ST6911 IPT™ ACCELERATION VIBRATION TRANSDUCER
ST6917 IPT™ VELOCITY VIBRATION TRANSDUCER

Installation Manual

CE

OVERVIEW

Capable of sensing a wide range of vibration frequencies, the ST6911 and ST6917 are ideal for a variety of machines. With both models, a built-in amplifier provides a high level, low impedance 4-20 mA output to interface with PLC, DCS, or 4-20mA monitors. Both models incorporate a temperature stabilized circuit and amplifier, packaged in a stainless steel case designed to operate continually in a wet, corrosive environment of 100°C (212°F). The sensing circuit is electrically isolated to 500vrms. Although shipped standard with a 1/4-28 to 1/4-28 mounting stud, other mounting configurations are available. Signal wiring is made mistake proof with the IPT™ (Independent Polarity Terminal) feature making the transmitters indifferent to wiring reversal.

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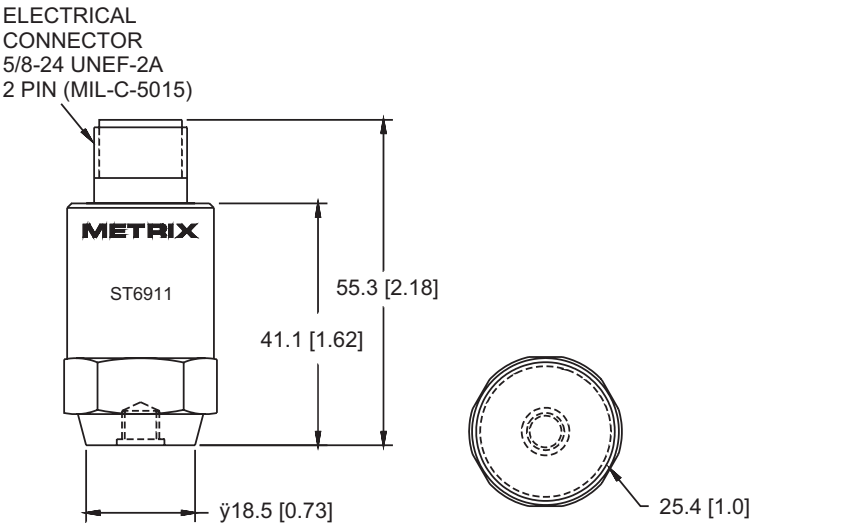
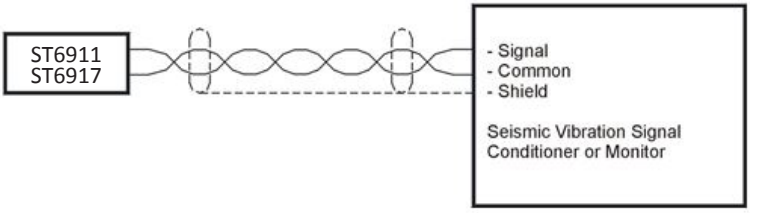
OUTLINE & DIAGRAMS



Units: mm [in]
Weight: 91 g (3.2 oz)

WIRING DIAGRAM



NOTE: Ground the shield at transducer or instrument, NOT BOTH!

WIRING

The ST6911/ST6917 is connected like any other loop powered transmitter. Connect the field wiring in accordance with the wiring diagram shown above. The ST6911/ST6917 transmitter requires a minimum of 10 VDC for proper operation. The minimum loop power supply voltage required is 10 VDC plus 1 volt for each 50 Ω of loop resistance.

ST6911/ST6917 Example:	Signal wire resistance	= 10 Ω
	Resistance of receiver	= 250 Ω
	Total loop resistance	= 260 Ω

Minimum supply voltage = 260 (1V/50 Ω) + 10V = 15.2 VDC

The maximum loop power supply voltage that may be applied is 30 VDC. The maximum loop resistance (R_L) is calculated by the equation:

R_L = 50 Ω/V (VS - 10V) Ω
Example: R_L = 50 (24 - 10) = 700 Ω for 24 VDC loop supply.

CONNECTION TO PLC OR OTHER INDICATING INSTRUMENT

The first step in configuring the PLC, DCS, or other recording instrument is to determine the source of power. The ST6911 and ST6917 requires loop power be supplied to them. Some Analog Input channels, on a PLC or DCS, for example, provide this power from within. If they do not provide power, an external power supply must be provided. Connect the transmitter field wiring using standard instrumentation practices.

