



P/N:110401102672

UNI-T®



UT313/UT315

Operating Manual



Vibration Testers

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I、 Overview

Designed with artificial polarization piezoelectric effect, UT313/UT315 portable vibration meter apply to the normal vibration measurement of mechanical equipment, especially vibration measurement of the rotating and reciprocating machinery, widely used in industrial measurement such as Machine Manufacturing, electric power and metallurgy etc.

II、 Configuration

- ★ home computer-----One piece
- ★ handle accessory machine-----One piece
- ★ 9V battery-----One piece
- ★ English manual-----One
- ★ warranty card-----One piece

- ★ long probe-----One piece
- ★ short probe-----One piece
- ★ magnetic chuck-----One piece

III、 Property

- ★ LCD provides intuitive display of measurement value and measurement status
- ★ Measurable acceleration, velocity, shift
- ★ Can select different vibration frequency property
- ★ Adopt high-sensitive probe with accurate measurement
- ★ Equip with a long and short probe, applicable to measurement in different occasion

- ★ Equip with a magnetic chuck, used to test when it is not convenient to hold.
- ★ Low electricity indication function
- ★ Automatic power-off function
- ★ LCD backlight function
- ★ Maximum value display function
- ★ USB communication function (only for UT315)
- ★ Data hold function
- ★ Data storage function

IV、 Instructions about product major components

POWER key: press the key until power on, and keep pressing, LCD will hold full display 1 second. Stop pressing, it starts working, press key **POWER** again to power off.

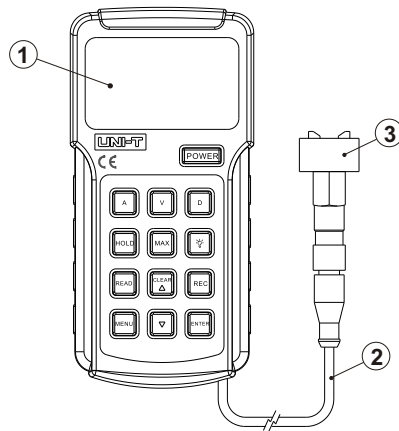
Key **A**: Acceleration measurement


Key **V**: Velocity measurement

Key **D**: displacement measurement

HOLD key : HOLD data; press it again to cancel holding data.

MAX key : MAX display the maximum value



 Key: open or close backlight

READ key: check record data

CLEAR/▲ key: Delete record data; data upturning, USB communication, automatic power-off and storage time setting

REC key: data storage

MENU key: menu function set

▼ key: Data down turning, USB communication, automatic power-off and storage time setting


ENTER key: confirm

- ① LCD (liquid crystal display)
- ② Sensor connecting wire
- ③ Probe (long & short probe and magnetic suction pad for option)

V、LCD Display


1. Battery symbol: indicates present remaining electricity. Four grades:

 3 bars: sufficient electricity

 2 bars: rather sufficient

 1 bar: electricity will be

depleting, please replace battery

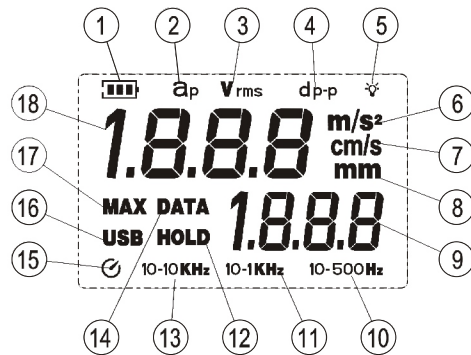
 Empty: electricity has depleted, you have to replace battery. The battery symbol shall flicker.

2. aP: acceleration indicator

3. V_{rms}: velocity indicator

4. dp-p: displacement indicator

5.  : Backlight indicator



6. M/s²: acceleration unit indicator

In velocity measurement, LCD display the velocity unit “ m/s”

7. cm/s: velocity unit indicator

8. mm: displacement unit indicator

9. Data record number display area

10. 10-500Hz: 10Hz-500Hz indicator

11. 10-1kHz:10Hz-1kHz indicator.

