This document illustrates the main steps involved in the installation of VibroSystM equipment.

Keep in mind that only a general overview is presented, as this document is intended for planning purposes only. Concerns about safety issues or specific installation considerations are not included.

For safe operation and to ensure that your system functions at its optimum capability, the installation and adjustment process should be handled only by VibroSystM trained service specialists.

797L Piezoelectric Accelerometer

Installation Manual

(Product # 9400-09M3A-101)

This manual divides into the following sections:

Section 1: Installation of the Piezoelectric Accelerometer and Cable

Section 2: Datasheet:

- 797L Piezoelectric Accelerometer

INSTALLATION OF 797L PIEZOELECTRIC ACCELEROMETER AND CABLE

Preliminary considerations

- The 797L piezoelectric accelerometer is a solid-state device with an isolated piezoceramic sensing element capable of detecting low to mid-level displacements in the same axis as the mounting hole on slow to medium speed machines. It contains no moving parts and can be oriented in any direction.
- Operates under most harsh environmental conditions.
- Unaffected by dirt, oil, and most chemical atmospheres.
- The piezoelectric membrane minimizes the effects of transverse motion, base strain, and thermal transients.
- The flat frequency response is from 1 Hz to 500 Hz.

- The mounting location must be chosen according to application. Absolute shaft vibration measurement applications will require that the accelerometer be mounted on the same support structure and in the same axis as the proximity probe.
- The 797L piezoelectric accelerometer is shipped with a captive screw for stud mounting. In selecting mounting location, pay attention to accessibility.
- The accelerometer must in most cases directly contact the machine surface.

If the accelerometer is installed on an insulated bearing, a nonconductive mounting support must be used to preserve the integrity of insulation.

- The closer the contact is between the accelerometer and the machine, the better the ability to couple and measure high frequency signals. Best efforts must be made to provide a flat, smooth, and even mounting surface by spot facing the location. The tapped hole must be perpendicular within 1° to the mounting surface.
- Avoid mounting the sensor on thin sections or vibration-free areas.
- Excessive mechanical shock from hard impacts can destroy the internal electronic components or fracture the piezoelectric crystal. **Avoid dropping the accelerometer**.

ACCELEROMETER INSTALLATION

Supplies needed:

- Mounting screw 1/4-28 UNF or M6x1
- Loctite 222 thread adhesive

Tools needed:

- Drill bits 7/32'' or 5mm
- Tap drills 1/4-28 UNF or M6x1
- Torque screwdriver

Caution: Use great care in handling the Model 797L accelerometer. NEVER DROP it or hit it against a solid object. Keep it stored in its box until you have surveyed and prepared the location suitable for installation.

Step 1) Preparation of the mounting area

1. Select the best mounting location according to your application (refer to preliminary considerations). Prepare the surface and mounting hole according to Figure 1 a) if the screw has UNF thread or Figure 1b) if the screw has a metric thread.

