FLUKE®

Vibration Tester

810

14 Easy steps to vibration

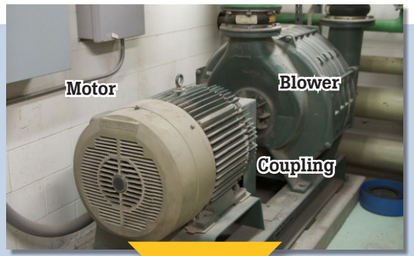
How to Answer the Setup Questions for a Vibration Test with the Fluke 810 Vibration Tester

The Fluke 810 Vibration Tester can accurately diagnose a wide range of machine conditions, but to do so it must have a complete and accurate description of the components being tested and how they are configured.

To gather the required information quickly and conveniently, the Tester asks a series of questions about the following when you set up a new test:

- The motor that drives the system
- The couplings and transmission
- The driven component

As you answer these questions, the Fluke 810 Vibration Tester displays an image of the system that you have described so you can be sure that it has an accurate representation.



Entering Motor Information

Entering an accurate running speed (RPM) is critical to receiving a proper diagnosis.

The Fluke 810 Vibration Tester uses the running speed that you enter to analyze vibration information and to give you an accurate diagnosis. Entering an incorrect running speed significantly reduces the accuracy of the tester. Use the keypad of the Fluke 810 Vibration Tester to enter the running speed. (Figure 1)

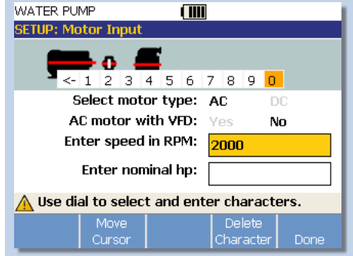


Figure 1

Getting the speed information for constant-speed motors

You can get the speed of a constant-speed motor from the motor nameplate or the motor manual. You can also measure RPM with tachometer supplied with the Fluke 810.

Getting the speed information for variable-speed motors

You can get the speed of a variable-speed motor from:

- The tachometer supplied with the Fluke 810 Vibration Tester
- A separate strobe or contact tachometer
- The information listed on the variable frequency drive

To get consistent diagnoses on motors controlled by variable speed drives (VFDs), it may be necessary to reduce or increase the load on the motor to get the motor speed to match the speed at which previous measurements were made. If you can manually adjust the VFD, set the VFD to its maximum output speed (50Hz or 60Hz).

To calculate motor speed from the VFD output setting, use the following formula:

VFD output frequency / motor nameplate frequency × motor nameplate speed = motor speed

For example, if the motor nameplate tells you that that motor speed at 60 Hz is 1,775 RPM and you set the VFD to 60 Hz, the motor runs at its nameplate speed:

60 Hz / 60 Hz × 1,775 RPM = 1,775 RPM

If you reduce the VFD to half the previous output frequency, the motor runs half as fast:

30 Hz / 60 Hz × 1,775 RPM = 887 RPM

Using the Machine Setup Wizard

When you set up a machine for measurement and diagnosis using the Machine Setup Wizard, answer each question carefully and correctly, based on your knowledge of the machine to be tested. If you are unsure about how to interpret the questions asked by the Machine Setup Wizard, refer to the Fluke 810 Users' Manual or this guide.

- Use the Dial on the Fluke 810 to highlight your choice. (Figure 2)
- Use the softkeys to select the component, and then press Enter (Figure 3)

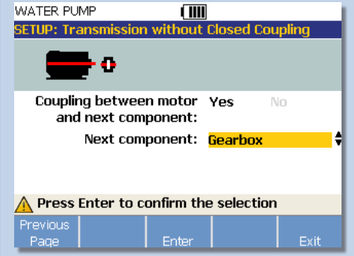


Figure 2

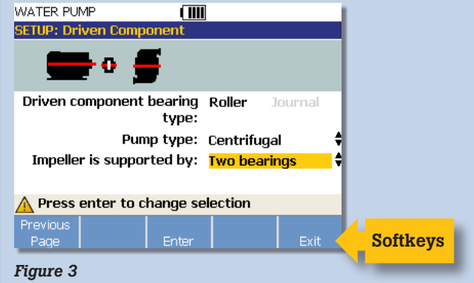
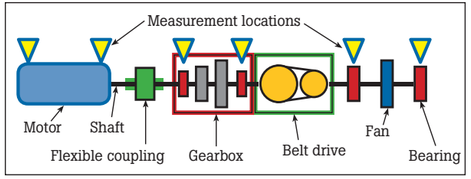


Figure 3

Answering the Setup Questions

Use the Fluke 810 User's Manual and this guide to help answer the setup questions required for each test.

