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IST-HP SERIES

IST-HP SERIES
DIGITAL TORQUE TESTERS
OPERATION MANUAL

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MN-IST-HP Series-E

V1

SPECIFICATION

Code	IST-HP1	IST-HP2	IST-HP5	IST-HP10	IST-HP20
Maximum range	1N.m	2N.m	5N.m	10N.m	20N.m
Resolution	0.0005N.m	0.001N.m	0.002N.m	0.005N.m	0.01N.m
Accuracy	±1%				
Maximum speed	3000rpm				
Storage capacity	10 groups				
Power supply	built-in rechargeable battery				
Dimension	230×110×50mm				
Weight	2.4kg				

STANDARD DELIVERY

Main unit	1 pc
Buffer	1 pc
Adaptor	4 pcs
Power adapter	1 pc
RS232 and software	1 pc

Function

IST-HP Series Digital Torque Meter is an intelligent multi-function measurement instrument and can be used for testing various torque. It is mainly used for testing and calibrating the torque of various electric/ pneumatic screwdriver (speed is less than 3000rpm)/torque driver/torque wrench. It is also used for testing tightening force of other products and destructive test of parts torsional.

It has high accuracy, easy to operate and handy to carry out, which are widely used in electric, light industry, machinery manufacture, scientific research, and so on.

Feature Description:

Fixing knob: Used to fix the torque tester on the test bench.

Reset hole: used to force the instrument to restart for strong interference

Power adapter jack: For power adapter 12VDC,300mA.

Fuse holder: Built-in fuse for protection due to current overload.

Main characteristics

1. High accuracy and high resolution.
2. Free setting and judgment of upper and lower limit deviation value, red/ green indication lamps and buzzer can alarm automatically with sound and light.
3. Torque Direction display.
4. Blue Background light.
5. Store and print 10 groups test value.
6. Real-time printing of single time test curve.
7. Calculate the average of stored data automatically.
8. Convert three units (N.m, kgf.cm , lbf.in) automatically.
9. Peak-holding function.
10. Peak automatic diacharge 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 or current test curve.

Work Environment

1. Temperature:0℃−40℃.
2. Relative humidity:35%RH～65%RH.
3. No vibrancy and no cautery around.

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.
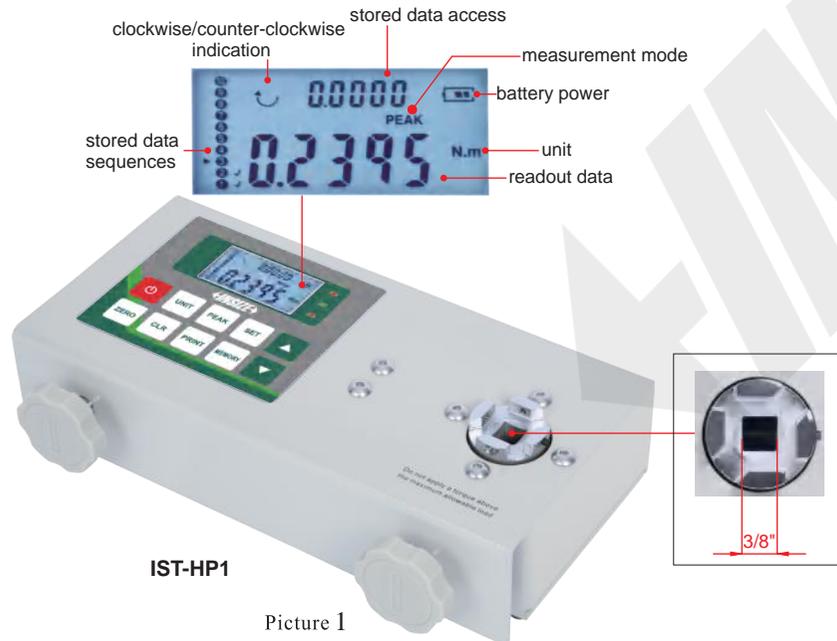
Precautions:
Avoid frequent charging and prolonged charging, as this will shorten the battery life. Charge the device when battery level is at one bar or less to prevent a reduction in battery capacity and ensure that the battery is fully charged. The battery inside device must be fully charged at least once every three months.
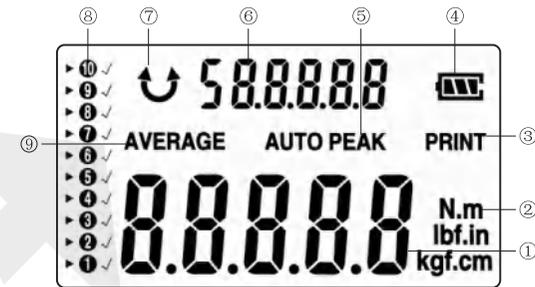
⚠️ **Note:**
If the battery level does not match the actual display, perform a full charge and discharge cycle, charging until the charging bar stops flashing and displays a full charge.