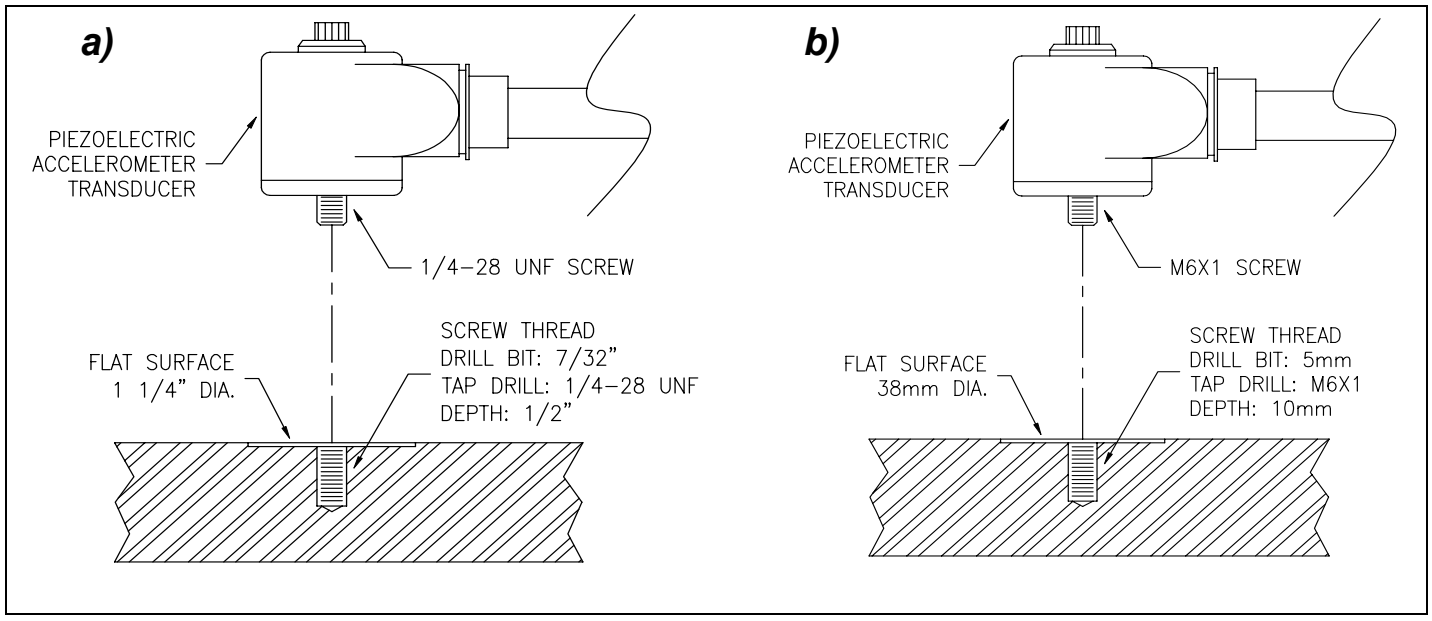


Figure 1

Step 2) Mounting the accelerometer

1. Mount the accelerometer using a torque screwdriver for tightening. The supplied captive screw should be torqued to a nominal value of 3,3895 Nm (30 lb-in). Under-torquing the accelerometer reduces the stiffness of the coupling, while over-torquing can cause permanent thread damage.

   Note: Use Loctite 222 thread adhesive for better results.

Installation on an insulated bearing

If the sensor is installed on an insulated bearing, special care must be taken to preserve the insulation of the bearing.

The most widely recommended mounting method consists in placing a 0.063 in. thick mica sheet between mounting bracket and bearing, and using non-metallic screws.

E251105A

1. Shown here is an alternate mounting method. The sensor is installed on an insulating block.

E251105B

2. Glue is applied on the block and insulated surface.

E251105C

3. The sensor is held in place until the glue has set. The sensor can be mounted vertically or horizontally.

CABLE INSTALLATION

Preliminary considerations

- This twisted pair, shielded, yellow teflon cable is 5 m (16 ft.) long and will run between the piezoelectric accelerometer and the PCU-100 Unit.
- In applications of 500 Hz maximum frequency such as the ones this accelerometer is designed for, the cable capacitance of 30 pF per foot allows the cable to run over a total length of 100 m (330 ft.). For applications involving a cable longer than 5 m (16 ft.), a tapping box is needed.
- The cable should be enclosed in a protective conduit.

Step 1) Installation of the cable

1. Determine the run of the cable, keeping in mind that its maximum length is 100 m (330 ft.).
2. Unroll the protective conduit following the planned course of the cable. Cut the conduit to desired length.
3. With a fish tape, carefully pull the cable into the conduit. The socket connector must be placed on the accelerometer side.
4. Connect the cable to the accelerometer.

