



Dynamic Transducers and Systems

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OG3153AT
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OPERATING GUIDE

MODEL 3153A1T, 3153A2T, AND 3153A3T

TRIAxIAL IEPE ACCELEROMETERS

INTERNALLY CASE-GROUND ISOLATED

WITH 4-PIN "MIGHTY MOUSE" CONNECTOR

AND IEEE 1451.4 COMPATIBLE

TRANSDUCER ELECTRONIC DATA SHEET (TEDS) FUNCTION



Note:

Model series 3153AT are miniature IEPE triaxial accelerometers featuring a single, transverse mounted, 4-pin "Mighty Mouse" connector. This feature allows these models to be used in situations where vertical space is limited. Model series 3153AT also has TEDS function which allows the user to program sensitivity, model number, serial number, and other attributes of the sensor which can later be recalled on command.

This Guide contains:

- 1) Specifications, Series 3153AT
- 2) Outline/Installation Drawing 127-3153AT

NOTE: IEPE is an acronym for Integrated Electronics Piezoelectric types of low impedance voltage mode sensors with built-in amplifiers operating from constant current sources over two wires. IEPE instruments are compatible with other comparable systems labeled LIVM™

OPERATING INSTRUCTIONS MODEL SERIES 3153AT IEPE ACCELEROMETERS

INTRODUCTION

The Dytran Model Series 3153AT consists of three accelerometers, differing only in sensitivity and range. Model 3153A1T is 10mV/g, Model 3153A2T is 50mV/g, and Model 3153A3T is 100mV/g.

Model Series 3153AT are miniature three-axis accelerometers incorporating the latest in piezoceramic planar-shear technology. The "T" designation denotes the inclusion of the IEEE 1451.4 Transducer Electronic Data Sheet or "TEDS" function. This function allows the user to query each sensor in a large array of sensors, say, in a large field test, as to model number, serial number, sensitivity and other attributes using a TEDS compatible signal conditioner/data acquisition system.

These sensors contain three miniature piezoceramic planar-shear mode elements mounted onto a single ground-isolated support and welded into a stainless steel housing. These three elements are mounted orthogonal to each other in order to measure the complete motion of a point.

Weighing at only 35 grams, model series 3153AT can be stud mounted into very small spaces due to its vertical dimension of .60 in.

IEPE (Integrated Electronics Piezoelectric) design means that three miniature charge amplifiers are built into the instrument, one for each axis, to lower the impedance of the piezoceramic elements by many orders of magnitude. This technique allows the driving of long cables without affecting sensitivity and the use of very simple constant current type power units.

All elements are internally isolated from the outer case and are enclosed by a faraday shield for improved noise immunity.

DESCRIPTION

Refer to the outline/installation drawing **127-3153A1T** for overall model dimensions.

The electrical connections from the charge amplifiers for each element are brought out to the contacts of a single four-pin "Mighty Mouse" connector mounted transversely to one vertical face of the housing. The three signal/power connections to the elements are connected to each of three pins while the three ground returns for the elements are tied together to one common pin of the four-pin connector. The case of this instrument is also electrically isolated from electrical signal/power ground.

The performance specifications and criteria for Series 3153AT are delineated on the specification sheet included with this operating guide.

INSTALLATION

These accelerometers are designed for stud mounting. If the accelerometer is mounted on any other surface, its calibration cannot be guaranteed.

Select a smooth surface approx. 5/8" in diameter and clean off all oil, debris and any contaminants or foreign matter that would preclude a good coupling.

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 or other debris between mating surfaces. Intimate contact between mating surfaces is important for best performance.

If a fair amount of motion is expected during the test, it is good practice to tie the cable 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 accelerometer to the power unit.

OPERATION

The sensitivities of each of the three axes are directly in mV/g and are specified precisely in the calibration certificate supplied with each instrument.

Be sure to check the orientation of each axis with the markings on the instrument's upper surface and/or the outline/installation drawing supplied with this Operating Guide. The polarity of each axis is also defined with arrows engraved into the top surface of the accelerometer and, delineated on the outline/installation drawing 127-3153A1T.

The arrows indicate the direction and sense of motion of the accelerometer that will produce positive-going output signals. The vertical axis, axis Z, produces positive-going output voltage when the accelerometer is accelerated upward, i.e., away from the mounting surface.

REMOVAL (OR UN-INSTALLATION)

It is very important when removing this instrument to remember that, although it is built to be very rugged, it is a sensitive measuring instrument and as such should be treated gently when being removed from its installation. Never strike the unit to break it free from its mounting surface. Simply grip two opposing flats with an adjustable or open-end wrench and gently twist the instrument. This method avoids any trauma to the instrument and will help ensure a long life for the accelerometer.

MAINTENANCE AND REPAIR

This instrument is not field repairable. No maintenance is required, or possible. If a problem occurs, contact the factory for help. You will be assigned a Returned Material Authorization (RMA) number should the instrument have 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 from time to time with frequency of recalibration dependent on usage intensity and frequency.