Parts and Functions

clockwise/counter-clockwise indication
stored data access
measurement mode
battery power
stored data sequences
unit
readout data

IST-HP1

Picture 1

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1. LCD

Picture 2

① Torque test value reading, under setting status, it displays set value.
② Torque unit: three different units of measurement (N.m, lbf.in, kgf.cm) can realize automatic conversion.
③ Printing indication, print all 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 dis charge status.
⑥ Stored test value, average of the stored data or the symbols of indication function at the set state.
⑦ The symbol of torque direction
   " ↑ " is clockwise, " ↗ " is counterclockwise.
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 symbol of stored test data.

2. Function Buttons

Power ON / OFF

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

Unit Button
N.m → kgf.cm → lbf.in

Clear Button
In the state of testing, pressing " CLEAR " will delete the data which " ▶ " points at; pressing " CLEAR " all the time will delete all the memory testing data.

Peak Button
Converting three states: peak-holding, peak-holding automatic discharge and real-time tracking of torque value. Real-time tracking of torque value is default status after power on.

Print Button
Be used for printing current data (See details on Page 9).

Memory
Be used for saving test value and calculating the average of stored data; Pressing " MEMORY " can store test value on the LCD screen; Pressing the button all the time and the LCD will display "AVERAGE", thus you could view the average of all stored value.

Set Button
A. Setting upper and lower limit automatic alarm values.
B. Setting peak-holding automatic discharge time (free setting from 1~30 seconds).
C. Setting automatic shutdown time (free setting from1~60minutes, 0 is not automatic shutdown).
D. Setting serial port output mode.
E. Setting ON/OFF status of blue background light.

Add Button
A. Under storing test value status, press" ▲ ", and " ▶ "symbol will forward location. Pressing the " MEMORY " can store test value on the LCD screen. If there is" √ " symbol beside the location, it means that test value has been stored into the location, and the new test value will replace previous stored value.
B. Under setting status, press" ▲ " and the set value will increase. If you press it all the time, the data will increase continuously.

Reduce Button
A. Under storing test value status, press " ▼ ", and " ▶ "symbol will backward one location. Pressing the " MEMORY " can store test value on the LCD screen. If there is " √ " symbol beside the location, it means that test value has been stored into the location, and the new test value will replace previous stored value.
B. Under setting status, press " ▼ " and the set value will decrease. If you press it all the time, the data will decrease continuously.

3. Fixture knobs
It is used to fix the meter on the test stand.

4. Torque test heads
They can be combined with clamps to transmit the torque load to the sensor .

5. The Pilot lamp of upper and lower limit automatic alarm
▲ Pilot lamp of upper limited alarm
OK Normal value indicator lamp
▼ Pilot lamp of lower limited alarm(Power ON indicator light)

Under test status, 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. Communication interface
RS-232C port output is used for connecting printer, PC or other equipments.

7. Reset hole
Be used for restart the instrument when it is disturbed strongly.

## 8. Power adapter socket
Applied with power adapter DC 12V, 300mA.

Operation Process

1. Turn on the instrument and check the power supply. If it shows " ▭ " on LCD screen , it means lack of electricity , and the battery group needs to be charged. The method is as follow: Please put the matched power adapter into the charging port, and plug into AC 220V/50HZ. If "◣◣◥" flickers,it means that it is being charged. The instrument can automatically calculate the charging time, and it can stop charging when it is full. It can be charged no matter power on or off, and it can be used to test even though it is being charged.

