

APPLICATION GUIDE

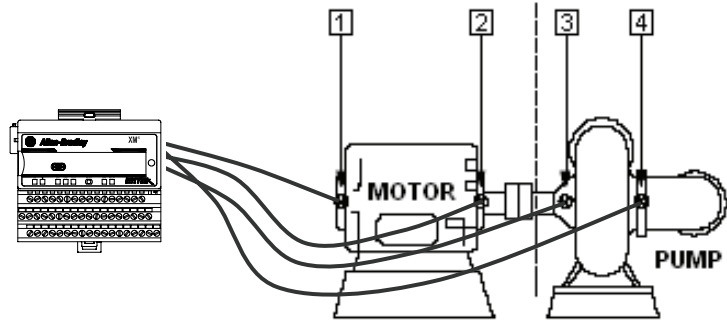
CONDITION MONITORING

CENTRIFUGAL PUMP & MOTOR

XM-160 MACHINE VIBRATION MONITOR OVERVIEW



The XM Overall Vibration Modules are a series of intelligent 6-channel monitors designed to cost effectively serve applications for real time monitoring of overall (direct) vibration. Designed as a simple but complete monitoring system in a compact easily installed and easily maintained package, each module measures and reports the overall vibration level between selected high and low pass filters, as well as the bias (gap) voltage per channel.



Accelerometers: 1 per bearing location; 1 & 2 installed in the horizontal direction, 3 & 4 installed in line with the discharge

This document provides a general guidance in how to apply an XM Series condition monitoring system to the specified class of equipment. The objective is to implement a monitoring solution that will identify the majority of faults common to this class of machinery at the earliest indication of the fault and to do this for the lowest possible total cost. Contact your local Rockwell Automation service group to customize a system more specific to your application.

INDUSTRIES

- Automotive
- Discrete Manufacturing
- Food Processing
- Metals
- Mining
- Marine
- Oil & Gas
- Paper
- Power
- Water/ Waste Water

YOU WILL NEED: *		
Catalog #	Description	QTY
1440-VDRS06-00RH	XM-160 Overall Vibration Module	1
1440-TB-H	Terminal Base for XM-160 / XM-161 / XM-162	1
EK-437841	Model 9100 General Purpose Accelerometer	4
EK-468011	32' Accelerometer Cable (splash proof)	4
1440-SCDB9-FXM2	XM Serial Communications Cable	1

* Additional requirements may include power supply, enclosure, power or DeviceNet cables, junction boxes, sensor adhesives / mounting tools, etc.

LISTEN.
THINK.
SOLVE.™

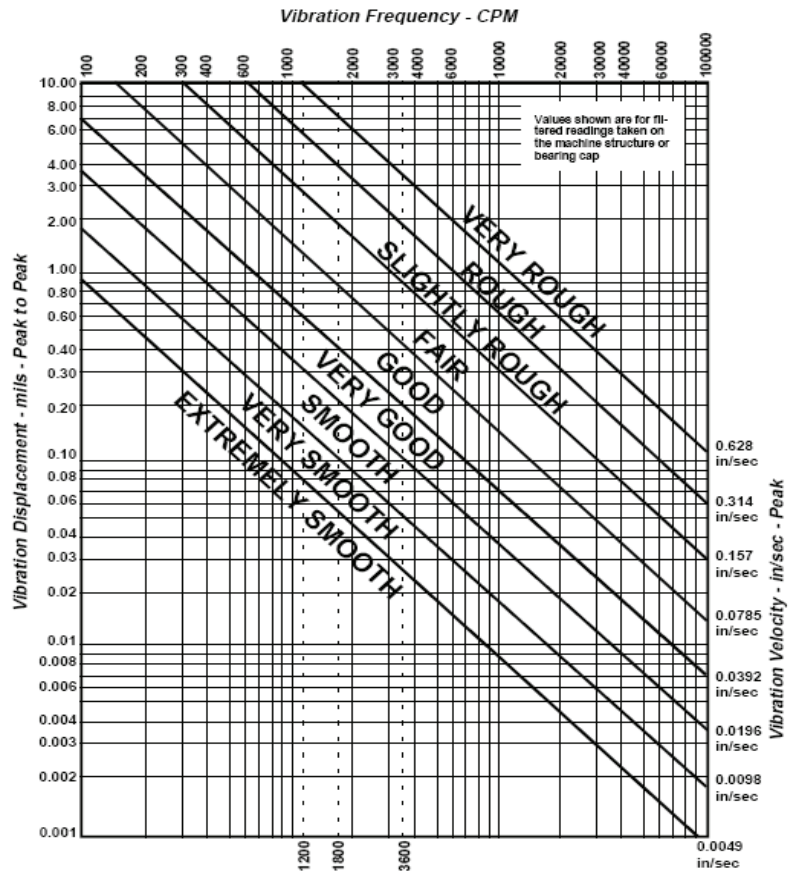
Vibration Displacement & Velocity Severity Chart

The vibration severity chart is one example of a general guide to machinery condition. On this chart, the horizontal axis is scaled in terms of vibration frequency and the vertical axis in terms of displacement. The areas between the diagonal lines represent levels of vibration severity, from EXTREMELY SMOOTH to VERY ROUGH.

For instance, if you measure displacement amplitude of 0.30 mils peak-to-peak at a frequency of 3600 CPM, by cross-referencing these two values on the chart, you will find that the machine is operating in the GOOD range. The chart clearly shows that the severity of a machine's vibration depends on both the amount of displacement and the frequency of vibration. As the frequency of the vibration increases, the amount of displacement decreases for a given machine condition.

The same chart is simple to use with vibration velocity. Notice that each of the lines dividing the areas of severity is labeled with a figure for vibration severity. The SLIGHTLY ROUGH areas, for example, begin at 0.157 in/sec and end at 0.314 in/sec. Therefore, if you measure a velocity of 0.20 in/sec, regardless of the frequency, the chart indicates the machine is running SLIGHTLY ROUGH.

The guidelines offered in this chart apply to general rotating machinery where vibration does not directly influence the quality of a finished product - motors, fans, blowers, and pumps. Such charts are not meaningful for machines that have inherently high vibration levels such as hammer mills, rock and coal crusher, etc. The guide is useful only where experience, maintenance records, history of the technology and common sense show it to be valid.



Important: When determining frequencies that should be monitored and alarm levels, the recommendations provided should only be used as general guidelines. Measurement parameters and alarm levels should be determined by the equipment OEM, industry standards such as ISO, and the actual operating characteristics of your equipment.

STANDARD CHANNEL SETTINGS	
Parameter	Setting
Input Unit	g's
Output Unit	ips [mm/s]
Fault High	16
Fault Low	4
Signal Detection	Calc. Peak [RMS]
Full Scale	2 [0.5]
High Pass Filter	
> 600 RPM	3 Hz
> 1200 RPM	10 Hz
Low Pass Filter	
> 600 RPM	1000 Hz
> 1200 RPM	5000 Hz
Sensitivity	100 mV/g

Square brackets ([]) indicate the International System of Units

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