power motor (hard base). Class Ⅳ is high power motor (stretch base)

⑵. A,B,C,D are vibration Rank. 'A' means good, 'B' means satisfying, 'C' means not satisfying, 'D' means forbidden. Vibration velocity should be taken from the three perpendicular axes on the motor shell.

B. ISO/IS2373 Motor quality standard according as vibration velocity

Quanlity rank	Rev (rpm)	H: high of shaft(mm) Maximum vibration velocity (rms) (mm/s)		
		80<H<132	132<H<225	225<H<400
Normal (N)	600~3600	1.8	2.8	4.5
Good (R)	600~1800	0.71	1.12	1.8
	1800~3600	1.12	1.8	2.8
Excellent (S)	600~1800	0.45	0.71	1.12
	1800~3600	0.71	1.12	1.8

Limit of rank 'N' is suitable for common motor. When the request is higher than that in the table, limit can be gotten by dividing the limit of rank 'S' with 1.6 or multiples of 1.6.

Displacement is typically used on low-speed machines because of its good low frequency response, and is relatively ineffective when monitoring bearings. Units are typically mils or mm equivalent peak-peak.

5.2 **An Introduction To Vibration Measurement**

Vibration is a reliable indicator of the mechanical health or condition of a particular machine or product. An ideal machine will have very little or no vibration indicating that the motor, as well as peripheral devices such as gearboxes, fans, compressors, etc., are suitably balanced, aligned, and well installed.

In practice, a very high percentage of installations are far from ideal, the results of misalignment and imbalance exerting added strain on supporting components such as bearings. Eventually this lead to added stress and wear on critical components, resulting in inefficiency, heat generation and breakdowns. This often occurs at the most inconvenient or uneconomical times, causing costly production downtime. As parts of mechanical equipment wear and deteriorate, the equipment vibration increases. Vibration measurement is therefore a powerful aid in the predictive maintenance of such equipment, reducing downtime and assisting in the smoother running of the plant or factory.

5.3 **What is a Trend?**

A trend is an indication of the way in which a monitored vibration parameter behaves over time.

DIGITAL VIBRATION METER

This Vibration Meter is small in size, light in weight, easy to carry. Although complex and advanced, it is convenient to use and operate. Its ruggedness will allow many years of use if proper operating techniques are followed. Please read the following instructions carefully and always keep this manual within easy reach.

Operating conditions:

Temperature : 0-50 ℃

Humidity : below 90% RH

Power supply:4x1.5 v AA size batteries

Dimensions: 160x68x32mm/6.3x2.7x1.2 inch

Weight: 181g (not including batteries)

Accessories included :

Powerful rare earth magnet . . . . 1 pc.

Accelerometer . . . . . 1 pc.

Stinger probe (Cone) . . . . . 1 pc.

Stinger probe (Ball) . . . . . 1 pc.

Carrying case. . . . . 1 pc.

Operation manual . . . . . 1 pc.

1. FEATURES

* In accordance with ISO 2372, used for periodic measurements, to detect out-of-balance, misalignment and other mechanical faults in rotating machines.
* Specially designed for easy on site vibration measurement of all rotating machinery for quality control, commissioning, and predictive maintenance purposes.
* Individual high quality accelerometer for accurate and repeatable measurements.
* LCD digital display
* Lightweight and easy to use
* Automatic power shut off to conserve power.

2. SPECIFICATIONS

Display: 4 digits, 18 mm LCD
Transducer : Piezoelectric accelerometer
Parameters measured:
only Velocity
Measuring range :
Velocity : 0.01-19.99 cm/s true RMS
Frequency range for measuring
Velocity : 10Hz. to 1kHz
Accuracy: 5%+2 digits
Power off : 2 modes
Manual off any time
Auto power off after 5 minutes from last operation

3. FRONT PANEL DESCRIPTIONS

3-1 Accelerometer
3-2 Display
3-3 Input Connector
3-4 Hold key
3-5 Power Key
3-6 Battery cover/compartment

4. MEASURING PROCEDURE

4.1 Connect the Accelerometer to the input connector and turn it until the connector locks in position.
4.2 Mount the accelerometer at the measurement point using the powerful magnet supplied, ensuring that the mounting surface is clean and flat, or use direct stud mounting if this is available.
4.3 Depress the power key and release to power on the meter.
4.4 Read the value from the display.
4.5 To hold the max. value during measurements,

Measurements are taken and plotted over a period of time, the resulting graph shows the progress or deterioration of a particular machine.
Such a trend enables the maintenance engineer to predict the time of failure and maximize use of the machine, while ordering spares and planning its maintenance for a time convenient to the production schedule.

6. BATTERY REPLACEMENT

6.1 When the battery symbol appears on the display, it is time to replace the batteries.
6.2 Slide the Battery Cover away from the instrument and remove the batteries.
6.3 Install batteries paying careful attention to polarity.

7. Appendix: Vibration standards

A. Rank of machine vibration (ISO 2372)

Vib ratio amplitude	Machine sort			
Vib ratio n velocity V rms (mm/s)	I	II	III	IV
0~0.28	A	A	A	A
0.28~0.45				
0.45~0.71				
0.71~1.12	B	B	B	B
1.12~1.8				
1.8~2.8	C	C	C	C
2.8~4.5	D	D	D	D
4.5~7.1				
7.1~11.2				
11.2~18				
18~28				
28~45				
>45				

Note:
(1) Class I is small motor (power less than 15 kw). Class II is medium motor (power between 15 ~75kw). Class III is high

Just depress the HOLD key till the symbol `max` appears on the display. To display instant values, just depress the HOLD key again till the symbol `max` disappears on the display.

5. CONSIDERATIONS

5.1 **Which Parameters Should be Measured?**
Acceleration, velocity, and displacement are the three tried and tested parameters, which give accurate and repeatable results. Other measurement parameters have yet to prove themselves to be as reliable, accurate, and repeatable.
Acceleration is normally measured in m/s peak (meters per second squared) has excellent high frequency measurement capabilities, and is therefore very effective for determining faults in bearings or gearboxes.
Velocity is the most commonly used vibration parameter. It is used for vibration severity measurements in accordance with ISO 2372, BS 4675 or VDI 2056, which are guidelines for acceptable vibration levels of machinery in different power categories. These are presented as a table in section 4 of this manual. Velocity is typically measured in cm/s RMS (centimeters or millimeters per second).
Note: This instrument measures in cm/s. If you are more familiar with measurements in mm/s, or wish to compare your measured values directly with the vibration severity chart in section 4, multiply the displayed value by 10.