Scaling of the display is on the basis of the range of the transmitter. For the ST6911, the measurement parameter name is "vibration" and the units are "g" (1g= 386 inches per square second). The example below is based on a standard 10 g transmitter. For the ST6917, the measurement parameter name is "vibration" and the units are "ips" (inches per second) or "mm/s" (millimeters per second). The example below is based on a standard 1.0 ips transmitter.

Model	Vibration Level	Transmitter Output	PLC (or other) Scale
ST6911	None	4mA ± 0.1mA	0.00 g's
	10 g's	20mA ± 0.4mA	10 g's
ST6917	None	4mA ± 0.1mA	0.00 ips
	1.0 ips	20mA ± 0.4mA	1.00 ips

In order to prevent nuisance alarms, due to transient operating conditions, program a time delay into the alarm. Momentary "jolts" that can occur at start-up or during some operating condition changes, do not reflect a machine steady state operating condition. The indicated vibration level must cross the threshold level and stay above it for a preset time before any alarm action is taken. A 2- to 3-second delay is normally applied to most machinery.

Some rough starting machinery may also need a start-up time lockout for alarms. A start-up lockout is different than a time delay! Both may be needed.

TYPICAL TRANSMITTER PLACEMENT

Both transducers measure seismic vibration at the attachment point on the machine. Their sensitive direction is through their cylindrical bodies. They will not measure side to side motion. The ST6911 measures acceleration vibration in g's (peak or RMS). The ST6917 measures velocity vibration in ips (inches per second). Both, acceleration and velocity vibration are common measurement for a large variety of machinery.

Typical transmitter mounting for casing vibration measurements is in the horizontal direction at the bearing housings. Usually the horizontal direction is more sensitive because of the way machinery is typically mounted.

CALIBRATION

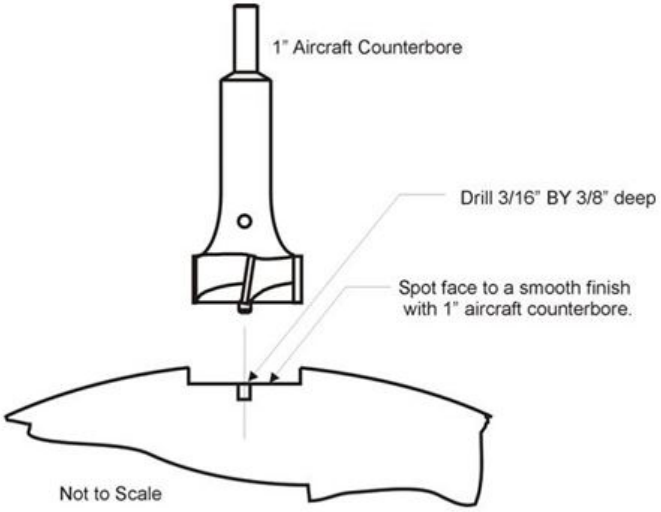
The ST6911 and ST6917 transmitters have been factory calibrated for the full scale vibration level marked on the label. If the calibration is in doubt the unit can be verified in the field by following the procedures outlined below. Note that there are no Zero and Span adjustments on the transmitter.

1. Zero Verification In the absence of vibration the output current should be 4 mA ±0.1 mA. If the ambient vibration is more than 2% of full scale, the transmitter should be removed from the machine and placed on a vibration free surface for this measurement. Often a piece of foam can be used to isolate the transmitter from external motion.

2. Span Verification Subject the transmitter to a known vibration within the full scale range marked on the label. If using a portable vibration shaker where it can be tested at full scale, the output should be 20 mA ± 0.8mA. If using another reference, like a similar machine, calculate the current value on a proportional basis.

The output level can also be compared to a vibration level read on a portable vibration meter. This reading should be taken as close to the transmitter location as possible.

NOTE: If you shake the transmitter by hand you can produce a high output. There is no way of knowing the expected output when shaking it by hand.

