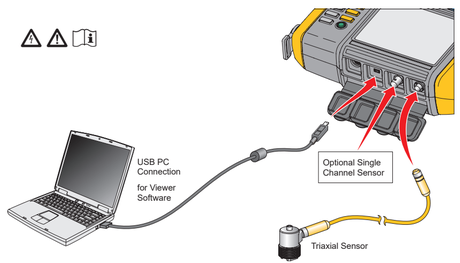
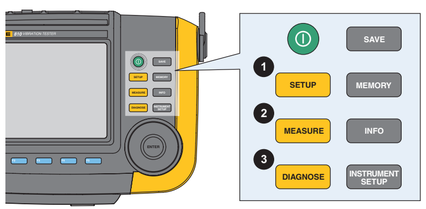
QRG

FLUKE®

Vibration Tester

810





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1 SETUP

Answer questions to describe your machine

Create a New Machine Setup	Explanations and Diagrams
1. Push **SETUP** or, on the startup screen select **New Machine**.	
2. Enter a machine name. Enter a descriptive name for the machine.	Use the Dial to select and enter characters. 15 characters maximum. For example: B5 Supply Fan 3

Machine Setup Questions

1. **Select motor type: AC DC**
2. **AC motor with VFD:**
   Yes - for a variable frequency drive
   No - for a constant speed drive
3. **Enter speed in RPM:**
   Enter the speed from the motor's nameplate.
4. **Enter nominal hp (kw):**
   Enter the horsepower or kilowatts listed on the motor's nameplate. Push **Next Page**.
5. **Motor mounted:**
   Horiz - the motor shaft is horizontal
   Vert - the motor shaft is vertical.
6. **Bearing type:**
   Roller - Roller bearings support a load with round rolling elements.
   Journal - Journal bearings support a load without round rolling elements.

   If in doubt, select Roller Bearings.
7. **Motor detached from drive train?**
   Yes - tests the standalone motor only. Make sure there are no components on the motor shaft.
   No - tests the motor and components.

   In most cases, select No and go to step 8. Selecting Yes does not remove vibration from components on the motor shaft.

Roller or Journal Bearings:

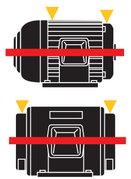


Roller bearing



Journal bearing

Detached motor:



8. **Motor Close Coupled?**
   (Also called *direct mount* or *direct drive*.)

   Yes - If both are true:
   - The motor shaft drives the driven components directly.
   - The only bearings are on the motor shaft. (for example, when the motor is bolted directly to a fan, a pump, or a compressor).

   No - All other cases.

   If in doubt, select No and go to step 9.

9. **Coupling between motor and next component?**
   Yes - there is flexible material between the flanges of the coupling. If the next component is a gear box, go to step 11. Otherwise, go to step 12.

   If in doubt, select Flexible Coupling.



Flexible Coupling

No - the coupling is rigid and the flanges are bolted together with no flexible material, or there is no coupling. If the next component is a belt drive, go to step 10. If the next component is a gear box, go to step 11. Otherwise, go to step 12.



Rigid Coupling

A Motor is "Close Coupled" if:

- There are no bearings on driven unit
- There is only one shaft running at one speed



Flexible or Rigid Coupling

Regardless of coupling type:

- There are bearings on both motor and driven shafts, and both are running at the same speed



10. **Next component:**
    Push **Enter** on the center of the Dial, rotate the wheel, and select **Belt Drive**. Make these selections:
    a. **Input shaft speed:**
       Enter the motor shaft speed. (Typically, the same as step 3.)
    b. **Output shaft speed:**
       Enter the driven unit shaft speed.
    c. **Rotation speed (optional):**
       Use a strobe to measure the speed of the belt.
    d. **Next component that belt is attached to:**
       If the next component is a gear box, go to step 11. Otherwise go to step 12.

