

CONTINUATION

Dear User,

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HP SERIES USER'S MANUAL

HP Series
User Manual

高速冲击扭矩测试仪

HIGH-SPEED IMPACT TORQUE METER

For

HP-1

HP-2

HP-5

HP-10

HP-20

HP-50

HP-100

HP-200

HP-500



温州山度仪器有限公司
WENZHOU SUNDOO INSTRUMENTS CO., LTD

Packing List

Itwm	Name	Quantity
1	Main Body	1
2	Sensor	1
3	Sensor Connector Wire	1
4	Hexagon Interface Accessories(HP-200~500: without those accessories)	4
5	Connector 6 mm (HP-200~500: without that accessory)	1
6	Connector 6.3 mm (HP-200~500: without that accessory)	1
7	1/4' Tetragonal Mortise	1
8	3/8' Tetragonal Mortise	1
9	1/2' Tetragonal Mortise	1
10	M6×20 (HP-200~500: M10×40) Hexagon Socket Head Cap Screw	4+1
11	M6 (HP-200~500: M10) Hexagon Spanner	1
12	Power Adapter	1
13	Straight-through RS-232 Cable with Two-sided Holes	1
14	Software CD	1
15	Manual	1
16	Factory Inspection Report	1
17	Qualification Card	1

Thank you for your patronage to purchase HP Series High-speed Impact Torque Meter.

This High-speed Impact Torque Meter is an intelligent and multifunctional metrologic instrument which is designed for various torque testing and measuring. Please read the manual carefully before using the Torque Meter, in order to get correct torque value in the test.

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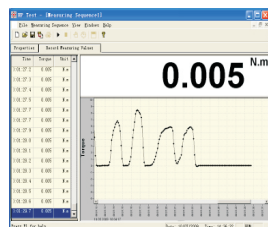
Maintainance

1. Do not exceed the capacity, otherwise the meter may be damaged, even danger will happen.
2. Do not hit or put something on the LCD.
3. Do not press the button with nail, pointed tool or objects.
4. Do not use the meter near water, oil or other liquids. Keep the meter in a dry, shady and stable place.
5. Do not open the rear cover or adjust the resistance.
6. Do not loose the fixed screws on the torque test head.
7. Use matched charger, otherwise it will cause electrical faults or fire.
8. Before using, please insert the AC charger into the socket fully. Otherwise, it may cause a short circuit, even electric shock or fire.
9. Do not use power exceeding the capacity of charger, otherwise electric shock or fire may happen.
10. In order to avoid electric shock, do not use wet hands to touch the power adapter.
11. Clean the gauge with soft cloth. First put the dry cloth in the water with detergent and then dry the cloth and clean the instrument. Do not use volatile chemical liquids, such as volatile oil, thinner, alcohol, etc.
12. Handle carefully while carrying and using the meter.
13. Do not disassemble, repair or modify the meter by yourself. It may cause the malfunction of the meter.
14. If there is something wrong with the meter, please contact the original sales department or our company.

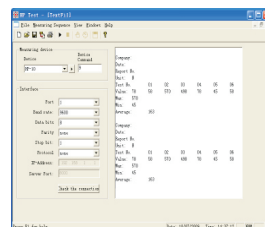
data of the instrument. Please choose the matched model and corresponding serial port, then click the start button "▶" to open the serial port and press "PRINT" on the instrument to import the stored data to the computer (See Picture 17).

Icon instruction

- "📄": The collection data is imported into EXCEL file;
- "▶": Open serial port to start test;
- "■": Close serial port to stop test;
- "👉": Collect current value manually;
- "🔄": Collect the data continuously and regularly.



Picture 16



Picture 17

Rechargeable Battery

During using the gauge, if the mark "🔋" flicker, it means that the battery is very low and need to be charged. Please use matched "DC 12V/400mA" charger. With smart charging technology, it will stop charging automatically after charging fully. Practically protect the battery durability.

