

Trig-Tek™

619B

Vibration Monitor/Alarm

User Manual

Publication No. 980960 Rev. B

Astronics Test Systems Inc.

4 Goodyear, Irvine, CA 92618

Tel: (800) 722-2528, (949) 859-8999; Fax: (949) 859-7139

atsinfo@astronics.com atssales@astronics.com
atshelpdesk@astronics.com <http://www.astronictestsystems.com>

**THANK YOU FOR PURCHASING THIS
ASTRONICS TEST SYSTEMS PRODUCT**

For this product, or any other Astronics Test Systems product that incorporates software drivers, you may access our web site to verify and/or download the latest driver versions. The web address for driver downloads is:

<http://www.astronicstestsystems.com/support/downloads>

If you have any questions about software driver downloads or our privacy policy, please contact us at:

atsinfo@astronics.com

WARRANTY STATEMENT

All Astronics Test Systems products are designed to exacting standards and manufactured in full compliance to our AS9100 Quality Management System processes.

This warranty does not apply to defects resulting from any modification(s) of any product or part without Astronics Test Systems express written consent, or misuse of any product or part. The warranty also does not apply to fuses, software, non-rechargeable batteries, damage from battery leakage, or problems arising from normal wear, such as mechanical relay life, or failure to follow instructions.

This warranty is in lieu of all other warranties, expressed or implied, including any implied warranty of merchantability or fitness for a particular use. The remedies provided herein are buyer's sole and exclusive remedies.

For the specific terms of your standard warranty, contact Customer Support. Please have the following information available to facilitate service.

1. Product serial number
2. Product model number
3. Your company and contact information

You may contact Customer Support by:

E-Mail:	atshelpdesk@astronics.com	
Telephone:	+1 800 722 3262	(USA)
Fax:	+1 949 859 7139	(USA)

RETURN OF PRODUCT

Authorization is required from Astronics Test Systems before you send us your product or sub-assembly for service or calibration. Call or contact Customer Support at 1-800-722-3262 or 1-949-859-8999 or via fax at 1-949-859-7139. We can also be reached at: atshelpdesk@astronics.com.

If the original packing material is unavailable, ship the product or sub-assembly in an ESD shielding bag and use appropriate packing materials to surround and protect the product.

PROPRIETARY NOTICE

This document and the technical data herein disclosed, are proprietary to Astronics Test Systems, and shall not, without express written permission of Astronics Test Systems, be used in whole or in part to solicit quotations from a competitive source or used for manufacture by anyone other than Astronics Test Systems. The information herein has been developed at private expense, and may only be used for operation and maintenance reference purposes or for purposes of engineering evaluation and incorporation into technical specifications and other documents which specify procurement of products from Astronics Test Systems.

TRADEMARKS AND SERVICE MARKS

All trademarks and service marks used in this document are the property of their respective owners.

- Racal Instruments, Talon Instruments, Trig-Tek, ActivATE, Adapt-A-Switch, N-GEN, and PAWS are trademarks of Astronics Test Systems in the United States.

DISCLAIMER

Buyer acknowledges and agrees that it is responsible for the operation of the goods purchased and should ensure that they are used properly and in accordance with this document and any other instructions provided by Seller. Astronics Test Systems products are not specifically designed, manufactured or intended to be used as parts, assemblies or components in planning, construction, maintenance or operation of a nuclear facility, or in life support or safety critical applications in which the failure of the Astronics Test Systems product could create a situation where personal injury or death could occur. Should Buyer purchase Astronics Test Systems product for such unintended application, Buyer shall indemnify and hold Astronics Test Systems, its officers, employees, subsidiaries, affiliates and distributors harmless against all claims arising out of a claim for personal injury or death associated with such unintended use.

FOR YOUR SAFETY

Before undertaking any troubleshooting, maintenance or exploratory procedure, read carefully the **WARNINGS** and **CAUTION** notices.



This equipment contains voltage hazardous to human life and safety, and is capable of inflicting personal injury.



If this instrument is to be powered from the AC line (mains) through an autotransformer, ensure the common connector is connected to the neutral (earth pole) of the power supply.



