

Vibration Tester TV110

Instruction Manual



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1. General Descriptions

1.1 Range of applications

The vibration testing meter is designed to test conventional vibrations, especially the vibration test in rotating and reciprocating machines. It can be used not only to test the acceleration, velocity and displacement of vibration, but also to perform simple failure diagnosis and print out values. The technical specifications of the meter comply with the requirements of this vibration scale of the testing meter specified by ISO 2954 international standards. The meter is widely used in machinery, power, metallurgy, automobile and other industrial sectors.

1.2 Basic working principle

The meter employs piezoelectric acceleration transducer to convert vibration signals into electric signals. Then by analyzing and processing input signals, values of acceleration peak, virtual value of velocity and peak-peak of displacement are displayed and printed out as well as the spectrum charts.

1.3 Basic configuration and meter component description

1.3.1 Basic configuration

TV110 main unit	1 piece
Micro printer	1 piece
Vibration testing transducer	1 piece
Battery charger	1 piece
Magnetic base	1 piece (optional)

1.3.2 Description of meter components

A. Main unit and micro printer (see Figure 1)

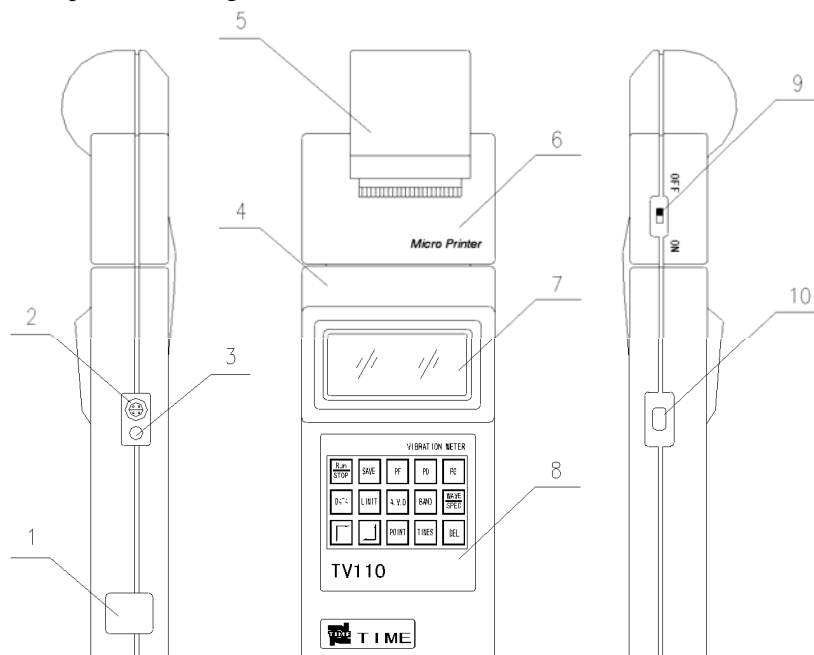


Figure 1. part description of main unit and printer

- | | | |
|--------------------|-----------------------|-------------------|
| 1. stop plate | 2. transducer socket | 3. charger socket |
| 4. TV110 main unit | 5. printer paper tray | 6. micro printer |
| 7. screen | 8. keyboard | 9. printer switch |
| | | 10. power switch |

B. Transducer (see Figure 2)

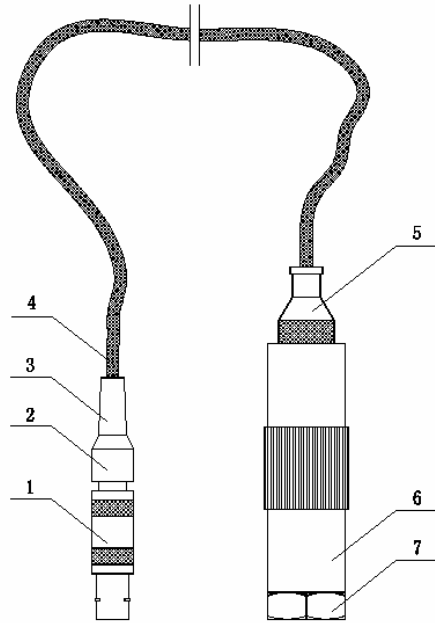


Figure 2. description of probe components

- | | | |
|------------------------|------------------|-------------------|
| 1. position sleeve | 2. fixing tie-in | 3. protection cap |
| 4. communication cable | 5. cable port | 6. shell |
| | | 7. base |