12. HOLD: reading hold measurement

13. 10-10kHz: 10Hz-10kHz indicator

14. DATA: data storage indicator

15.  : Automatic power-off function indicator

16. USB: USB indicator

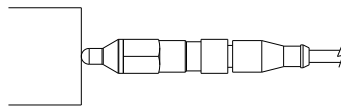
17. MAX: maximum value measurement indicator

18. Measurement data value display area

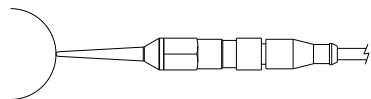
VI、 Select test method

Please select test method based on real status, four statuses:

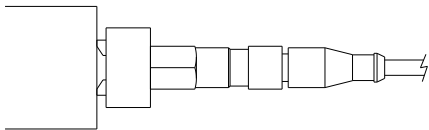
- 1) Use short(s) probe to measure: it is installed with the machine and applicable to wide scope vibration measurement; it can acquire effective response numerical value, as shown in the following illustration



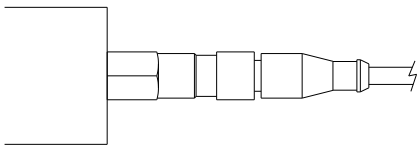
- 2) Use long (L) probe to measurement: it is an accessory in a package, mainly used in rather narrow or special object area, with quick response, as shown in the following illustration



- 3) Use magnetic chuck to measure: it is an accessory in a package, mainly used in plain area of iron objects, for instance, elevator etc. as shown in the following illustration



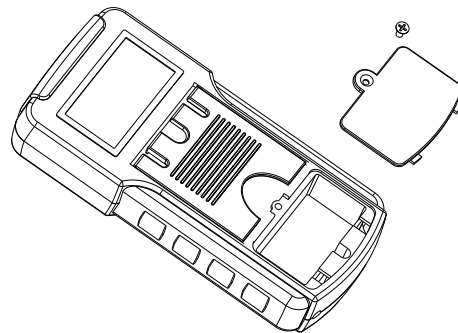
- 4) Remove hardware probe to measure: used in plain object surface measurement to acquire stable data, as shown in the following illustration.



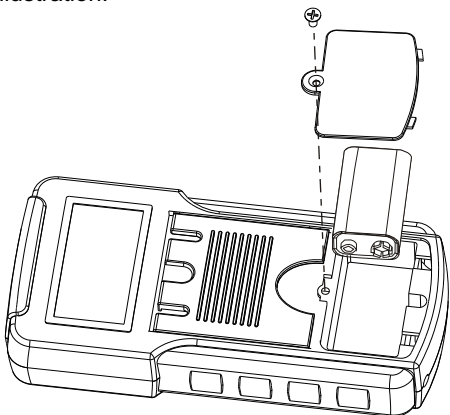
VII、 Battery installation and check

Install battery:

Hold apparatus, press battery door with right thumb, open battery door from the arrow-pointed direction, as shown in the following illustration.

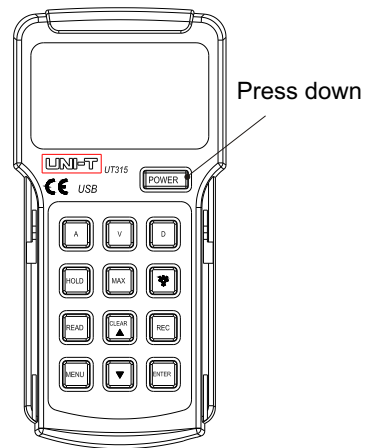




- 2) Put 9V (G6F22 6F22) battery into battery holder correctly, aware of battery polarity and then close battery holder door, as shown in the following illustration.