Symbols used in this guide



Setup Questions and Results

Create A New Machine Setup		Answers And Diagrams
1.	Push **New Machine** on the startup screen. Or push **SETUP**.	Use the Dial to select and enter characters.
2.	**Enter a machine name:** Enter a descriptive name for the machine, for example, B5 Supply Fan 3.	A maximum of 15 characters is allowed.
Machine Setup Questions		
1.	**Select motor type:** AC DC	**Roller or Journal Bearings**
2.	**AC motor with VFD:** Yes No Select a variable frequency drive ("Yes") or a constant speed motor ("No").	**Roller Bearing** Roller bearings support a load with round rolling elements
3.	**Enter speed in RPM:** Enter the speed from the motor's nameplate or the tachometer.	**Journal Bearing** Journal bearings support a load without round rolling elements
4.	**Enter nominal hp (kw):** Enter the horsepower or kilowatts listed on the motor's nameplate. Press **Next Page**.	***If in doubt, select Roller Bearings.***
5.	**Motor mounted:** Horiz/Vert Specify whether the motor shaft is horizontal or vertical.	
6.	**Motor bearing type:** Roller/Journal Choose roller or journal bearings.	

7.	**Motor detached from drive train?** Answer **NO unless:** **a.** The driven component is physically disconnected from the motor ***– or –*** **b.** You want to test only the motor and not any attached components. (If a or b is true, answer YES).	**Detached Motor**
8.	**Motor Close Coupled?** Answer **NO unless:** **a.** The motor shaft is driving the driven component directly ***– and –*** **b.** The only bearings are on the motor shaft (for example, when the motor is bolted directly to a fan, a pump, or a compressor) Then, answer **YES**.	**Motor Close Coupled** Also called "direct mount" or "direct drive," a motor is "close-coupled" if: • There are no bearings on the driven unit. • There is only one shaft running at one speed
9.	**Coupling between motor and next component?** **Flexible Coupling** If there is flexible material between the flanges of the coupling, answer **YES**. **Rigid Coupling** Otherwise, if the coupling is rigid and the flanges are bolted together with no flexible material, or no coupling, answer **NO**. **Next component:** Press **Enter** on the center of the Dial, rotate the Dial, and select the driven unit. ***If the driven unit is a gearbox, go to step 11. Otherwise, go to step 12.***	**Flexible or Rigid Coupling Regardless of coupling type:** • There are bearings on both the motor and the driven shafts • There are two shafts, both running at the same speed **Flexible Coupling** **Rigid Coupling** ***If in doubt, select Flexible Coupling.***

10.	**Coupling between motor and next component?** Answer "**No**." **Next component: Belt Drive** Press Enter on the center of the Dial, rotate the Dial, then select **Belt Drive**. **Input shaft speed:** Enter the motor shaft speed. **Output shaft speed:** Enter the driven unit shaft speed. **Rotation speed (optional):** Use a strobe or contact tachometer to measure the speed of the belt. **Next component:** Press **Enter** on the center of the Dial, rotate the Dial, then select driven unit. ***If the next component is Gearbox, skip to #13.***	**Belt driven machine** • Bearings on motor and driven shafts • Two shafts with different speeds
11.	**After completing the steps in #9: Next component: Gearbox** Press **Enter** on the center of the Dial, rotate the Dial, then select Gearbox. **Gearbox bearing type: Roller/ Journal** Select roller or journal bearings. **Number of speed changes: 1/2 /3** Scroll and select the number of changes. **What is known: Shaft speeds/ Gear ratios/Gear Teeth Count** Make selection and enter either shaft speeds, gear ratio, or gear teeth count. **Flexible coupling between gearbox and next component? Yes/No** Select whether there is or isn't a coupling between the gearbox and the coupling. **Next component that gearbox is attached to:** Press **Enter** on the center of the Dial, rotate the Dial, then select the driven unit. ***If the next component is a belt drive, skip to #14.***	**Gear driven machine** • Bearings on motor, gearbox and driven shafts • Motor shaft, gear shafts, driven shaft – different speeds ***If in doubt, use input and output shaft speeds to calculate ratio.*** ***Always use number one in ratio – 4.25:1 (reducer) or 1:4.25 (increaser).***

12.	**After completing the steps in #9:** **Next component:** Press **Enter** on the center of the Dial, rotate the Dial, then select **Driven unit – Pump, Fan, Compressor, Blower, or Spindle.** **Driven component (Fan) bearing type: Roller / Journal** Select roller or journal bearings. **Driven Unit (Fan) is supported by:** **Two Bearings/Overhung** "Two bearings" means the fan is supported on both sides (see diagram) "Overhung" the fan is mounted at the end of the shaft unsupported on one side. **No. of fan blades [optional]:** If you are certain you know the number of blades, enter the number. If not, leave blank. When you are done, select **Next Page**, and then select Done.	**Supported or Overhung Component** Supported Fan Overhung Fan ***If in doubt, select spindle for all driven units that are not a pump, fan, compressor, or blower.*** ***Blower refers to a driven with multi-stage centrifugal wheels or lobes, not a fan with blades (should be setup as a fan).*** ***Screw compressors – select roller bearings even if you have journals.***
13.	**After completing the steps in #10: Next component: Gearbox** Press **Enter** on the center of the Dial, rotate the Dial, then select Gearbox. Then follow steps in #11 for Gearbox.	**Belt and Gearbox driven machines**
14.	**After completing the steps in #11: Next component: Belt drive** Press **Enter** on the center of the Dial, rotate the Dial, then select **Belt drive**. Then follow steps in #10 for Belt drive.	

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