11. **Next component:**
    Push **Enter** on the center of the Dial, rotate the wheel, and select **Gear Box**. Make these selections:
    a. **Bearing type: Roller / Journal**
       Select roller or journal bearings.
       If in doubt, select Roller.
    b. **Number of speed changes: 1 / 2 / 3**
       Scroll and select number of changes.
       If in doubt, select 1.
    c. **What is known: Shaft speeds / Gear ratios / Gear Teeth Count**
       Make selection and enter either shaft speeds, gear ratio, or gear teeth count.
       If in doubt, select Gear ratios and use the input and output shaft speeds to calculate the ratio.
    d. **Flexible coupling between gearbox and next component? Yes / No**
    e. **Next component that gear box is attached to:**
       If the next component is a belt drive (only available if d. is **No**), go to step 10. Otherwise go to step 12.

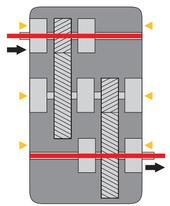
Belt driven machine

- Bearings on motor and driven shafts
- Two shafts with different speeds



Gear driven machine

- Bearings are on the motor, gearbox and driven shafts
- Motor shaft, gear shafts, driven shaft are different speeds

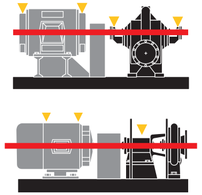


Always use number one in ratio - 4.25:1 (reducer) or 1:4.25 (increaser).

12. **Next component:**
    Push **Enter** on the center of the Dial, rotate the wheel, and select **Driven unit - Pump, Fan, Compressor, Blower, or Spindle**.
    a. **Driven component (Pump) bearing type: Roller / Journal**
       Select roller or journal bearings.
    b. **Driven Unit (Pump) is supported by: Two Bearings** - the pump is supported on both sides (see diagram, top-right).
       Overhung - the pump is mounted at the end of the shaft unsupported on one side (see diagram, bottom-right).
    c. **No. pump vanes [optional]:**
       If you are certain you know the number of vanes, enter the number.
       If not, leave blank.
    d. When you are done, select **Next Page**, and then select **Done**.

       If in doubt, select Spindle for all driven units that are not a pump, fan, compressor, or blower.

Supported or Overhung Component

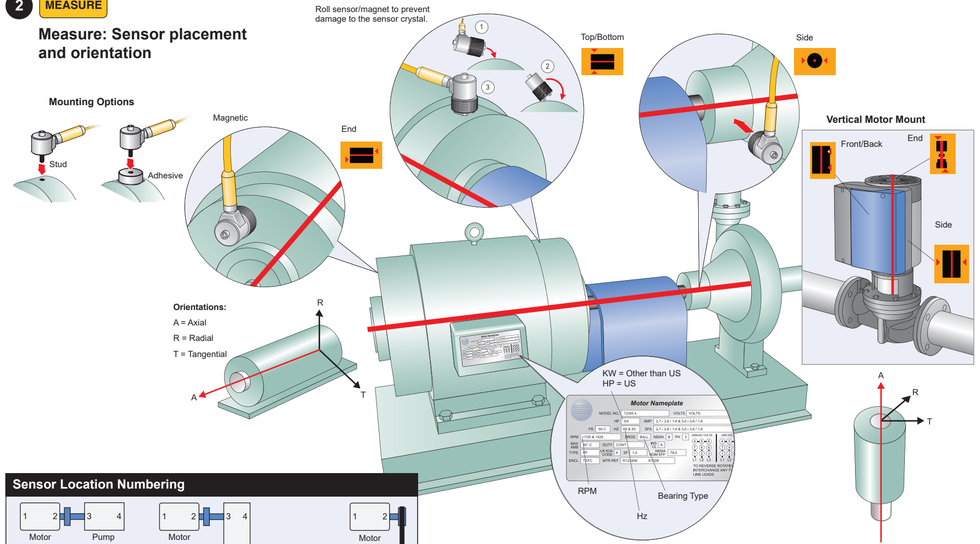


Blower - a Hoffman type (multi-stage centrifugal wheels) or Roots type (lobes). For a blower that is a fan with blades, select **Fan**.