C. LCD screen (see Figure 3)

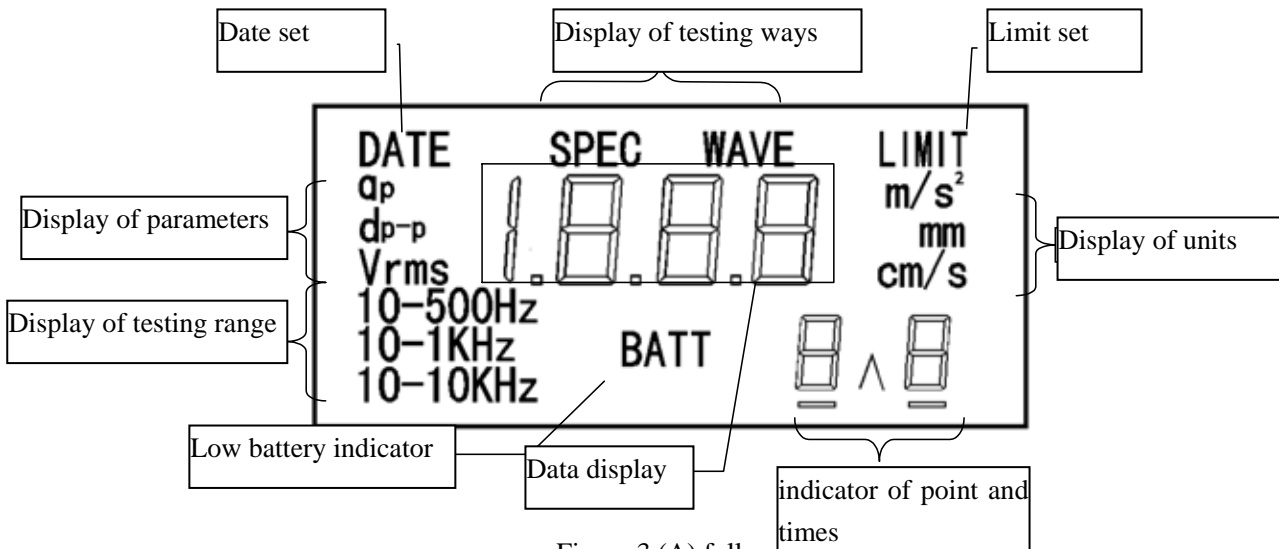


Figure 3 (A) full screen display

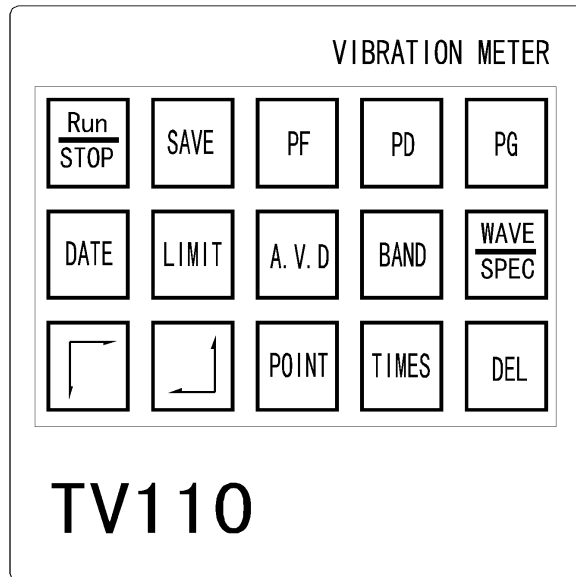


Figure 3.(B) partition areas of display functions

- | | | | |
|---------------------------|-------------------|--|-----------------------|
| 1. date indication | 2. operation mode | 3. limit definition | 4. testing parameters |
| 5. data area | 6. testing unit | 7. range of frequency | |
| 8. low voltage indication | | 9. decimal point and number indication | |

2. Technical Specifications

2.1 Performance parameters

1. Testing range

Acceleration:	0.1 – 199.9 m/s ²	(peak value)
Velocity:	0.01 – 19.99 mm	(effective value)
Displacement:	0.001 – 1.99 mm	(peak – peak value)
2. Frequency range