Before operating the unit, ensure the conductor (green wire) is connected to the ground (earth) conductor of the power outlet. Do not use a two-conductor extension cord or a three-prong/two-prong adapter. This will defeat the protective feature of the third conductor in the power cord.



Maintenance and calibration procedures sometimes call for operation of the unit with power applied and protective covers removed. Read the procedures and heed warnings to avoid "live" circuit points.

Before operating this instrument:

1. Ensure the proper fuse is in place for the power source to operate.
2. Ensure all other devices connected to or in proximity to this instrument are properly grounded or connected to the protective third-wire earth ground.

If the instrument:

- fails to operate satisfactorily
- shows visible damage
- has been stored under unfavorable conditions
- has sustained stress

Do not operate until performance is checked by qualified personnel.

Table of Contents

Chapter 1	1-1
Introduction	1-1
Specifications	1-1
Accel Input	1-1
AC Output	1-2
DC Output	1-2
4–20 mA Output	1-2
Alarm Relay	1-2
Power	1-3
Size	1-3
Chapter 2	2-1
Installation	2-1
Mounting	2-1
Wiring	2-2
Chapter 3	3-1
Operation	3-1
Alarm Settings	3-2
Chapter 4	4-1
Performance Test	4-1
Test Equipment	4-1
Outputs	4-1
Sensor	4-2
Alarm Set Point	4-2
Chapter 5	5-1
Calibration Procedure	5-1
Test Equipment	5-1
Calibration Procedure	5-1
Alarm Setting	5-1

List of Figures

Figure 1-1, 619B Vibration Monitor/Alarm.....1-1

Figure 2-1, 619B Mounting Dimensions.....2-1

Figure 2-2, 619B Conduit Wiring Drawing2-2

Figure 3-1, 619B Block Diagram.....3-1

DOCUMENT CHANGE HISTORY

Revision	Date	Description of Change
A	02/07/2011	Document Control release
B	06/16/2011	Revised per EO 30519 Updated user manual throughout to remove "-2" after any 619B reference.

This page was left intentionally blank.

Chapter 1

Introduction

The 619B Vibration Monitor/Alarm (**Figure 1-1**) is designed to monitor for excessive vibration and provide a relay contact closure if a preset (alarm) vibration level is exceeded. The alarm setting is set at time of manufacturing as required by the customer. The unit is intended to work with a 100 mV/g sensor.

For monitoring purposes the unit has a 0 to 5 Volt RMS fullscale AC, 0 to 5 VDC, and a 4 to 20 mA current output for 0 to 20 g pk at the input. The current output is 0 when the pickup is open or shorted.

The Vibration Monitor Alarm operates with 115 Volt RMS AC at 60-400 Hz and is packaged in a small water-tight enclosure.

The input to the vibration monitor alarm is from an external 100 mV/g sensor. The sensor interfaces through a two-pin connector (MS 3102A-105L-4P).



Figure 1-1, 619B Vibration Monitor/Alarm

Specifications

Accel Input

Sensitivity	100 mV/g
Impedance	Greater than 100 k
Frequency Range	5 Hz to 20 kHz

Level	2000 mV pk max
Connector	MS 3102A-105L-4P
Mate	MS 3106A-105L-4S-SR

AC Output

Impedance	Less than 100 ohms
Level	250 mV RMS/g peak
Frequency Response	±5% 10 to 3000 Hz (Series with filters)
Contacts TB2	SIG AC, S GND

DC Output

Impedance	Less than 100 ohms
Level	250 mV per 1 g peak
Linearity	±1%
Contacts TB2	SIG AC, S GND

4–20 mA Output

Sensitivity	0 to 20 g peak, 4-20 mA
Linearity	±1%
Contacts TB2	4-20+, –

Alarm Relay

Range	2 – 20 g's
Contacts TB1	NC, COM, NO
Contacts Ratings	3.0 A - 125 VAC 5 A – 30 VDC 3.0 A - 125 VDC resistive
Contacts TB2	RESET, S GND (Short to Reset) (Open to Arm)

Power

(115 VAC RMS)
Contacts TB 1

115 VAC RMS at 58–400 Hz
LINE, NUET, CH GND.

Size

5.5" long, 5.5" wide, and 2.9" high
(113.9 cm x 113.9 cm x 7.34 cm)

This page was intentionally left blank.