Cautious

- 1、Frequent and long-playing charging will shorten battery life
- 2、Please charge when the battery only has a grid or less a grid power to avoid not to charge fully because of very low power
- 3、Charge the battery fully at least once three months

Parameter

Model	HP-1	HP-2	HP-5	HP-10	HP-20	HP-50	HP-100	HP-200	HP-500
Capacity	1N.m	2N.m	5N.m	10N.m	20N.m	50N.m	100N.m	200N.m	500N.m
Resolution	0.0005 N.m	0.001 N.m	0.002 N.m	0.005 N.m	0.01N.m	0.02N.m	0.05N.m	0.1N.m	0.2N.m
Accuracy	Within $\pm 0.5\%FS$								
Peak Collection Frequency	2000 Hz								
Test Speed	$\leq 10000rpm$								
Unit	N.m, kgf.cm, lbf.in								
Sensor Type	Sensor outside								
Power	Adaptor: DC 12V/300mA Rechargeable Battery inside: Ni-MH 8.4V 1200mAh								
Use Time	Continuous use for about 16 hours								
Standby Time	About 3 months								
Battery Life	≥ 300 times								

Function

HP Series High-speed Impact Torque Meter is an intelligent and multifunctional metrological instrument, which is designed for testing various torque. It is mainly used to detect and calibrate the torque of various electric & pneumatic screwdrivers, torque driver, torque wrench, the products which involve tightening force testing, destructive test for parts torque, etc. It has the characteristics of easy operation, high accuracy, overall functions and convenient taking. It is widely applied in the fields of electric, light industry, machinery manufacture, research institution and so on.

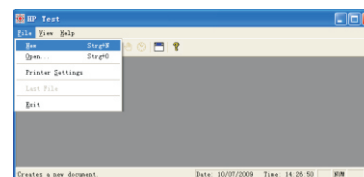
Main Features

1. High accuracy and high resolution.
2. Set and judge the upper and lower limit deviation value; red/green indicator lamp and buzzer can alarm automatically with sound and light.
3. Torque direction display.
4. Blue background light.
5. Memorize and print 10 groups of test data.
6. Print real-time tested curve of single time.
7. Calculate the average of stored data automatically.
8. Automatic converting three units(N.m, kgf.cm, lbf.in).
9. Peak-holding function.
10. Peak automatic discharge function and discharge time can be set freely.
11. It can turn off automatically if it has no operation, and the shutdown time can be set freely;
12. RS-232C output. Connecting to computer can realize curve test function; connecting to printer can print 10 groups of stored test data report or the current test curve.

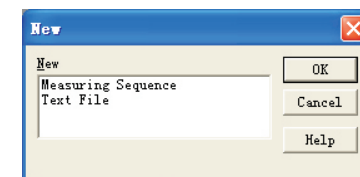
Work Environment

1. Work temperature: $20^{\circ}\text{C} \pm 10^{\circ}\text{C}$.
2. Relative humidity: 35%RH~65%RH.
3. No vibrancy and no cautery around.

- B. Turn on the power, make the instrument in working status, then set the serial port output mode as PC state.
- C. Put CD into computer drive and open software route: CD-ROM/English/Measuring software/HP/HP Test/HP Test.exe.
- D. Click "New" in the "File" option (See Picture 12).
- E. There are two modes to choose in new dialog box: Measuring Sequence and Text File (See Picture 13).

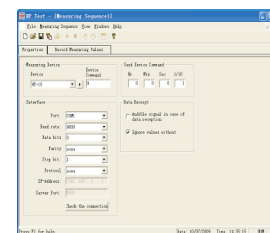


Picture 12

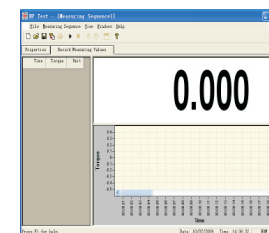


Picture 13

- F. After choosing "Measuring Sequence", please choose corresponding model and serial port, and set the time of capturing the signal of test value in Send Device Command. 1/10 means 0.1 second (See Picture 14: When Hr is 0, Min is 0, Sec is 0, 1/10 is 1, then the capturing time is 0.1 second).



