CONTINUATION

Dear User,

We're pleased for your patronage of purchasing ST-B Series Digital Cap Torque Meter. Before using the instrument, please read the manual carefully and keep it well to give you help when you can't learn it or there is something wrong with it.

Description in the manual is based on the newest products. Owing to improvement or other changes, contents of manual may differ from practical situation. Our company will reserve the right of recension at any moment. Please kindly forgive not to notify the revised places one by one.

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SUNDOO®
ADVANCED PRECISION INSTRUMENT

ST-B SERIES USER'S MANUAL

ST-B Series
User Manual
瓶 盖 扭 矩 测 试 仪
DIGITAL CAP TORQUE METER

For
ST-1B
ST-2B
ST-5B
ST-10B
ST-20B

CE CNAS

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

Thank you for your patronage to purchase ST-B Series Digital Cap Torque Meter.

The Digital Cap Torque Meter is designed and manufactured for testing a variety of torque as an intelligent multifunctional measurement instrument. Please read this manual carefully before using this instrument in order to take full advantage of this instrument all functions, and get the correct torque value.

CONTENTS

Specification and Parameter

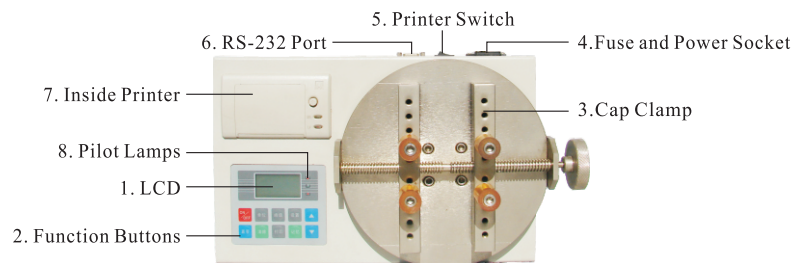| Model	ST-1B	ST-2B	ST-5B	ST-10B	ST-20B
Capacity	1N.m	2N.m	5N.m	10N.m	20N.m
Resolution	0.0005N.m	0.001N.m	0.002N.m	0.005N.m	0.01N.m
Accuracy	±0.5%FS				
Unit	N.m、kgf.cm、lbf.in				
Test Sample Diameter	15mm-200mm				
Sensor Type	Sensor Inside				
Power	AC 220V ,50Hz				

Function

ST-B Series Digital Cap Torque Meter is designed and manufactured for testing various torque as an intelligent multifunctional measurement instrument. It maily be used for testing and calibrating torque of various caps and bulb holders , and also be used for testing tightening force of other products and destructive test of parts torsion with easy operation, high accuracy, multifunction and handy to carry. The instrument is widely used in various electrical and light industry, machinery manufacturing, scientific research and other industries.

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 backlight.
5. Memory and print 10 test values.
6. Calculate average of stored data automatically.
7. Convert three units (N.m, kgf.cm, lbf.in) automatically.
8. Peak-hold function, peak automatic discharge function and discharge time can be set freely.
9. It can turn off automatically without any operation, and the shutdown time can be set freely.
10. RS-232 output, data can be transfered into computer, printer and other outer equipments.

Parts and Functions

5. Printer Switch
6. RS-232 Port
4.Fuse and Power Socket
7. Inside Printer
3.Cap Clamp
8. Pilot Lamps
1. LCD
2. Function Buttons

Picture 1

dry, shady and stable place;
5. Do not open the rear cover or adjust the resistance;
6. Do not loose the fixed screw on the torque measuring head;
7. Before using it please insert the AC charger in the socket completely. Lose plug may lead to fire or electric shocks caused by short circuit;
8. Do not plug in or out with wet hand to avoid electric shock;
9. Clean the gauge with soft cloth. First put the dry cloth in the water with detergent and then dry the cloth and clean the meter. Do not use volatile chemical substance such as volatile oil, thinner, alcohol, etc;
10. Handle carefully while carrying and using the meter;
11. Do not disassemble, repair or modify the meter yourself, which may cause permanent fault of the meter;
12. If there is something wrong with the meter, please contact the original sales department or our company.

