i>Input Impedance:</i>	200 KΩ
<i>Power Consumption:</i>	7.0 Watts, typical.
<i>External transducer Power</i>	+24 Vdc +4 / -2 Vdc @ 1.8 A Minimum
<i>Monitor Alarm Inhibit</i>	Contact closure inhibits monitor alarms.
<i>Voltage</i>	+5 Vdc typical
<i>Current</i>	0.4 mA typical, 4 mA peak

Description

The 3500/63 Hazardous Gas Monitor is a six-channel monitor that is used as a safety-system element by providing levels of alarms based on the concentration of combustible gases. An alarm issued by this monitor indicates that the gas concentration is sufficient to cause personal safety concerns because of explosion or asphyxiation. It is designed for use with heated catalytic-bead gas sensors (Hydrogen and Methane) and indicates hazardous gas concentration as a percentage of the lower explosive level (LEL). The monitors can be utilized in either a simplex or redundant (TMR) 3500 Rack configuration..

The Hazardous Gas Monitor application is particularly suited for enclosed or confined spaces where combustible gases are used as fuels or are being handled, pumped or compressed. If a leak occurs, the gases may accumulate and reach a potentially explosive concentration. Detection and alarming on gas concentrations is critical for the

Outputs

Front Panel LEDs

OK LED: Indicates when the Hazardous Gas Monitor is operating properly.

TX/RX LED: Indicates when the Hazardous Gas Monitor is communicating with other modules in the 3500 Rack.

Bypass LED: Indicates when the Hazardous Gas Monitor or a channel in the monitor is in Bypass Mode.

Cal LED Indicates that the Hazardous Gas Monitor is in either the Calibration mode or the Calibration Check mode.

Recorder Output Applies to each channel

Current Output 4 to 20 mA representing 0 to 100% of monitor channel full scale.

Not OK / Bypass current User Selectable

Compliance Voltage 12 Vdc maximum

Load Impedance 600 Ω maximum

Signal Conditioning

Specified at +25°C (+77°F).

Accuracy: Within $\pm 0.33\%$ of full-scale typical, $\pm 1\%$ maximum.

Full Scale Range: Maximum 100 LEL units.

Resolution: 0.0015%

Alarms

Alarm Setpoints: Alert and danger setpoints can be set for the value measured by the monitor. All alarm setpoints are set using software configuration. Alarms are adjustable and can normally be set from 0 to 100% of full-scale for each measured value. The Hazardous Gas Monitor only has over alarm setpoints.

Alarm Accuracy: Within 0.13% of the desired value

Alarm Hysteresis: Fixed 0.5% full scale.

Alarm Time Delays: Alarm delays can be programmed using software, and can be set as follows:

Alert: From 1 to 60 seconds in 1 second intervals.

Danger: From 1 to 60 seconds in .5 second intervals or to the minimum alarm time delay.

Proportional Values Hazardous Gas LEL, Remaining Calibration interval

Environmental Limits

Operating Temperature: -30°C to +65°C (-22°F to +150°F)

Storage Temperature: -40°C to +85°C (-40°F to +185°F).

Humidity: 95%, noncondensing.

CE Mark Directives (Pending)

EMC Directives:

IEC 60533: Radiated Emissions
Conducted Emissions
DNV Std for Cert 2.4 (3.14 & 3.15)
ClassNK, Part 7, Chapter 1 (1.3)

EN50082-2: Electrostatic Discharge
EN 61000-4-2,
Radiated Susceptibility
EN 61000-4-3,
Conducted Susceptibility
EN 61000-4-6,
Electrical Fast Transient
EN 61000-4-4,
Magnetic Field
EN 61000-4-8,

Low Voltage Directives:

EN 61010-1 Safety Requirements

Hazardous Area Approvals

CSA-NRTL/C: When used with Internal/External
Termination I/O Module: Class I,
Division 2, Groups A through D

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: 0.82 kg (1.8 lbs.).

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: 0.20 kg (0.44 lbs.).

3500 Rack Space Requirements

Monitor Module: 1 full-height front slot.

I/O Modules: 1 full-height rear slot.

Ordering Considerations

General

If the 3500/63 Hazardous Gas Detection Monitor is added to an existing 3500 Monitoring System, the following (or later) firmware and software versions are required:

3500/20 RIM Firmware - Revision L or later,
3500/22M
3500 Rack Configuration Software - Version 3.6 or later,
3500/01 Data Acquisition Software - Version 2.42 or later,
3500/02 Operator Display Software - Version 1.42 or later,
System 1™ Version 5.0 or later

External Termination Blocks cannot be used with Internal Termination I/O modules.