2. Please use fixture knobs to fix torque meter.

3. Normally, the value is zero when the meter is on. If the value is not zero, please press zero button to clear .

4. Press unit button to choose the unit as you required.

5. Setting upper and lower limit deviation values, automatic power-off time, peak-holding automatic discharge time, serial port output mode and background light ON/OFF choice:

   Press "SET" for the first time, the LCD screen will display "HIDT", and the digital box displays current upper limit value. Pressing "▲▼" can change current value.

   Press "SET" for the second time, the LCD screen will display "LODT", and the digital box displays current lower limit value. Pressing "▲▼" can change current value.

   Press "SET" for the third time, the LCD screen will display "P.OFF", and the digital box displays automatic power-off time. Pressing "▲▼" can change current value.

   Press "SET" for the fourth time, the LCD screen will display "A.PE', and the digital box displays peak holding automatic-discharge time. Pressing "▲▼" can change current value.

   Press "SET" for the fifth time, the LCD screen will display "RS232", and the digital box displays PC, Pr.1or Pr2. Pressing "▲▼" can change current status.

   Press "SET" for the sixth time, the LCD screen will display "LIGHT" , and the digital box displays "ON"or " OFF". " ON " means background lamp is lighting, "OFF" means background lamp isn't lighting. Pressing "▲▼" can change current status.

   Pressing "▲▼" for the seventh time, the instrument will save all changed settings and back to working condition.

   Note: During setting, pressing "ZERO" can save setting and back to test condition.

6. According to test requirements, please choose proper buffer and fix it on torque test head.

7. If you want to test torque of other rotational tool or items expect screwdrive , please choose other proper connectors

8. If you want to print test curve or stored torque value, connecting with micro printer via instrument communication interface can realize the printing of stored data.

9. After using the torque meter, firstly remove the buffer and connector, then turn off the meter, and put back to instrument box.

Test Process of Screwdriver Torque

1. First fix the buffer on the torque test head and then install the screwdriver on the buffer.

2. Press the PEAK button and choose peak-hold mode.

3. Press ZERO button and the torque value on the LCD will be zero.

4. Writhe the screwdriver, and stop writhing it when you hear three times sound from screwdriver (Please keep screwdriver and sensor in a line during testing, see picture 3), don't use screwdriver with wrong direction like picture 3 or above 1kg pressure, then record the test value on LCD.

5. Repeat the third/fourth procedures continuously for five times, and you will get five times data. Abandon max and min, and obtain the average, which is the torque value from this screwdriver.

Wrong   Right   Wrong
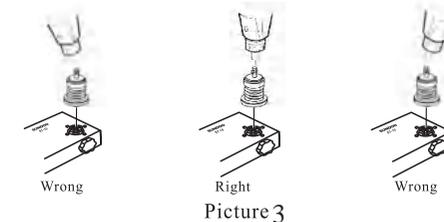
Picture 3

## Torque Measuring Head and Connection Dimension
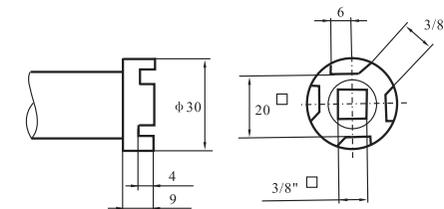
Picture 4

1. Install the buffer very rightly on the torque test head while operating.
2. The vertical load of the torque test head should not exceed 1kg.
3. The torque test head should avoid collision to prevent any damage. The torque test head plane size is the following (picture 4).

Buffer's Test Range, Installment and Inspection

1. Buffer's test range

Accessories
Assembly   Connection bearing   Small spring
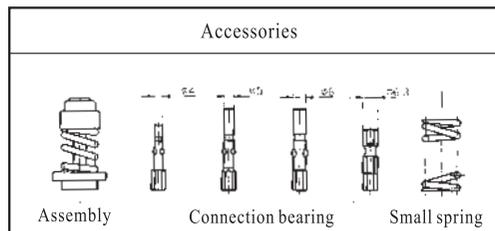
2. Buffer's installment
　①. In compliance with the test need, choose the suitable connecting axis and spring to equip the buffer's assembly(Picture 5).
　②. If there is not suitable connecting shaft, use M4 screwed hole on ◯6.3. Spin the screw with nut into thread hole, and tighten nut . Please use the + head on the screw.