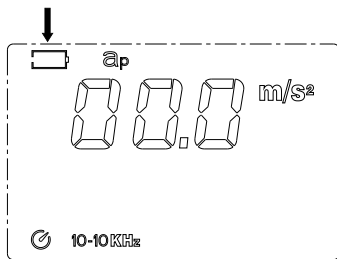


VIII、 Power on and check battery status;

- 1) Press “POWER” key to power on.
As shown in the following illustration:



- 2) Press the key until LCD hold full display 1 second, stop pressing it to start working with fault status being acceleration measurement mode, USB failure to communicate and automatic power-off status; if LCD screen displays symbol “” or “”, please replace battery timely as shown in the following illustration.

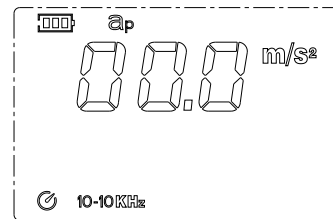


Press POWER key to power off immediately.

IX、Function operation instruction

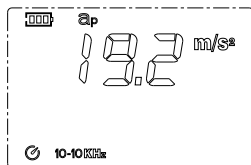
1、Acceleration measurement:

- 1) Press key “A” to enter into acceleration measurement mode with fault status being acceleration measurement mode “m/s²”, LCD screen shall display aP; indicators of 10-10kHz and m/s² are as follows:



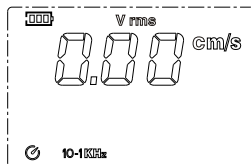
- 2) Use probe to measure object according to the selected way and measurement result shall display in data value display area of LCD,

as shown in the following illustration:

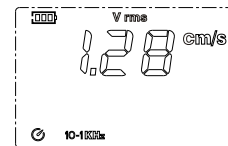


2、Velocity measurement:

- 1) Press key “V” to enter into velocity measurement mode and LCD screen shall display V_{rms} ; indicators of 10-1kHz and cm/s are as follows:

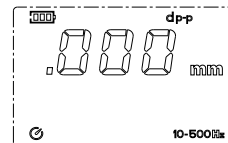


- 2) Use probe to measure object according to the selected way and measurement result shall display in data value display area of LCD, as shown in the following illustration:

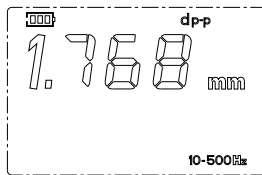


3、Displacement measurement:

- 1) Press key “D” to enter into velocity measurement mode and LCD screen shall display dp-p; indicators of 10-500Hz and mm are as follows:



- 2) Use probe to measure object according to the selected way and measurement result shall display in data value display area of LCD, as shown in the following illustration:






4、Maximum value measurement

Under corresponding measurement mode, press key “MAX” to enter into maximum value measurement mode, LCD screen shall display indicator of MAX and results of maximum under corresponding measurement mode in the data value display area; press key MAX to cancel maximum value measurement.

5、Reading holds measurement:

Press HOLD key to enter into reading hold measurement mode, LCD screen shall display indicator of HOLD and hold the present measurement value in data value display area on LCD screen.

6、Backlight display:

Press the key “” to enter into LCD backlight display mode, and LCD screen shall display indicator , and light up, press key “” to exit backlight display.


7、Data storage:

Press key REC to enter into manual data storage mode, LCD screen shall display indicator of DATA and store the present measurement value manually, DATA signal shall disappear after about 0.5 second; press key REC to conduct next position data storage. Press REC for a long time to enter into automatic data storage mode, indicator of DATA on LCD screen shall flicker continuously, and store the present measurement value automatically

between the set time intervals (detailed in menu function set). If automatic record count exceeds the maximum record count 1999, it shall exit data storage automatically.