Packing List

| Item	Parts Name	Quantity
1	ST-B Main Body	1
2	Power Cable	1
3	Straight-through RS-232 Cable with Two-sided Holes	1
4	Rubber Clamp	4
5	Key of Hand Case	2
6	M8 Inner-Hexagon Spanner	1
7	Software CD	1
8	Manual	1
9	Qualification Certificate	1
10	Factory Inspection Report	1

H. After finishing test, please click stop button "■" to stop testing (See Picture 11).

I. Click "save" in File menu to save the data.

J. If you choose the Text File, it means that you can import the sto-red data of this meter. Please choose the matched model and co-rresponding port, then click the start button " ▶ " to open the serial port and press " PRINT " on this meter to import the stored data to the computer (See Picture 12).
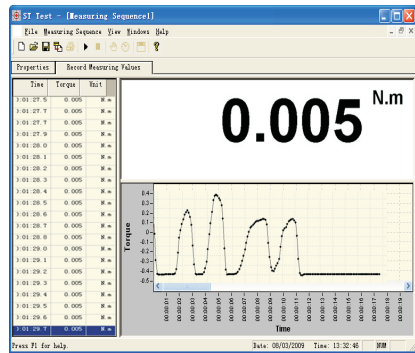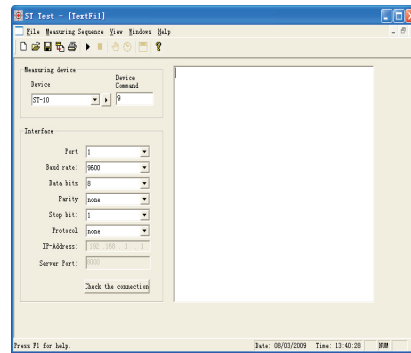
| Picture 11 | Picture 12 |

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.

Cautions and Maintenance

1. Do not apply a torque above 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

1、LCD
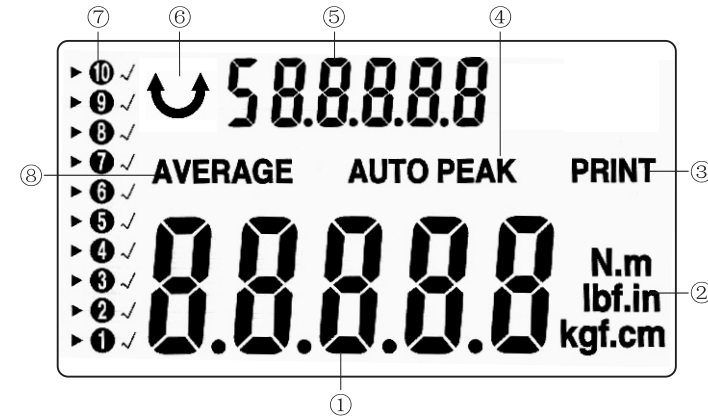
Picture 2

① Torque value reading, and under setting status, it is set value.

② Torque unit

Three different torque units: N.m, lbf.in, kgf.cm and automatic conversion.

③ Printing indication, and print all stored data.

④ Peak 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.

⑤ Stored test value, average of the stored data or the symbols of indication function at the set state.

⑥ Symbol of torque direction: "↰" is clockwise, "↱" is counterclockwise.

⑦ Stored torque value

"❶❷❸❹❺❻❼❽❾❿" ten cells, each cell can save one torque value.

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

"✓" shows that torque value has already stored into the location.

⑧ Average indication of stored torque data.