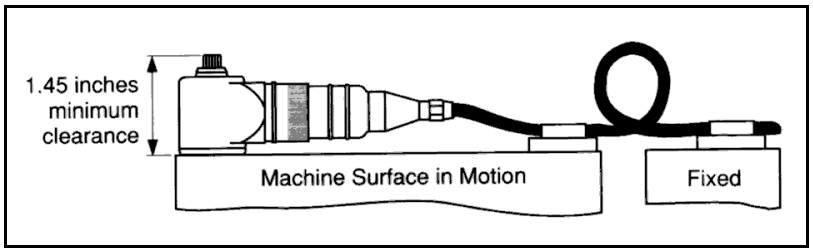


Figure 2

5. Anchor the cable to reduce stress at the cable terminations. When securing the cable, leave enough slack to allow free movement of the accelerometer as shown in Figure 2.

Step 2) Connection of the power and output cable

1. Connect the wires according to the following designation:

PIN #	WIRE COLOR	DESIGNATION
A	White	Power/signal
Shell	Shield	Ground
B	Black	Common

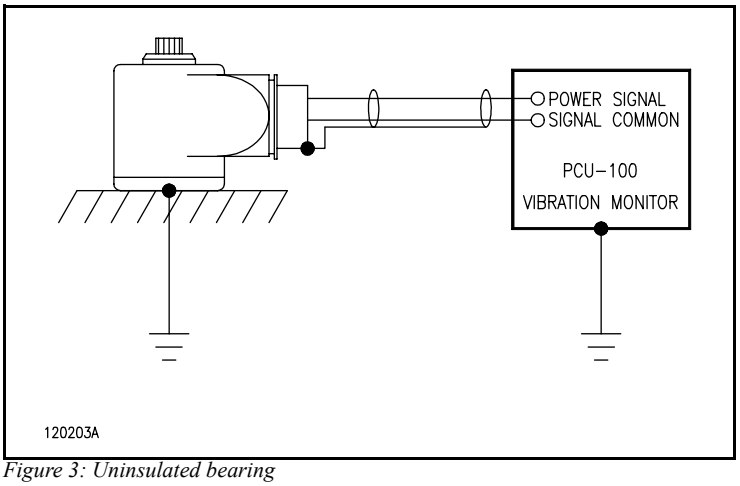


Figure 3: Uninsulated bearing

a) Uninsulated bearing

The housing of the accelerometer is connected to ground: do not connect the cable shield-to-ground at the monitored end.

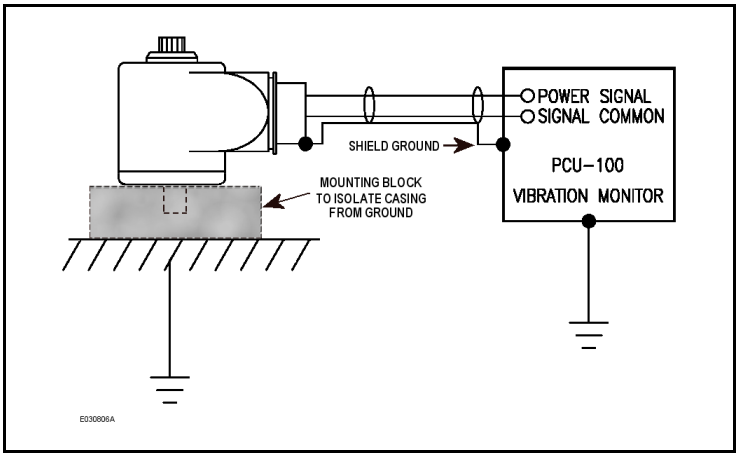


Figure 4: Insulated bearing

b) Insulated bearing

The housing of the accelerometer is isolated from ground: connect the cable shield-to-ground at the monitored end.

Step 3) Verification

1. Verify that the 797L piezoelectric accelerometer is functioning well: measure the voltage at the output of the accelerometer (e.g. between black and white wires, at input of the PCU-100 unit). Note that the warm-up time is about two minutes. The bias voltage (or voltage at rest) should be about 10 V_{DC} (+/- 1v).
2. Much lower or higher DC bias voltages indicate internal problems and the accelerometer should be carefully packed and returned to the factory for repair.