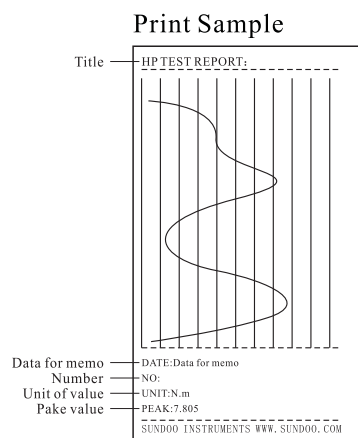
Picture 14



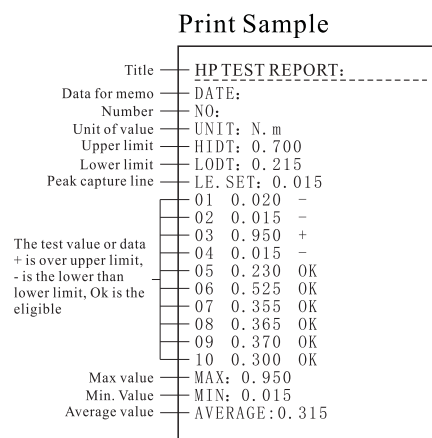
Picture 15

- G. After setting the parameters, please click "Record Measuring values" option, and switch to curve display interface. After clicking start button "▶", then click "TIMER" (⌚) to collect test data curve (See Picture 15).
- H. After finishing test, please click stop button "■" to stop testing (See Picture 16).
- I. Click save button to save the data.
- J. If you choose the Text File, it means that you can import the stored

1. When the RS-232C output is set at Pr.1, it can output to the micro-printer and print single test value curve. Press "PRINT" button, the display screen shows "Print" and print the test curve synchronously. The print sample is shown as Picture 10.
2. When the RS-232C output is set at Pr.2, it can output to micro-printer and print 10 groups of stored data. Press "PRINT" button, the display screen shows flickering "Print" and prints the test report synchronously. The print sample is shown as Picture 11.



Picture 10



Picture 11

3. When serial port output mode is PC, you can view force curve by software or input 10 groups of stored data to computer by connecting to computer. The required configuration and specific operation are as follow :

(1) Hardware environment

- A. CPU: Celeron 1G or above.
- B. Memory: 256MB or above.
- C. Hard disk available capacity: 300MB or above.
- D. Drive: CD-ROM or DVD-ROM.

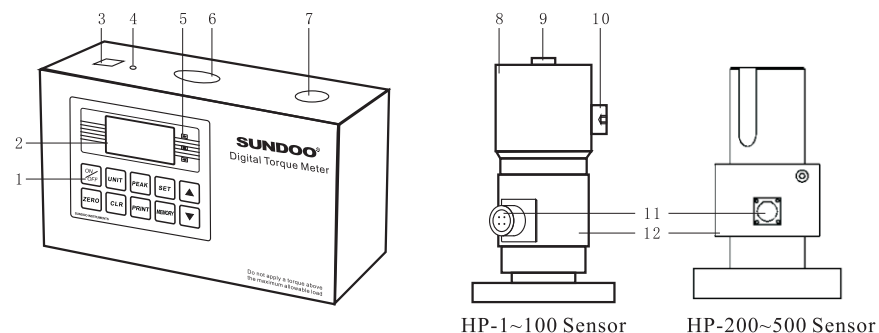
(2) Software environment

Operating system: Windows XP (32bit).

(3) Specific operation

- A. Connect the instrument to computer with straight-through RS-232 cable, which has two-sided holes.

Parts and Functions



Picture 1

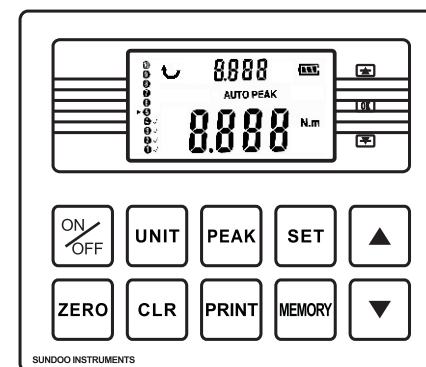
1. Function Buttons
2. LCD
3. Power Adapter Socket
4. Reset Hole

5. Indicator Lamps
6. RS-232 Port
7. Sensor Port
8. Test Head

9. Connector 6mm or 6.3mm
10. M8 Cylindrical Head Screw
11. Sensor Cable Port
12. Sensor

Note: HP-200~500: without cylindrical head screw, test head, connector 6 mm or connector 6.3 mm.

1. Function Buttons



Picture 3



ON/OFF Button

**Zero Button**

Be used for cleaning to zero, cleaning peak value and saving set value.

**Unit Conversion Button**

→ N.m → kgf.cm → lbf.in →

**Clear Button**

In the test state, pressing "CLR" can delete the data which "►" points at. Pressing "CLR" all the time can delete all the stored data.

**Peak Button**

Convert three states: peak-holding, peak-holding automatic discharge and real-time tracking of the torque. The state of real-time tracking of the torque is default.