2. Function Button
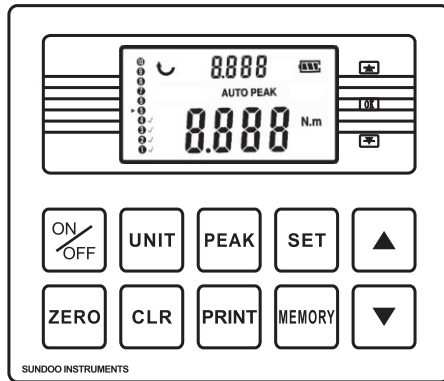
Picture 3

ON / OFF Button

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

Unit Button
N.m ⟶ kgf.cm ⟶ lbf.in

Clear Button
Under test status , pressing the "CLR" could delete the data in the cell of " √ " symbol.And pressing the "CLR" all the time could delete all stored data.

Peak Button
Convert three status: peak-hold, peak-hold automatic discharge and load real-time tracking. Load real-time tracking is default status after power on.

Print Button
Print data of current state (View details on page 7).

B. Turn on the meter, and make it under working status, then set the port mode as PC state(See setting method on Page 7).

C. Put CD into computer drive and open software route: CD-ROM/English/ Measuring software/ST-B/ST-B Test/ST-B Test.exe.

D. Click "New" in the "File" option (See Picture 7).

E. There are two modes to choose in new dialog box: Measuring Sequence and Test File (See Picture 8).
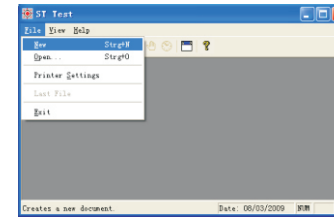
Picture 7
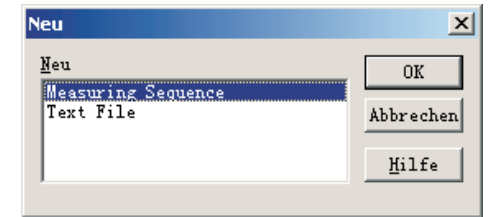
Picture 8

F. After choosing "Measuring Sequence", please choose corresponding model and port, and set the time of capturing the signal of torque value in Send Device Command. 1/10 means 0.1 second (See Picture 9: 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. After clicking start button " ▶ ", then click "TIMER" (⊚) to collect test data curve (See Picture 10).
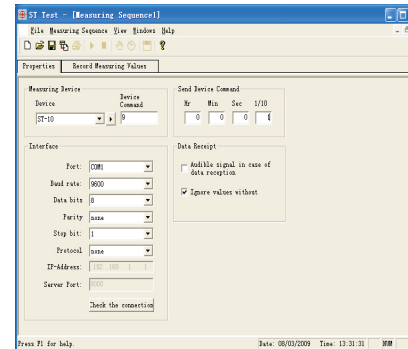
Picture 9
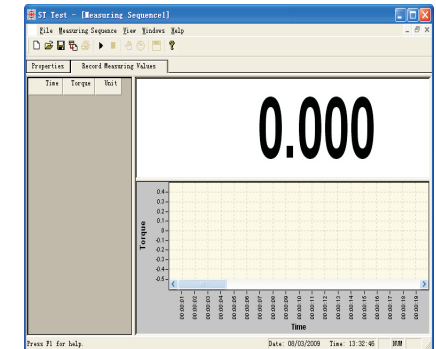
Picture 10

Port Output and Print

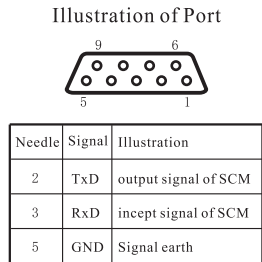This meter is RS-232C port output, and outer equipment must support RS-232C port output. You can transfer test data into computer and you can also press the "PRINT" to print the test data through inside micro printer.

1. When port output mode is "Print", you can transfer data into inside micro printer directly. Port needle and print sample are the following pictures (Picture 5 and Picture 6).