3. Buffer's inspection
　①. Please check the buffer before operation. The accuracy will be affected if there is dust, oil lack and bending of connecting axis.
　②. Check the bearing of the buffer regularly. Long -time repetitive using leads to the attrition of the bearing, making the buffer not rotate smoothly and influencing the torque test value.
　③. If the assembly is loose completely, please twist the screw of the middle into more than 2mm in your hands to avoid the screw be damaged in the process of testing.
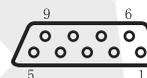

Picture 5

Port Output and Print

This meter is RS-232C level output, which can be connected with printer, computer or other equipments. The matching micro printer must support RS-232C electrical level. The setting method of RS-232 port output is in the next.

Illustration of RS-232 Port

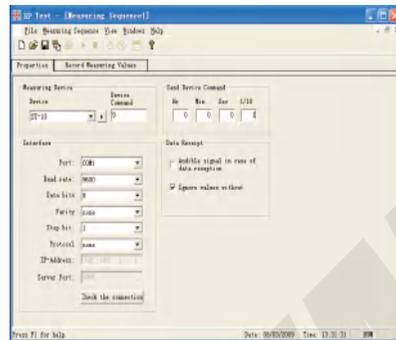| Needle	Signal	Illustration
2	TxD	output signal of SCM
3	RxD	reception signal SCM
5	GND	Signal place

1. When RS-232C output is set at Pr.1, it means the single tested Curve will be printed. Press " PRINT " , and "Print" will appear on the screen, then test curve will be printed synchronously in the process of testing.
2. When RS-232C output is set at Pr.2, the screen will flicker and show "Print". When " PRINT " is pressed and ten groups of data and analysis report will be printed synchronously.
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.
　（2）Software environment
　　　Operating system: Windows XP (32bit).
　（3）Specific operation
　　　A. Connect force gauge with computer via RS232 cable.
　　　B. Turn on the gauge power, make it in working status, then set the serial ports mode as PC state.
　　　C. Open the USB flash drive software HP Test.exe
　　　D. Click "New" in the "File" option (See Picture 6).
　　　E. There are two modes to choose in new dialog box: Measuring Sequence and Test File
　　　F. After choosing "Measuring Sequence", please choose corresponding model and serial port, and set the time of capturing the signal of force value in Send Device Command. 1/10 means 0.1 second (See Picture 7 : When Hr is 0, Min is 0, Sec is 0, 1/10 is 1, then the capturing time is 0.1 second).
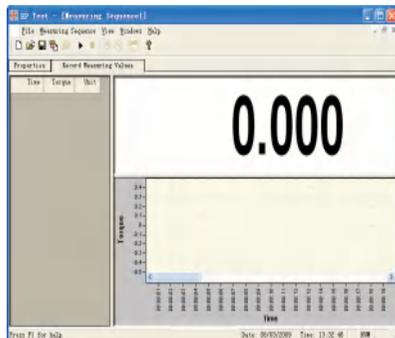
G. After setting the parameters, please click "Record Measuring values"
   option, and switch to curve display interface.

H. After clicking start button " ▶ ", then click "TIMER" (⊘) to collect test data
   curve (See Picture 8).

I. After finishing test, please click stop button " ■ " to stop testing(See Picture 9)
   Click the Save option in the File menu to save the data.

J.   " 🗗 "： The collection data is imported into EXCEL file;

     " ▶ "： Open serial port to start test;

     " ■ "： Close serial port to stop test;

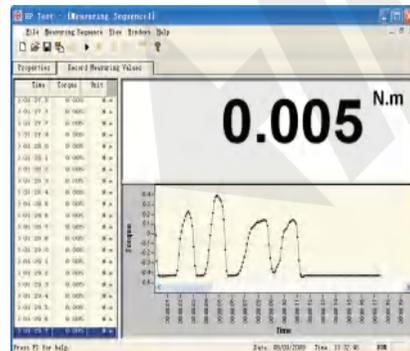   " 🖑 "： Collect current value manually;

     " ⊘ "： Collect the data continuously and regularly.
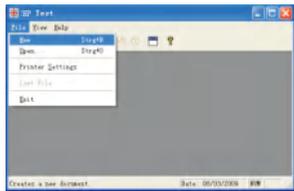
Picture 6

Picture 7

Picture 8

Picture 9