**Print Button**

Print the current data (See Page 9).

**Memory Button**

It can be used to memorize the test values and calculate the average of stored data. Pressing the button makes the test value store into the meter. Pressing it all the time makes the screen display "AVERAGE", and the average of all the stored values can be seen.

**Set Button**

- Set upper and lower limit automatic alarm values.
- Set automatic shutdown time (1-60 minutes can be set freely, and 0 means not automatic shutdown).
- Set peak automatic discharge time (1-30 seconds can be set freely).
- Set serial port output mode.
- Set the state of background light.

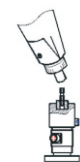
**Plus Button**

A. In the state of storing test values, pressing "▲" can make the "►" forward one location. Now pressing "MEMORY" can store the test value into this location. If there is "✓" on the right of this location, it

Note: Picture 4 is the plane dimension of test head and connector.
Picture 5 is the plane dimension of HP-200~500 sensor.

Torque Testing Process of Screwdriver

- 1.Connect the screwdriver with the sensor.
- 2.Press "PEAK" button to choose peak-holding state.
- 3.Press "ZERO" button to make the screen show zero.
- 4.Twist the screwdriver and stop it after hearing the "tick-tock" three times [keep the screwdriver and the sensor in one line (picture 7), please do not put it on one side (picture 6 and 8) or exceed force over 1kg to make it load the sensor heavily], then record the torque value showing on the screen.
- 5.Operate the above third and fourth steps five times to get the data continuously, then desert the max / min value and figure out the average, which is the torque of the screwdriver.



Wrong
Picture 6



Right
Picture 7

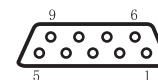


Wrong
Picture 8

Serial Port Output

The serial port output of this meter is RS-232 level, and it can connect micro-printer, computer or other external devices. The matching micro printer must support RS-232 electrical level.

Illustration of RS-232 Port



Needle	Signal	Illustration
2	TxD	output signal of SCM
3	RxD	reception signal of SCM
5	GND	signal place

Picture 9

The third time you press "SET", the display screen shows "P.OFF", and the digital box shows current automatic power off time. Pressing "▲▼" can change the current value.

The fourth time you press "SET", the display screen shows "A.PE.", and the digital box shows current peak automatic-discharge time. Pressing "▲▼" can change the current value.

The fifth time you press "SET", the display screen shows "RS 232", and the digital box shows PC, Pr.1 or Pr.2. Pressing "▲▼" can change the current state.

The sixth time you press "SET", the display screen shows "LIGHT", and the digital box shows "On" or "OFF". "On" means that the background light is on, and "OFF" means that the background light is off. Pressing "▲▼" can change the current state.

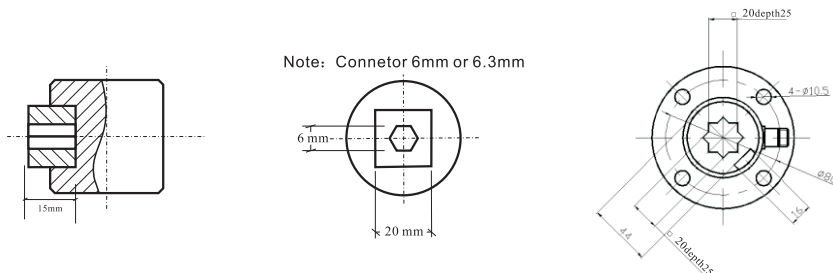
The seventh time you press "SET" can save the set value and return to the test state.

Note: In the setup process, pressing "ZERO" can save the set value and return to the test state.

6. If you want to print the test curve or stored test value, you can connect the communication interface with micro-printer to print the stored data.
7. After using this torque meter, turn off the power and put the instrument back to the box.

Test Head and Connection Dimension

1. The vertical load of the torque test head or sensor should not exceed 1kg.
2. In order to avoid damage, do not crash the torque test head (HP-200~500: without that accessory) or sensor. The dimensions of torque test head and sensor are as follow:



Picture 4

Picture 5

means that this location has stored a test value, and the new test value will replace that value and store into the location.

B. In the set state, pressing "▲" can make the set value increase. Pressing it more than two seconds can make the data increase continuously.