Illustration of Port

Needle	Signal	Illustration
2	TxD	output signal of SCM
3	RxD	incept signal of SCM
5	GND	Signal earth

Picture 5

Print Sample

Title — ST-10B TEST REPORT:
Date for memo — DATE:
Number — NO:
Unit — UNIT: N.m
Upper Limit — HIDT: 7.000
Lower Limit — LODT: 2.150
Minimum Captured Value — LE.SET: 0.150

```
01  0.200  —
02  0.150  —
03  9.500  +
04  0.150  —
05  2.300  OK
06  5.250  OK
07  3.550  OK
08  3.650  OK
09  3.700  OK
10  3.000  OK
```

Test Value/Data:
+ is over upper limit, - is lower than lower limit, Ok is the eligible

Max. Value — MAX: 9.500
Min. Value — MIN: 0.150
Average Value — AVERAGE: 3.150

Picture 6

2. When port output mode is PC, you can view torque curve by software or input 10 groups of stored data to computer by connecting 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 meter to computer with straight-through RS232 cable, which has two-sided holes.

MEMORY   Memory Button

Be used for saving and calculating the average of stored data,and pressing "MEMORY" could save the displsy testing value into the instrument. press the "MEMORY" all the time, then the screen shows "AVERAGE", then the average of all stored data could be viewed. The instrument could save 10 testing value. When do the eleventh test, the eleventh value will replace the first value, to save into the instrument. Pressing "▲" "▼" could change the storage location.

SET   Set Button

A. Set upper and lower limit automatic alarm values.
B. Set min captured value for storage.
C. Set automatic shutdown time (free setting from1~60minutes, 0 is not automatic shutdown).
D. Set peak-hold automatic discharge time (free setting from 1~10 seconds).
E. Set RS-232C port output mode.

▲   Plus Button

A. Under storing test value status, press "▲", and "►"symbol will forward one location.This moment,pressing "MEMORY" could save the display testing value into the cell.If there is " √ " symbol beside the lo-cation, 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. This moment,pressing "MEMORY" could save display testing value into the cell. 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. Cap Clamp: Special grip of cap torque test.

4. Fuse and power socket: Fuse inside is used for protecting the meter owing to overload electric current.

5. Switch ON/OFF of inside printer.

6. RS-232 Port

   RS-232 output, data can be transfered into computer, micro printer and other outer equipments.

7. Inside micro printer

   Print 10 groups of stored data, including test value, maximum, minimum, average.

8. Automatic alarm indicator lamps of upper and lower limit deviation value.

   "▲" indicator lamp of upper limit alarm value.

   "OK" normal value indicator lamp.

   "▼" indicator lamp of lower limit alarm value.

   Under working 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 ind-icator lamp of lower limit "▼" will light, and the buzzer alarms, mean-ing that it is also not eligible. This can inform users that the test result isn't in the range.

Operation Environment

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

Operation Process

1. Connect power (Input:AC220V50HZ) and press switch ON/OFF .
2. Normally, the value on screen is zero when the meter is turned on.
   If the value is not zero, please press zero button to clear to zero.
3. Choose unit by pressing unit button according to test requirement.
4. Choose Test Mode

After power on, the default state is load real-time tracking, and there is no "PEAK" on screen; press "PEAK", and the screen will display "PEAK" and enter into peak-hold status , and the reading of instrument is max value which test bar can bear during testing . Press "PEAK" again, the LCD screen will display "AUTO PEAK"and enter into peak-hold automatic discharge status, and the instrument will clean to zero automatically according to preset time.

5. Set upper and lower limit deviation values, min captured value, automatic power-off time, peak-hold automatic discharge time, and port output mode.

   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 "LE.SET", and the digital box displays min captured value for storage. Pressing "▲▼" can change current value.

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

   Press "SET" for the sixth time, the LCD screen will display "RS232", and the digital box displays PC or Print. Pressing "▲▼" can change current status; PC is the status of connecting computer; Print is the status of im-porting data into inside printer directly.

   Press "SET" for the seventh time, the instrument will save all changed se-ttings and be back to working condition.

   Note: During setting, pressing "ZERO" can save settings and be back to working condition.

6. Turn big nut on right side of meter,and adjust to suitable width, loosen rubber clamp with spanner to adjust place for specimen.

7. Test data can be transfered into computer for analysis, saving and print-ing via RS-232 cable.

8. After finishing test, turn off the meter, and put it back into instrument case.