Chapter 2

Installation

Mounting

The 619B is contained in a box 5.5" x 5.5" x 3" in size and mounts to a flat plate using four 8-32 screws. See mounting diagram for the plate in **Figure 2-1**.

The cover must be removed to access the mounting holes.

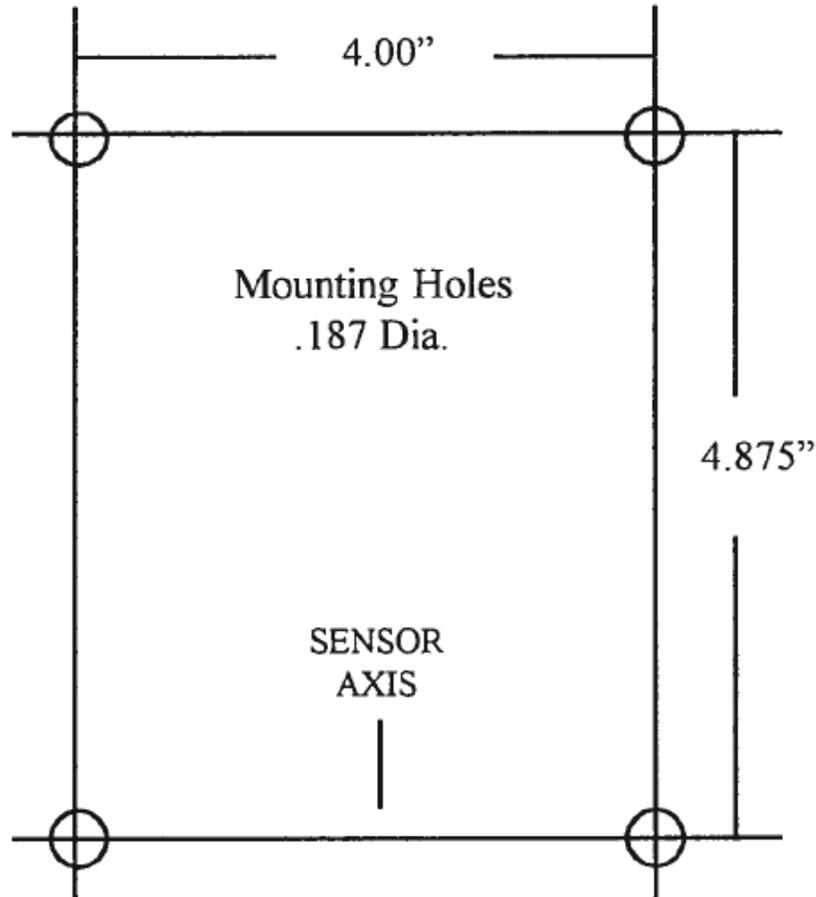


Figure 2-1, 619B Mounting Dimensions

Wiring

Connect the wires as shown in **Figure 2-2**.