Acceleration:	10 – 500 Hz, 10Hz – 1KHz, 10Hz – 10KHz
Velocity:	10 – 500 Hz, 10Hz – 1KHz
Displacement:	10 – 500 Hz
3. Tolerance: equal or smaller than $\pm 5\%$ ± 2 digits
4. Operating temperature: 0 – 45 deg. C
5. Power supply: nickel — hydrogen battery 4×1.25V
6. Dimensions: 270×86×47 (mm)
7. Weight: 650g

2.2 Main functions

1. Equipped with printer and measurement value and acceleration spectrum charts can be printed.
2. low voltage indication

3. The limit definition: automatic alarm when the measurement value is beyond the limit (the screen will display “1” in flicking manner)
4. Deletion function: The measurement values and spectrum charts stored can be deleted.
5. Memory function: It can store 100 measurement values and 10 spectrum charts.

3. How to Use the Meter

3.1 Testing method

3.1.1 The transducers should be laid on the object to be tested tightly.

There are three ways to install the meter:

- 1) Put the transducer on the object to be tested by hand.
- 2) Tie the transducer onto the object to be tested.
- 3) Install the transducer on the object to be tested with magnetic base.

3.1.2 The transducer should be installed perpendicularly to the surface of the object to be tested.

3.2 How to operate the meter

3.2.1 Start

First put the transducer plug into the transducer socket on the main unit and then switch on the power switch. The information as shown on Figure 4 will be displayed two seconds after the full LCD screen is displayed. If the testing parameter you desire conforms to the current state, the testing operation can be performed.

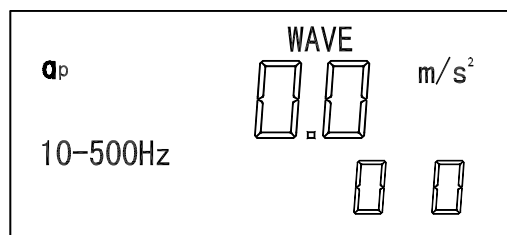


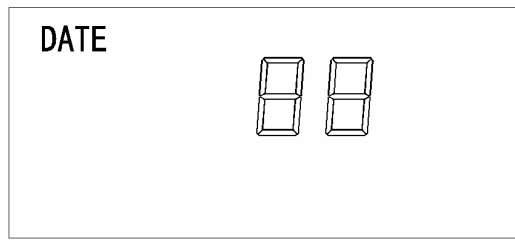
Figure 4

3.2.2 Testing

When performing the test, push and hold RUN/STOP key. The testing value will be displayed on the screen. At this time, keyboard is disabled and no key will function. Release the keys, the last testing value will be displayed.

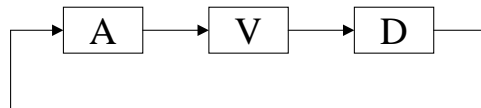
3.2.3 Set the data of test

- A. Push DATE key to set the year as shown on Figure 5. Use key (subtract 1) or key (add 1) to make the adjustment. Push the key down and hold, adjustment will be continuously made.
- B. Push again the DATE key to set month and the method is as the above.
- C. Push again the DATE key to set date and the method is as the above.
- D. Push again the DATE key to exit the set mode.



3.2.4 Set the testing parameters

Normally the system is at the state of A. Press AVD keys the screen will display A (Acceleration), D (Displacement) and V (Velocity) in turn.



3.2.5 Set testing mode and spectrum mode

Normally the system is at WAVE (testing) mode. Press WAVE/SPEC key will switch to SPEC (Spectrum) mode. Press again the same key, the system will return to WAVE mode. At the WAVE mode, the tested value can be either displayed or printed out.

At the SPEC mode, the tested value on the screen will flicker to indicate that the system is processing the data. One minute later, the tested value flickering on the screen will become stable to indicate the data processing is over. Then the spectrum charts can be either stored or printed out.

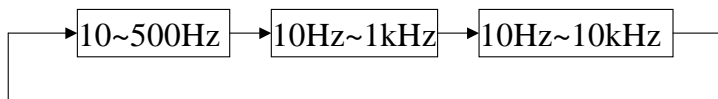
10 – 500 Hz step: When spectrum analysis reaches 400 Hz, there will be 400 spectral lines and the resolution is 1 Hz.