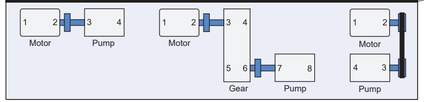
Screw compressors – select Roller bearings even if you have Journal bearings.

2 MEASURE

Measure: Sensor placement and orientation



Sensor Location Numbering



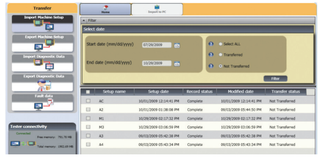
The speed of the motor is critical for good diagnosis.

- Constant speed – enter RPM from nameplate.
- Variable speed – enter RPM from tachometer, local meter, or calculate from VFD panel.

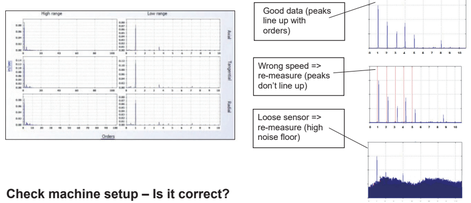
3 DIAGNOSE

Diagnose: Review, report, and make recommendations

Transfer data and results to the Viewer software on your PC for review



Check data validity using Viewer software



Good data (peaks line up with orders)

Wrong speed => re-measure (peaks don't line up)

Loose sensor => re-measure (high noise floor)

Check machine setup – Is it correct?

Machine Setup Name : K196

Setup Field	Input
Motor type	AC
AC motor with VFD	No
Speed in RPM	3570
Normal hp	250
Motor mounted	Horizontal
Motor has	Roller Bearing
Motor detatched from drive train	No
Motor close-coupled	No
Setup Field	Yes
Coupling between motor and next component	Compressor
Driven component bearing type	Roller bearing
Compressor type	Screw compressor

Good setup = good results

Bad setup = bad results

- Wrong speed
- Wrong machine type
- Missing information
- Number of vanes, blades, etc.

Diagnostic Report – How to read the machine condition report and when action is needed.

A Find how bad is the problem?

Slight	No repair action is recommended. Retest the machine and monitor the condition after maintenance.
Moderate	(Months, even up to a year) No immediate repair actions required. Increase the frequency of measurements and monitor the condition of the machine.
Serious	(Weeks) Take maintenance action during the next planned downtime or maintenance period.
Extreme	(Days) Immediate action is required. Consider shutting down the equipment and taking repair action now to avoid failure.

Severity Score	Recommendation	Priority	Description Priority
0-25	No action	1	No recommendation
26-50	Monitor for vibration Do not repair yet	2	Desirable
51-75	Schedule repair	3	Important
76-100	Repair immediately Avoid catastrophic failure & production loss	4	Mandatory

B Find where is the problem?

Motors (AC/DC)

Fans and blowers

Belts and chain drives

Gearboxes and couplings

Pumps (Centrifugal, Piston, Sliding Vane, Propeller, Screw, Rotory Thread/Gear/Lobe)

Compressors (Piston, Centrifugal, Screw)

Closed coupled machines

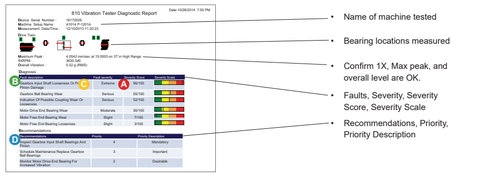
Spindles

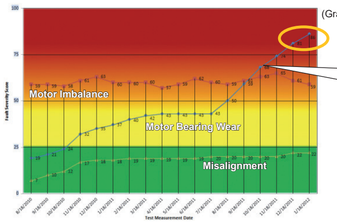
C Find what is the problem?

Bearing wear	Inbalance
Misalignment	Looseness

D Select repair details for prioritized recommendations







Act on recommendation, not fault

Track fault severity over time

- No action for Slight/Moderate
- Review report on Serious/Extreme
- Act after data validity confirmed

Fault: Motor Bearing Wear, Extreme, 86/100

Recommendation: Mandatory, Replace Motor Bearings

Action: Generate work order, Replace Motor Bearings