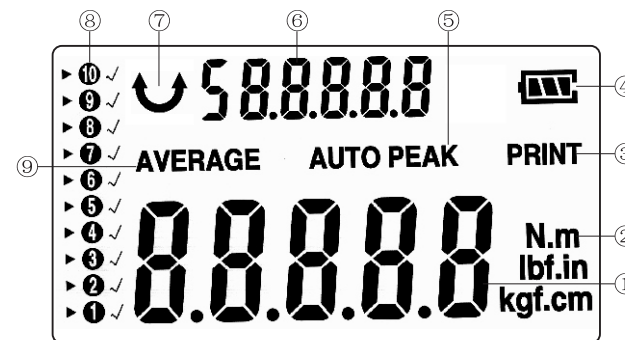


Reduce Button

A. In the state of storing test values, pressing "▼" can make the "▶" backward one location. Now pressing "MEMORY" can store the test value into this location. If there is "✓" on the right of this location, it means that this location has stored a test value, and the new test value will replace that value and store into the location.

B. In the set state, pressing "▼" can make the set value decrease. Pressing it more than two seconds can make the data decrease continuously.

2. LCD



Picture 2

- ① The reading of torque; in setting mode, the data is the setting value.
- ② Unit
Three units(N.m, kgf.cm, lbf.in) convert automatically.
- ③ Print indication. Print all the stored data or single test curve.
- ④ Electric quantity indication of battery
When the power is low, it displays "□" or flickers, meaning that the battery needs to be charged. When the battery is being charged, the

power indication "■■■" flickers.

⑤ Peak value indication

When it displays "PEAK" on LCD screen, it is max test value in locked status; when it displays "AUTO PEAK", the peak is in automatic discharge status after the set time.

⑥ Stored test value, average of the stored data or the symbols of indication function at the set state.

⑦ Clockwise direction "↻", counterclockwise direction "↺".

⑧ Store test value

"12345678910" ten locations, each location can store one test value;

"▶" shows that it is current stored reading location;

"√" shows that the location has already stored test value.

⑨ Average indication of stored test values.

3. Power Adapter Socket: 12VDC, 300mA.

4. Reset Hole

Be used to restart the instrument when it is disturbed strongly.

5. Indicator Lamps

☀ indicator lamp of upper limit alarm value

OK normal value indicator lamp

☹ indicator lamp of lower limit alarm value

In the work state, if test value is in the range of upper and lower limit deviation, normal value indicator lamp "OK" will light, meaning that it is eligible; if test value exceeds upper limit value, the indicator lamp of upper limit "☀" will light, and the buzzer alarms, meaning that it is not eligible; If the test value is less than lower limit value, the indicator lamp of lower limit "☹" will light, and the buzzer alarms, meaning that it is also not eligible. This can inform users that the test result isn't in the range.

6. RS-232 Port

RS-232 port output is used to connect computer, printer or other outside devices.

7. Sensor Port

It is a port of signal input and used to combine with the sensor.

8. Test Head: transfer the torque load to the sensor.

9. Connector 6mm or 6.3mm.

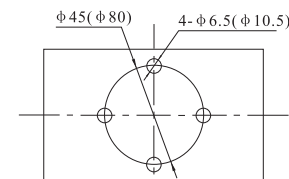
10. M8 Cylindrical Head Screw: lock test head.

11. Sensor Cable Port.

12. Sensor.

Operation Process

1. Open the instrument and check the power, if the screen displays "□", it means lack of power. Then please put the power adapter into the charging port, and plug into AC 220V/50HZ. "■■■" flickers, which indicates that it is being charged. The instrument can automatically count the charging time, and it can stop charging when it is full. It can be charged no matter it is power on or off, and it can be used to test even though it is being charged.
2. Fix the sensor on the test bench by screws and ensure that it will not be moved when it is in the maximum torque.



Sensor Installation Dimension

Note: the data in bracket is the sensor dimension of HP-200~500.

3. Under normal circumstances, open the power switch, and the test value shows zero. If the torque value is not zero, pressing Zero button can make the torque reading return to zero.
4. Press the Unit button to select the torque unit as you need.
5. Set upper and lower limit values, automatic power-off time, peak automatic discharge time, RS-232C output connection option and background light switch. Specific operations are as follow:
The first time you press "SET", the display screen shows "HIDT", and the digital box shows current automatic alarm upper value. Pressing "▲▼" can change the current value.
The second time you press "SET", the display screen shows "LODT", and the digital box shows current automatic alarm lower value. Pressing "▲▼" can change the current value.