10 Hz – 1KHz step: When spectrum analysis reaches 800 Hz, there will be 400 spectral lines and the resolution is 2 Hz.

10Hz – 10KHz step: when spectrum analysis reaches 3.2 KHz, there will be 400 spectral lines and the resolution is 8 Hz.

3.2.6 Set the band width

Normally the system is at 10 – 500 Hz and press BAND key, the band width can be changed in turn.



3.2.7 Set the limit

A. Press LIMIT key, the screen will display: A: 199.9 m/s² or D: 1.99 mm or V: 19.99 cm/s.

Use key (subtract 1) or key (add 1) to make adjustments. Press down and hold, the adjustment will be continuous.

B. Press down LIMIT key again to exit the set mode. When testing if the testing value is beyond the limit, the screen will display “1” to indicate that the limit is exceeded.

3.2.8 Feeding the paper

Switch on the printer and press PF key to feed the paper one line forward without printing.

3.2.9 Print out the test data

Turn the printer switch on and press PD key to print ten stored test data corresponding to POINT.

3.2.10 Print out spectral charts

Turn the printer switch on and press PG key to print out the spectral charts.

Note: in this meter one point symbol stores one chart and altogether ten charts can be stored. When the line under the POINT is lighted, the spectral chart corresponding to that point is printed out.

- If the printer is not to be used, it can be removed according what is shown on Figure 6. When the horizontal line under the POINT is not lit, the spectral chart for the current testing point will be printed out. If no testing is performed, the printer will not operate. When removing the printer, be sure that the force must be even and the direction must be correct so as to avoid the damage of the housing. For the convenience of operation, after the printing device is removed, plate and bracket can re-installed. In order to ensure reliable operation of the connecting port of the printer, the plug should be fitted.



Figure 6.

- When changing the ribbon, first remove the printer and then open the cover of the printer as shown in Figure 7. After changing the ribbon, the turning knob will be turned in the direction as shown by the arrow so as to tighten the ribbon.



Figure 7.

3.2.11 Set the point

A. At the WAVE mode, press POINT key then use key (subtract 1) or key (add 1) to make the adjustments. At the same time the stored value corresponding to POINT, TIMES will be displayed.

B. At the SPEC mode, press POINT key. When the horizontal line under the POINT is lit, the spectral charts corresponding to the point will be printed out. When the horizontal line is not lit, the spectral chart of the current testing point will be displayed.

3.2.12 Set times

Press TIMES key then use key (subtract 1) or key (add 1) to make the adjustments.

3.2.13 Store

Press WAVE key and if it is at WAVE mode, the currently displayed data can be stored in the memory unit corresponding to testing point number and testing times displayed on the screen. If the prompt symbol is lit, the preciously stored data must be deleted first before the save operation can be performed. One point number can store ten testing data and this meter can store 100 testing values. If it is at SPEC mode, the spectral charts corresponding to the testing points can be stored in the corresponding memory areas. If spectral charts have been stored in the corresponding memory unit, the prompt symbol will be lit. Then the previously stored spectral charts have to be deleted before the save operation can be performed. One point symbol can store only one chart and up to ten charts can be stored.

3.2.14 Deletion

Press DEL key and at the WAVE mode, what is stored in the memory unit corresponding to the testing point number and testing times displayed on the screen can be deleted. At the SPEC mode, spectral charts corresponding to the testing point number can be deleted. After the testing is done, turn off the power switch on the main unit and the printer switch.

3.3 Trouble shooting

3.3.1 When BATT is flashing on the screen, this means that the voltage of the battery is lower than the rated working voltage. When BATT is lit on the screen, it shows that the meter cannot work normally. Then the power should be turned off and battery should be charged.

3.3.2 When the printer does not work normally, the tester should be turned off immediately and then wait for about half a minute before the printer can be turned on again.

4. Maintenance

Strictly avoid collision, heavy dust, dampness, strong magnetic field, oil, grease and dirt.

- Charge the main unit regularly: Charge the battery again after every 8 – 24 hours operation. The charging time for each charge is 8 hours.
- Replace the printing paper: As shown in Figure 8, push the printing paper cover towards the front and remove the cover. After installing printing paper roll, insert the end of the paper roll into the paper in take. Press PF key until the end of the paper roll goes through the printing head and exposed out of the housing. Finally put the printing paper cover on.



Figure 8

5. Non-warranty Parts

Probe, Sheath of TV110, Battery, Charger, Magnetic Stand, cover of printing chamber