8、 Check record data

Press key REND to enter into check record data mode, if no storage data, data value on LCD screen display area display “---” data record number display area display “---” and enter into test function after about 0.5 second. If any storage data, it shall display the last data and record number; press key “▼” to reduce record number and its corresponding storage data; Press for a long time to automatically reduce them. Press key “▲” to increase record number and corresponding storage data, press it for a long time to increase them automatically. Press REC to display increase by 100, if record count is less than 100 or exceed maximum record count 1999, it shall back to the first record number and corresponding storage value; press REC to back to the first record number and corresponding storage value. Under the mode,

only the above keys and  can be used except for others. Press the key to exit the mode.


9、 Delete record data:

Method1: before start machine, press key CLEAR and POWER in the same time, stop pressing key POWER until LCD screen display CLR, record deletion has been completed.

Method2: restore factory setting (detailed in menu function setting)

10、 Menu function set:

Press key MENU to enter into menu function set with fault status USB0, which indicates failure to conduct USB communication, press key ▲ or ▼ to change USB setting, LCD screen shall display indicator of USB and USB1 indicates being able to conduct USB communication; Under menu function set mode, press key READ, LCD display USB1 flickering, after memory data transmitted to computer, press key ENTER to save and enter into next menu ---set automatic power-off AP01, which indicates automatic power-off function


is open, LCD shall display indicator , and press key ▲ or ▼ to set AP00, indicating the automatic power-off function is off, then set AP01. Press ENTER to save and enter into next menu to record interval automatically, press automatic add for a long time or press key ▼ to reduce time, press automatic subtraction, time scope of the machine can be set is 0.5-255; Press key ENTER to save and enter into next menu-factory set. LCD displays DEF? (Press key ENTER to restore factory set USB0, AP01, 60S, clearing all record data. If press key MENU, it will enter into the original measurement function. Under menu set mode, if power-off, the menu status shall be stored automatically and be restored from save status after power-on, without reset each time).

Notes:

- ★ Able to use short probe (s) to measure high/low frequency scope vibration respectively.

- ★ Long probe (L) is only applicable to low frequency measurement, when measurement accelerated and frequency exceeds 1 kHz, please replace short probe to measure again.
- ★ It will be powered off automatically 3 minutes later if without any operation.

X、Maintenance

- 1、 Working environment: UT313/UT315 vibration meter is precision apparatus required to avoid collision, shock, moisture, strong power, magnetic field, oil and dust.
- 2、 Replace battery and maintenance
 - 1) in working, LCD screen shall appear symbol “  ”, user needs to replace battery timely in reference to illustration in the manual.
 - 2) please draw out battery to avoid battery weeping, which shall cause severe damage to the apparatus if you needn't use the test apparatus for

a long time.

- 3) Don't dismantle the apparatus or try to make any transformation interiorly.
- 4) Chassis cleaning: alcohol and diluents are erosive to chassis, especially to LCD window, please

XI、 Warranty

- 1) As regard warranty clause, please refer to the provided warranty card.
- 2) Dismantle of product by user at his discretion, damage after purchase resulted by improper use and altering of the warranty card and without voucher may be excluded from such warranty coverage.

XII、 Certificate

Vibration certificate comply with the following standards:

- EN61326-1:2006

XIII、 Technical Index

| Technical index | Technical parameter |
|--|---|
| Vibration collection | Piezoelectric accelerometer |
| Acceleration measurement scope | 0.1m/s ² ~199.9m/s ² (peak value) |
| Velocity measurement scope | 0.01cm/s~19.99cm/s (true valid value) |
| Displacement measurement scope | 0.001mm~1.999mm (peak peak value) |
| Measurement error | ±(5%+2dgts) |
| Acceleration measurement frequency scope | 10HZ ~ 10KHZ |
| Velocity measurement frequency scope | 10HZ ~ 1KHZ |
| Displacement measurement frequency scope | 10HZ ~ 500HZ |
| LCD display | 3 1/2 bit digit display |
| Display refresh period | 1 second |

| | |
|--------------------------------|---|
| Power supply | 9V alkaline battery |
| Power-off circuit | ≤1uA |
| Working current | ≤25mA |
| LCD backlight shut off time | Press backlight key to shut off |
| Automatic shut-off | Automatic shut-off after about 3 minutes of non-operation |
| Battery life | 20 hours of continuous use |
| Working temperature scope | 0℃ ~50℃ |
| Working humidity scope | 20%RH~80%RH |
| Storage temperature scope | -20℃ ~60℃ |
| Battery electricity indication | Battery voltage ≤7V, indicate low voltage symbol |
| Dimension | |
| Weight | |
| Elevation | 2000 m |

