



**Dynamic Transducers and Systems**

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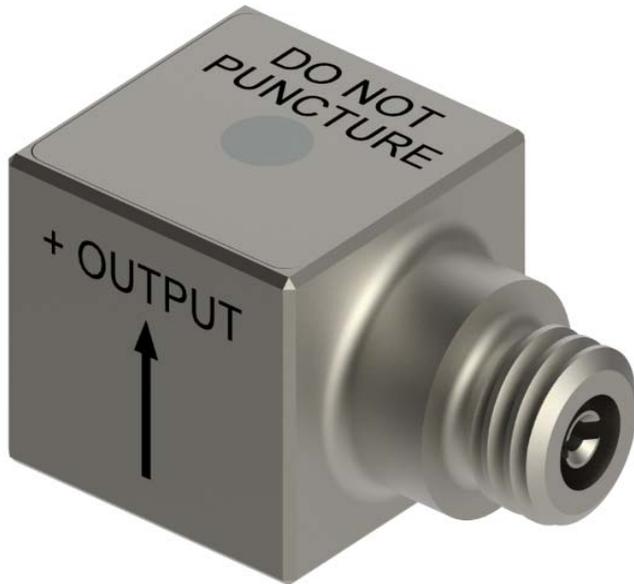
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OG3316M1  
REV A ECN 13346 04/14/17

## OPERATING GUIDE

### MODEL 3316M1

### CHARGE MODE ACCELEROMETER



**NOTE:** Model 3316M1 is a charge-mode high temp accelerometer featuring a charge-mode element with 10-32 connector mounted in an Alloy 600 housing. It has low mass and high sensitivity (1 to 2 pC/g). Planar shear design is employed for high resonant frequency.

Note: U.S. Patent number US 8,375,793 B2 applies to this unit.

## OPERATING GUIDE

### MODEL 3316M1 ACCELEROMETER

#### BEFORE OPERATING

**It is very important to read this manual before handling model 3316M1.**

In order to achieve its highest temperature specification, 3316M1 was designed with a unique feature. There is a "silver window" on the top cover of model 3316M1. Silver is a soft material in comparison to Alloy 600 which the housing is made from; therefore special care is necessary when in contact with the top cover of the unit.

Although robust, the silver window may be damaged by excessive application of force, which will void the unit's hermeticity. Even though the unit would still work, its hermeticity would be compromised, and its insulation resistance may deviate depending on the humidity level.

#### INTRODUCTION

Model 3316M1 is a miniature accelerometer using the latest in piezoelectric planar shear technology. The output is charge mode with sensitivity of 1 to 2 pC/g. The exact sensitivities are provided on the calibration sheet supplied with each instrument.

This instrument contains a piezoelectric planar shear mode accelerometer element mounted in a housing made of Alloy 600. Model 3316M1 is hermetically sealed using laser welds and ceramic-to-metal sealed connector.

Model 3316M1 mounts with a Model 6200S mounting stud, (supplied).

The element is electrically grounded to the Alloy 600 outer housing for best noise immunity.

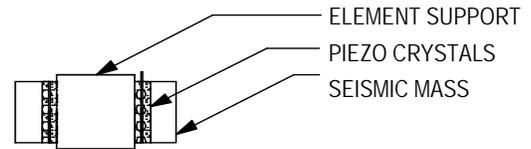
#### DESCRIPTION

Refer to the Outline/Installation drawing 127-3316M1 for the dimensions of Model 3316M1.

The electrical connection from the element is brought out to a 10-32 hermetic coaxial connector. The performance specifications and criteria for Model 3316M1 are delineated on the specification sheet supplied.

#### INSTALLATION

This accelerometer is designed to be mounted using a 10-32 mounting stud, Model 6200S, provided with each accelerometer.



**Figure 1** Representative cross section, 3316M1 element assembly.

At elevated temperatures, there is a high chance to experience a phenomena called "ground loops". Due to its miniature size, model 3316M1 has the ground connection to the housing, which is not isolated from the mounting surface. It is recommended to use model 6998 or 6959 (single and tri-axial mounting blocks respectively), to isolate the sensor from the mounting surface. This will prevent any occurrence of ground loops.

Select a smooth surface at least 3/4 in. ( $\varnothing.75$ ) in diameter and clean off all oil, debris and any contaminants or foreign matter that would preclude good contact between mating surfaces. This is important for best frequency response. Drill and tap a 10-32 mounting port at the center of the .75 diameter surface in accordance with instructions on drawing 127-3316M1, provided.

The selected (or prepared) mounting area should be flat to within .001 in TIR for best high frequency response.

**NOTE:** Before mounting, be sure to clean the mounting surface thoroughly to avoid inclusion of machining chips and other debris between mating surfaces. Intimate contact between mating surfaces is important for best performance.

Connect the accelerometer to the charge amplifier using hardline cables (6979A or 6946A Dytran model numbers) or, if the test temperature is not greater than 400°F, low noise miniature coaxial cable such as Dytran's Model 6013A (10-32 to 10-32).

If a fair amount of motion is expected during the test, it is good practice to tie the cables down to a stationary point as close as possible to the accelerometer (but not closer than 1 inch) to avoid potentially damaging cable whip.

You are now ready to connect the 3316M1 to the charge amplifier.

Since the insulation resistance of model 3316M1 at high end of its temperature range might drop to hundreds of kilohms, there is a need for special charge amplifier that would be able to accept such a low level of insulation resistance. For that purpose, Dytran model 4754B series would be a suitable choice.

## **OPERATION**

Apply power to the charge amplifiers and allow several seconds for coupling capacitors to fully charge. You are now ready to take data.

The polarity of 3316M1 is shown on the Outline/Installation drawing 127-3316M1. The arrow indicates the direction and sense of motion of the accelerometer that will produce positive-going output signal.

## **MAINTENANCE AND REPAIR**

This instrument is not field repairable. The only field maintenance required, or possible is the cleaning of contaminated connectors should this become necessary.

If a problem occurs, contact the factory for help. You will be assigned a Returned Material Authorization (RMA) number should the instrument need to be returned to the factory for evaluation. A short note describing the problem will facilitate the repair procedure.

There is no charge for evaluation of the instrument and we will perform no repair work until you are notified of any charges.

It is good practice to return the instrument to the factory for recalibration annually.