When ordering I/O Modules with External Terminations, the External Termination Blocks and Cables must be ordered separately.

Ordering Information

3500/63-AX-BX (00 denotes a selection of None)

*A: Input/Output
Module:* **01** Internal Termination
Catalytic Bead
02 External Termination
Catalytic Bead

B: Agency Approvals: **00** None
01 CSA-NRTL/C

External Termination Blocks

165902-01 3500/63 External Termination
Block (Transducer, Terminal Strip
Connectors).

165901-01 3500/63 External Termination
Block (Transducer, Euro Style
Connectors).

133892-01	3500/63 External Termination Block (Recorder, Terminal Strip Connectors).	164895-01	I/O Module with External Terminations
133900-01	3500/63 External Termination Block (Recorder, Euro Style Connectors).	166848-01	3500/63 Manual
00580440	Connector Header, Internal Termination, 3 Position		
00580445	Connector Header, Internal Termination, 9 Position		
00580446	Connector Header, Internal Termination, 12 Position		

CABLES

3500/63 Transducer (XDCR) Signal to External Termination (ET) Block Cable

134544-AXXXX-BXX

Option Descriptions

<i>A: Cable Length</i>	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)

<i>B: Assembly</i>	0 1	Not Assembled
<i>Instructions</i>	0 2	Assembled

3500/63 Recorder Signal to External Termination (ET) Block Cable

134543-AXXXX-BXX

Option Descriptions

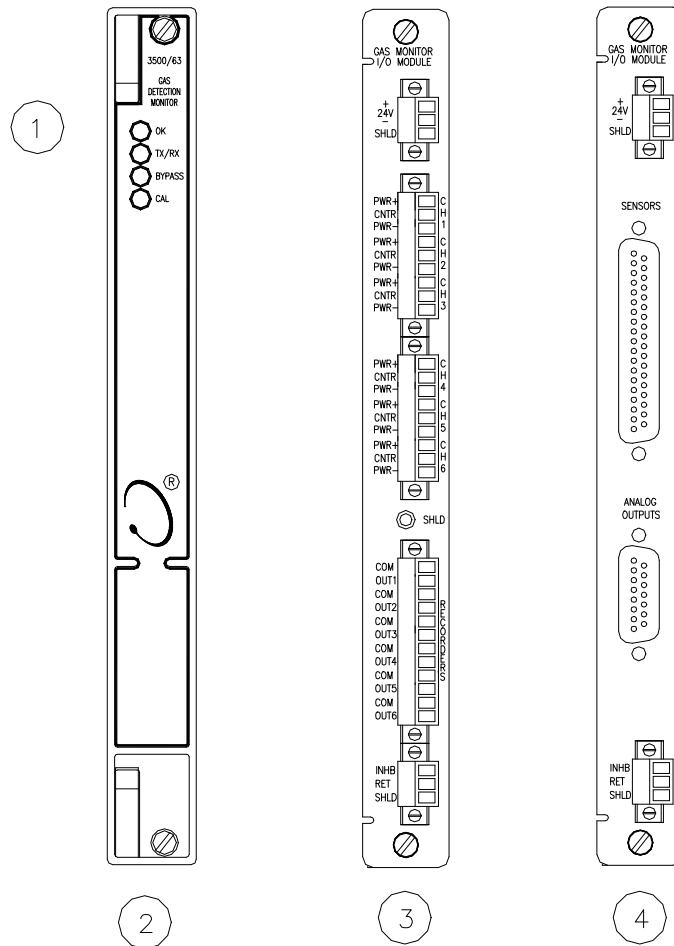
<i>A: Cable Length</i>	0 0 0 5	5 feet (1.5 metres)
	0 0 0 7	7 feet (2.1 metres)
	0 0 1 0	10 feet (3 metres)
	0 0 2 5	25 feet (7.5 metres)
	0 0 5 0	50 feet (15 metres)
	0 1 0 0	100 feet (30.5 metres)

<i>B: Assembly</i>	0 1	Not Assembled
<i>Instructions</i>	0 2	Assembled

Spares

163179-04	3500/63 Monitor
164578-01	I/O Module with Internal Terminations

Figures and Tables



- 1) Status LEDs
- 2) Main Module Front View
- 3) Internal Terminations I/O Module
- 4) External Terminations I/O Module

Front and rear views of the Hazardous Gas Monitor

All data is subject to change without notice

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