Appendix:**a. Mechanical Vibration Rating Table (ISO2372)**

| Vibration intensity | | Applicable to the following machine | | | |
|-------------------------------------|--|-------------------------------------|----|-----|----|
| Vibration velocity V_{rms} (mm/s) | | I | II | III | IV |
| 0.28 | | A | A | A | A |
| 0.45 | | | | | |
| 0.71 | | | | | |
| 1.12 | | B | B | B | B |
| 1.8 | | | | | |
| 2.8 | | C | C | C | C |
| 4.5 | | D | D | D | D |
| 7.1 | | | | | |
| 11.2 | | | | | |
| 18 | | | | | |
| 28 | | | | | |
| 45 | | | | | |

Notes:

1) Grade I is small-size electric motor (less than 15kW electric motor); Grade II is medium-size electric motor (15kW-75kW electric motor); Grade III is large original electric motor (hard base) ; grade IV is large original electric motor (plastic base).

2) A, B, C, D is the vibration rating. A is great, B is satisfactory, C is discontent and D is not allowed. The measurement velocity RMS value shall be on the orthogonal intersection direction of shell bearing.

b. the maximum allowable vibration for electric motor higher than 1 horsepower (NEMA MG1-12.05)

| Rotating speed (r/min) | Peak-peak displacement amplitude (μm) |
|------------------------|--|
| 3000~4000 | 25.4 |
| 1500~2999 | 38.1 |
| 1000~1499 | 50.8 |
| ≤ 999 | 63.6 |

Notes: for AC electric motor, use highest sync rotating speed; for DC electric motor, use the maximum power rotating speed; and for serial and multipurpose electric motor, use working rotating speed.

c. the maximum allowable vibration for large electric motor
(NEMA MG1-20.52)

| Rotating speed (r/min) | Peak-peak displacement amplitude (μm) |
|------------------------|--|
| 3000 and higher | 25.4 |
| 1500~2999 | 50.8 |
| 1000~1499 | 63.6 |
| ≤ 999 | 76.2 |

The above two standard are formulated by National Electrical Manufacturers Association (NEMA)

d. Preformed winding squirrel-cage induction electric motor

| Sync rotating speed (r/min) | Peak-peak displacement amplitude (μm) | |
|-----------------------------|--|---------------|
| | Plastic support | Rigid support |
| 720~1499 | 50.8 | 63.6 |
| 1500~2999 | 38.1 | 50.8 |
| ≥ 3000 | 25.4 | 25.4 |

The standard is formulated by American Petroleum Institute.

e. ISO/IS2373 the electric quality standard based on vibration speed amplitude

| Quality grade | Rotating speed (r/min) | Axis height H (mm) maximum speed vibration rms(mm/s) | | |
|---------------|------------------------|---|-----------|-----------|
| | | 80<H<132 | 132<H<225 | 225<H<400 |
| N (Normal) | 600~3600 | 1.8 | 2.8 | 4.5 |
| R (Good) | 600~1800 | 0.71 | 1.12 | 1.8 |
| | 1800~3600 | 1.12 | 1.8 | 2.8 |
| S (Special) | 600~1800 | 0.45 | 0.71 | 1.12 |
| | 1800~3600 | 0.71 | 1.12 | 1.8 |

Grade N limit value recommended in the table is only applicable to common electric motor.

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The manual information is subject to changes without prior notice.