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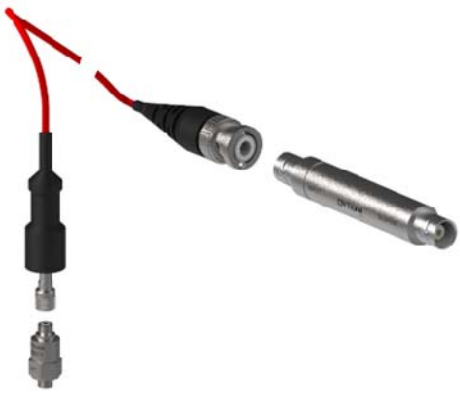
SUPPLEMENTAL OPERATING INSTRUCTIONS

MODEL 5310M1

HIGH TEMPERATURE VIBRATION MEASUREMENT SYSTEM



NOTE:
Model 5310M1 is a vibration measurement system consisting of a Model 3030C1 charge mode miniature accelerometer, a Model 4705M13 in-line charge amplifier and a Model 6019B10 low noise treated cable with environmental sealing boot.

THIS MANUAL CONTAINS:
1) Operating Guide Model 4705M13 charge amplifier
2) Operating Guide Model 3030C1 accelerometer
3) General Guide to Charge Mode Accelerometers
4) General Guide to In-Line Charge Amplifiers
5) Outline/Installation Drawing 127-5310M1 system
6) Outline/Installation Drawing, 127-6549 sealing boot

*__NOTE: LIVM__ is Dytran's trademark for its line of **L**ow **I**mpedance **V**oltage **M**ode sensors with built in amplifiers operating from constant current sources over two wires. **LIVM** instruments are compatible with most other manufacturers' comparable systems.

SUPPLEMENTAL OPERATING GUIDE

MODEL 5310M1 HIGH TEMPERATURE VIBRATION MEASUREMENT SYSTEM

INTRODUCTION

Model 5310M1 is a vibration measurement system which combines a high temperature miniature charge mode accelerometer with an in-line converter type charge amplifier. Also included is a low-noise interconnect cable with environmental sealing boot. This system is especially suited for use in ESS (Environmental Stress Screening) chambers and for environmental test chambers in general.

This system allows the user to enjoy the simplicity of Low Impedance Voltage Mode operation with the high temperature performance of a charge mode piezoelectric accelerometer.

The in-line charge amplifier, Model 4706M13 converts the high impedance charge output of the piezoceramic accelerometer, Model 3030C1, to low impedance, constant current (IEPE) operation. The system is supplied with charge amplifier, accelerometer and cable (with sealing boot) ready to assemble, install and connect to the constant current power source. Power source and readout instrument are not supplied.

DESCRIPTION

Refer to Outline/Installation Drawing 127-5310M1 for an overview of the system. Refer to Outline Installation Drawing 127-3030C1 and 127-4705M13 for dimensional details of the accelerometer and the charge amplifier.

The miniature, rugged charge mode accelerometer, Model 3031C1 is connected to the input of charge amplifier, Model 4705M13 with a 10-foot coaxial cable, Model 6019B10. This cable assembly uses low-noise treated coaxial cable and comes supplied with an environmental boot (Model 6549) which is captivated on the cable assembly and which slides over the entire body of the accelerometer effecting a very efficient environmental seal.

The low-noise cable minimizes spurious triboelectric noise which is electrical noise generated by motion of the cable. Untreated cable can generate electrostatic noise from the insulation

layers of the cable rubbing together. The boot protects the accelerometer and cable connection from moisture from environmental chambers and other sources.

In use, the Output connector of the charge amplifier is connected to a constant current source type power unit. Dytran's trade name for this type of operation is IEPE standing for Integrated Electronics Piezoelectric. Other manufacturers have various other trade names for similar systems. Most of these types of systems are compatible with each other.

Signal and power to (and from) the charge amplifier are conducted over two leads (in most cases, with coaxial cable). The Signal/Power connector of the 4705M13, which is connected to the power unit, is a BNC jack.

INSTALLATION

First, install the 3030C1 accelerometer in accordance with instructions given in the Operating Guide for Model 3030C1. In general, this consists of drilling and tapping the 10-32 mounting port and cleaning the area of burrs and other contaminants.

After installing the accelerometer, connect the 6019B10 cable, threading the 10-32 cable nut onto the accelerometer connector tightly by hand. Do not use pliers to tighten this cable nut as this could damage the cable or accelerometer connector.

For a guide to the installation of the sealing boot, the enclosed drawing 127-6549 will be helpful.

Slide the sealing boot (which is captivated on the cable assembly) forward toward the accelerometer and over the accelerometer body. Slide the boot forward over the body of the accel. as far as it will go. Since the boot is tightly stretched over the cable O.D., it will take some effort to slide the boot forward. When properly seated, it should completely cover the accel. body. The sealing boot has been pre-lubricated at the factory with silicone grease to facilitate sliding the boot over the cable and the accelerometer. After several installations, it will be may be necessary to re-lubricate the cable and connector body with a light coating of silicone grease.

If high excursions of the accelerometer are expected, it is good practice to tie the cable to stable structure within several inches of the accelerometer to avoid excessive cable motion.

Now connect the BNC end of the cable to the “Input” BNC of the charge amplifier. Be sure to look for the “INPUT” designation on the body of the charge amplifier to ensure that you have the proper connector since the Sig/Pwr connector of the charge amp. is also a BNC jack.

POWERING

Power the system by connecting the Sig/Pwr BNC connector to a Dytran IEPE (constant current) power unit, or equivalent, using and appropriate BNC coaxial cable. The power unit must be current limited over the range of 2 to 20 mA. The suggested current level for this system is 4 mA.

NOTE: Under no circumstances should the signal/power jack be connected to a source of DC power that **does not** have current limiting (such as a battery or a DC power supply). This will immediately destroy the circuitry of the in-line charge amplifier.

OPERATING THE SYSTEM

The system output sensitivity is given in mV/G and is specified on the calibration certificate supplied with your system. The basic sensitivity of the 3030C1 is 0.4 pC/G and the basic sensitivity of the 4705M13 is 25 mV/pC. Multiplying these sensitivities together yields 10 mV/G as a nominal system sensitivity. The actual calibrated sensitivity will be found on the calibration certificate supplied with each system.

Connect the output jack of the power unit to the readout instrument, allow several seconds for bias level to stabilize and you are ready to record data.

MIXING SYSTEM COMPONENTS

Do not mix components from different 5310M1 systems as the system sensitivity will be in doubt. since there are small differences in the actual sensitivities of all system components. For this reason, each system is calibrated as an individual set of components and so identified.

MAINTENANCE AND REPAIR

Because of the sealed construction of these system components, maintenance is limited to keeping connections clean. Since the output of the 3030C1 is high impedance charge mode, the connector and cable must be kept clean and free of moisture and other contaminants. From time to time, between uses, it is good practice to wipe the connector insulator of the 3030C1 with a clean wipe dipped in alcohol or other solvents (not acetone) and bake in a 250° oven for about an hour. The cable ends may also be cleaned in this manner.

Should a problem arise with the system, contact the factory for assistance in troubleshooting or for instructions in returning the system to the factory for evaluation, should this be deemed necessary. There is no charge for evaluation and if the system is under warranty, there is no charge for warranty repair. In either case, no work will be performed until a cost estimate is submitted and the customer gives approval.