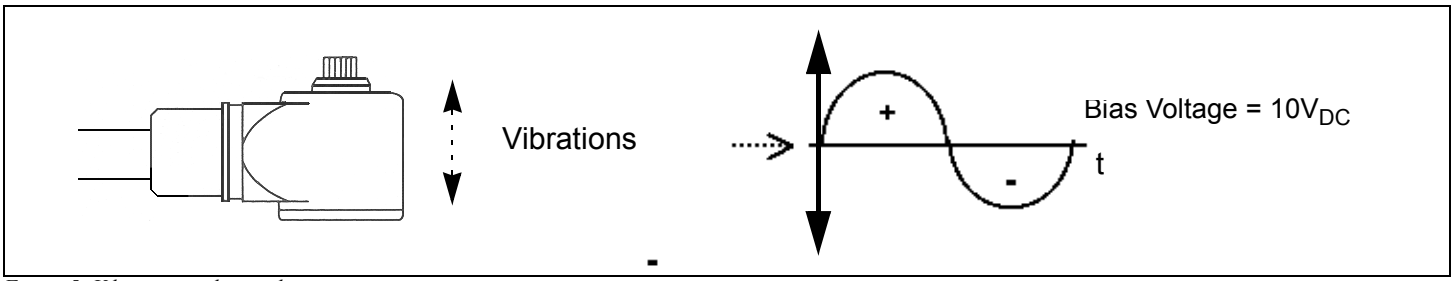


Figure 5: Vibrations to bias voltage

VIBROSYST M

Model 797L

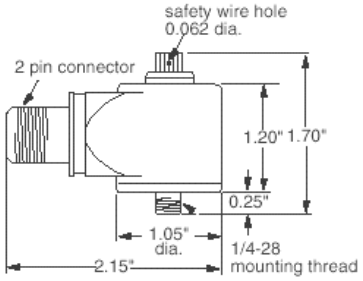
Premium, Low Frequency, Center Mount Accelerometer

DYNAMIC		
Sensitivity, ±5%, 25°C		500 mV/g
Acceleration Range		10 g peak
Amplitude Nonlinearity		1%
Frequency Response:		
–5%		0.6 - 850 Hz
–10%		0.4 - 1,500 Hz
–3 dB		0.2 - 3,700 Hz
Resonance Frequency		18 kHz
Transverse Sensitivity, max		7% of axial
Temperature Response		–50°C –8% +120°C +5%
ELECTRICAL		
Power Requirement:	voltage source	18 - 30 VDC
	current regulating diode	2 - 10 mA
Electrical Noise, equiv. g:		
Broadband	2.5 Hz to 25 kHz	12 µg
Spectral	2 Hz	2.0 µg/√Hz
	10 Hz	0.6 µg/√Hz
	100 Hz	0.2 µg/√Hz
Output Impedance, max.		100 Ω
Bias Output Voltage		10 VDC
Grounding		case isolated, internally shielded
ENVIRONMENTAL		
Temperature Range		–50 to 120°C
Vibration Limit		250 g peak
Shock Limit		2,500 g peak
Electromagnetic Sensitivity, equiv. g		5 µg/gauss
Sealing		Hermetic
Base Strain Sensitivity		0.001 g/µstrain
PHYSICAL		
Sensing Element Design		PZT ceramic / shear
Weight		148 grams
Case Material		316L stainless steel
Mounting		1/4-28 captive socket head screw
Mating Connector		R6 type
Recommended Cabling		J9T2A

CONNECTOR PIN	FUNCTION
SHELL	ground
A	power/ signal
B	common

FEATURES:

- High sensitivity
- Ultra low-noise electronics for clear signals at very low vibration levels
- Low pass filtered to attenuate high frequencies
- Hermetic seal
- ESD protection
- Miswiring protection
- Reverse wiring protection



ACCESSORIES SUPPLIED: #12105-01 captive socket head (International customers specify mounting requirements); Calibration data (level 3).

OPTIONS: Intrinsic safety certification

FM APPROVED

Optional Safety Approvals