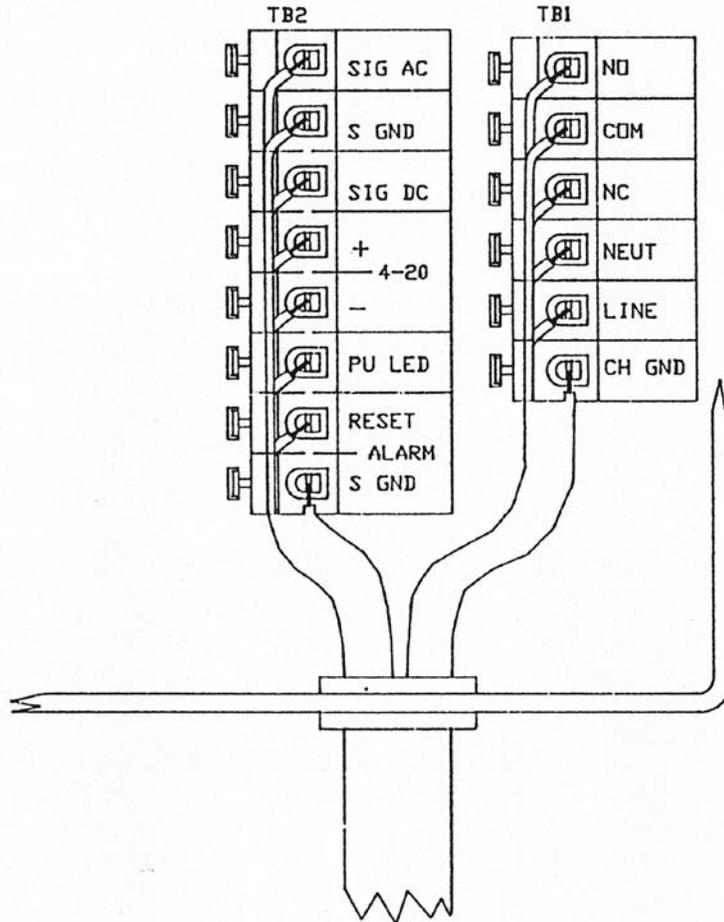


Figure 2-2, 619B Conduit Wiring Drawing

Chapter 3

Operation

The 619B Vibration Monitor is designed for monitoring vibration in remote areas. The unit has the monitoring circuits and a 115 V RMS AC power supply contained in a water-tight box.

The accelerometer is connected via a 2-pin MS connector with current to power the Integrated Circuit Pickup (ICP). The unit has an alarm that has a variable level set from .05 to 5 g's or IPS (acceleration or velocity). The alarm also has a time delay control to set from 1 to 20 second delay. The delay is the time that the Set Point on the alarm has to be exceeded to trip the alarm relay.

To set the alarm, first remove the top cover to access the inside circuit board. The cover is secured by four captive screws. Remove them and lift the cover off.

Care should be taken not to damage the rubber gasket when re-installing. To make the alarm adjustments follow the Alarm Settings. Refer as needed to the block diagram in **Figure 3-1**.

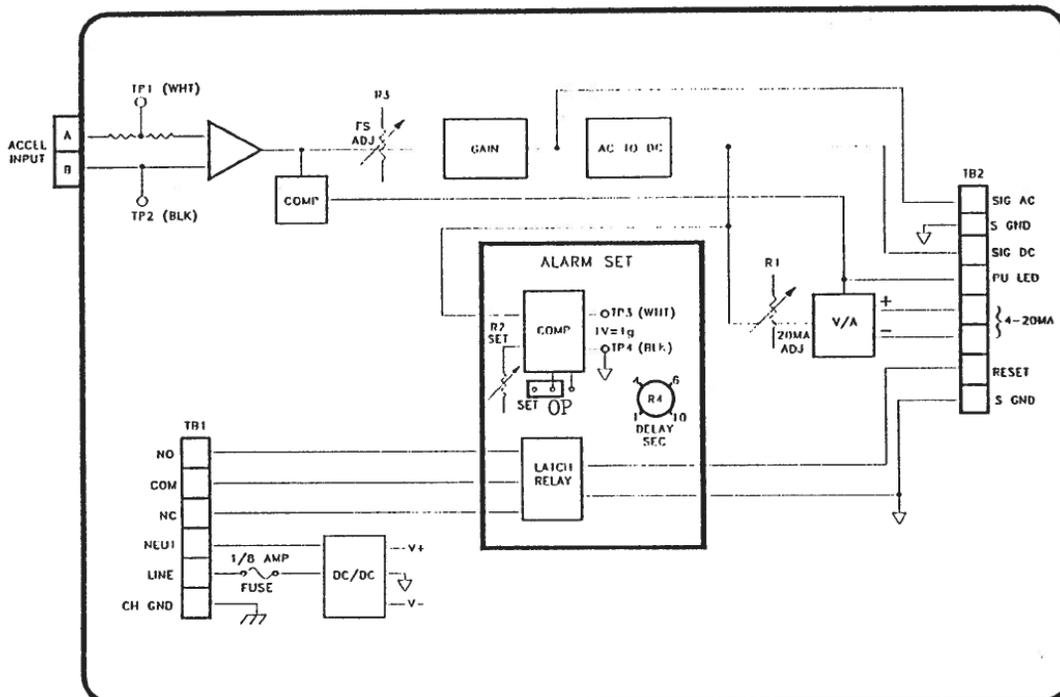


Figure 3-1, 619B Block Diagram

Alarm Settings

To set the alarm:

1. Move BLUE jumper to set position.
2. Attach DC voltmeter to TP3 (+) and TP4 (-)
3. Adjust potentiometer R2 for desired set level (1 g = 250 mV DC).
4. Move BLUE jumper back to OP position.
5. Set the Alarm Delay potentiometer R4 for 1 to 10 seconds as indicated on the Board.