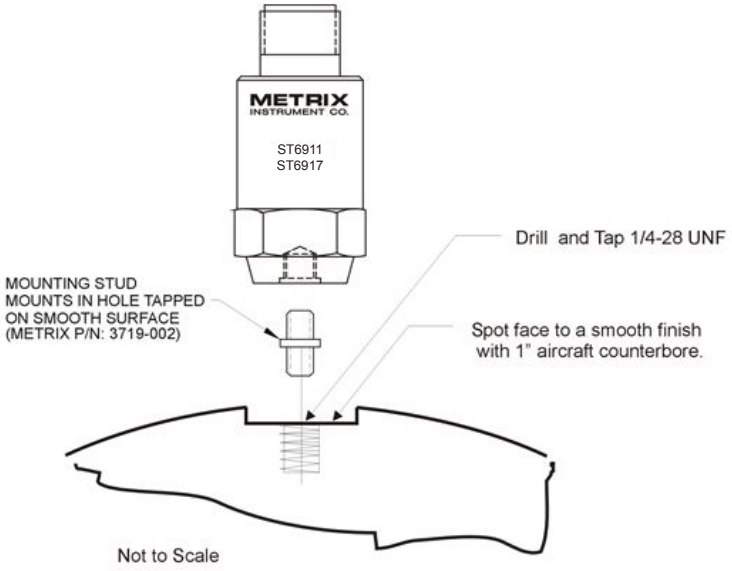


TOOL LIST FOR STUD MOUNTING

1) Half inch variable speed Drill Motor.
2) 3/16" (#12) drill bit.
3) 7/32" (#3) drill bit.
4) 1" Aircraft Counterbore with 3/16" pilot.
5) 3/32" Allen Wrench.
6) Cutting fluid, Tap Magic or equal.
7) Torque wrench calibrated in inch pounds.
8) 1/4"-28 UNF taper and bottom tap.
9) 7/8" crow foot attachment.
10) Tap handle.
11) Small ball peen hammer.
12) Center punch.
13) Light Oil.

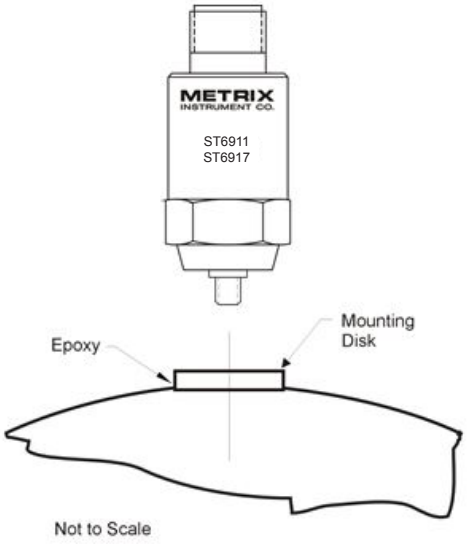
INSTALLATION PROCEDURE

1) Center punch hole location.
2) Drill 3/16" diameter by 1/2" deep hole on punch mark.
3) Remove metal shavings.
4) Using the 3/16" hole as a guide, spot face to the depth required for a flat mounting surface.
5) Drill out the center hole using the 7/32" (#3) drill bit
6) Tap hole with 1/4-28 UNF tapered tap.
7) Remove tap and metal shavings.
8) Continue tapping 1/4-28 UNF bottom tap.
9) Remove tap and deburr.
10) Remove metal shavings.
11) Apply a light oil to accelerometer stud and mating surface.
12) Install accelerometer, torque between 18 and 22 in/lbs.



TRANSMITTER MOUNTING ON MACHINE SURFACE

1) Verify mounting surface and tapped hole is free of Burrs and debris.
2) Verify mating surfaces are flat and perpendicular with the 1/4-28 threaded hole.
3) Coat mating areas and threads with thin film of oil.
4) Hand tighten the accelerometer and 1/4-28 stud to the machine taking care to see that nothing is trapped between the mating surfaces.
5) Torque accelerometer between 18 and 22 inch-pounds.



TRANSMITTER MOUNTING ON DISK

1) Remove all paint, dirt and grease from desired mount area.
2) Wash area with a degreaser.
3) Mix epoxy as directed, applying to the desired area.
4) Degrease the disk and set in the epoxy with 3-5 pounds of weight applied to top side of the disk.
5) After the epoxy cures, apply a film of light oil on the 1/4-28 stud and disk surface.
6) Mount the transmitter on the disk and torque to about 20 inch-pounds.

ENVIRONMENTAL INFORMATION

This electronic equipment was manufactured according to high quality standards to ensure safe and reliable operation when used as intended. Due to its nature, this equipment may contain small quantities of substances known to be hazardous to the environment or to human health if released into the environment. For this reason, Waste Electrical and Electronic Equipment (commonly known as WEEE) should never be disposed of in the public waste stream. The "Crossed-Out Waste Bin" label affixed to this product is a reminder to dispose of this product in accordance with local WEEE regulations. If you have questions about the disposal process, please contact Metrix Customer Services.

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