Chapter 4

Performance Test

The 619B is a self-contained unit including the power supply. The following procedure outlines a method for testing the 619B and should be conducted every 12 months under normal conditions. In the event that the unit does not pass the performance test, refer to the calibration procedure in Chapter 5 of this manual.

First remove the cover by loosening the four corner screws and lifting off the lid. When the unit is installed with power, the following procedure should be done to check the alarm trip level.

Test Equipment

Note: Equivalent equipment can be used.

- | | |
|-----------------------|--------------------------------------------|
| 1. Function Generator | Trig-Tek Model 346B Synthesized Calibrator |
| 2. Multimeter | Keithley 179A |

Outputs

This part of the procedure tests the AC, DC and Current Loop Outputs.

1. Set the signal generator for 61.4 Hz and a level of 2000 mV peak, and connect the generator between TP1 (SIG) and TP2 (GND).
2. Connect the AC voltmeter to SIG AC (+) and S GND (-) and observe 5.00 \pm 0.05 V rms.
3. Connect the DC voltmeter to SIG DC (+) and S GND (-) and observe 5.00 \pm 0.05 VDC.
4. Connect the DC ammeter to 4-20 (+) AND 4-20 (-) and observe 20.0 \pm 0.2 mA DC.
5. Reduce the generator level to 0.0 mV pk, and observe 4.0 \pm 0.04 mA DC on the DC ammeter.

Sensor

This part of the procedure tests the sensor to alert the operator if the sensor shorts or open.

1. Remove the generator from TP 1 and TP2.
2. Connect the DC ammeter to 4-20 (+) and 4-20 (-) and observe 4.0 mA DC.
3. Connect the DC voltmeter to PU LED (+) and S GND (-) and observe 0.0 V DC.
4. Remove the pickup (or load) from the input and observe -10.0 ± 1.0 VDC on the DC voltmeter.
5. Short the pickup input, and observe -10.0 ± 1.0 VDC.
6. Connect the DC ammeter to 4-20 (+) and 4-20 (-) and observe 0.0 ± 0.75 mA DC on the DC ammeter.
7. Remove the short from the pickup input and observe 0.0 ± 0.75 mA DC on the DC ammeter.

Alarm Set Point

1. Refer to **Figure 3-1** in the Chapter 3, Operations. Set the alarm for 1 g or ips. *Note the level of the alarm so it can be reset to this level after the test.*
2. Set the generator for 61.4 Hz and a level of 98 mV peak.
3. Short the RESET to S GND to insure the alarm is reset. Then remove the short to arm the alarm.
4. Increase the generator to 102 mV peak.
5. Confirm the Alarm LED comes on and the contact closes.

Chapter 5

Calibration Procedure

The 619B circuitry is all-silicon solid-state device which provide stability and reliability. This unit requires $115 \pm 10\%$ VAC which is attached via the TB 1 terminal strip. For wiring connections, see **Figure 2-2**.

Test Equipment

Note: Equivalent equipment can be used.

- | | |
|-----------------------|---------------|
| 1. Function Generator | Trig-Tek 346B |
| 2. Multimeter | Keithley 179A |

Calibration Procedure

1. Connect the signal generator between pins A & B of the ACCEL INPUT connector. Set the frequency to 61.4 Hz and the LEVEL to 2000 mV peak or 1414 mV RMS.
2. Connect the multimeter between the SIG DC and S GND terminals of TB2.
3. Set the F ADJ potentiometer R3 for a 5 ± 0.02 Volts indication on the DC voltmeter.
4. Connect the multimeter to the 4-20 + and 4-20 – terminals of TB 2
5. Set the 20 mA ADJ potentiometer R1 for 20 ± 0.2 mA on the DC current meter.

Alarm Setting

The alarm set point and delay time are variable. The proper settings for these parameters are described in Chapter 3, Operations.

This page was left intentionally blank.