CONTINUATION

Dear User,

We're pleased for your patronage of purchasing ST-R Series Dynamic 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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Ver:1.10 Con:20170302

SUNDOO®
ADVANCED PRECISION INSTRUMENT

ST-R SERIES USER'S MANUAL

ST-R系列
使用说明书

数字式动态扭矩测试仪
DIGITAL TORQUE METER

For
ST-1R
ST-2R
ST-5R
ST-10R
ST-20R
ST-50R
ST-100R
ST-200R
ST-500R

CE CNAS

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

Thank you very much for your patronage to purchase ST-R Series Digital Dynamic Torque Meter.
ST-R Series Digital Torque Meter is an intelligent multi-function meter. It is designed and manufactured for testing various dynamic torque. In order to take full advantage of all function of this meter and obtain correct torque value, please read the manual carefully before using it.

CONTENT

Specification and Parameter ……1
Function ……2
Operation Environment ……2
Main Characteristics ……2
Parts and Functions ……3
Operation Process ……8
Port Output and Print ……9
Cautions and Maintenance ……12
Packing List ……13

Packing List

Item	Parts Name	Quantity
1	Instrument Case	1
2	Dynamic Sensor	1
3	Power Wire	1
4	Sensor Cable for Connection	1
5	Straight-through RS-232 Cable with Two-sided Holes	1
6	Software CD	1
7	Manual	1
8	Product Qualified Certificate	1
9	Factory Inspection Report	1

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 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. Use matched charger, or electric break-down or fire will happen.
8. 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.
9. Do not use power exceeding the capacity of charger, or electric shock or fire may happen.
10. Do not plug in or out with wet hand to avoid electric shock.
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 meter. Do not use volatile chemical substance 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 yourself, which may cause permanent fault of the meter.
14. If there is something wrong with the meter, please contact the original sales department or our company.

Specification and Parameter

Model	ST-1R	ST-2R	ST-5R	ST-10R	ST-20R	ST-50R	ST-100R	ST-200R	ST-500R
Capacity	1 N.m	2 N.m	5 N.m	10 N.m	20 N.m	50 N.m	100 N.m	200 N.m	500 N.m
Resolation	0.0005 N.m	0.001 N.m	0.002 N.m	0.005 N.m	0.01 N.m	0.02 N.m	0.05 N.m	0.1 N.m	0.2 N.m
Connection Axis Size	φ30mm							φ50mm	
Accuracy	±1% FS					±2% FS			
Max Speed	1000 rpm								
Power	220V±10%V 100W								
Instrument Case Dimension	L260×W160×H135 mm								

Function

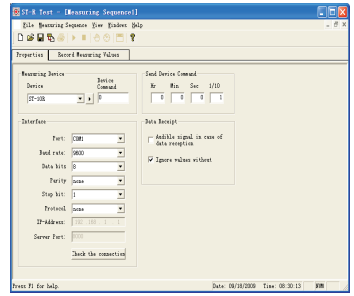
ST-R Series Digital Torque Meter is an intelligent multi-function meter. It is designed and manufactured for testing various dynamic torque. It is used for testing and calibrating output torque of various motors and reduction gears and be widely used in motor industry, machinery manufacturing, scientific research institutions and other industries.

Operation Environment

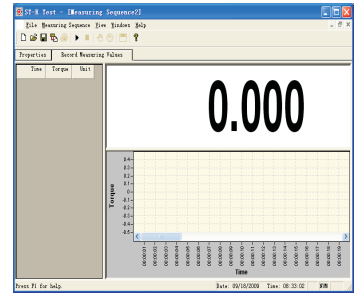
1. Temperature: 0℃-40℃.
2. Relative humidity: 35%RH-65%RH.
3. No vibrancy and no cautery around.

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/light.
3. Torque direction display.
4. Blue backlight.
5. Store and print 10 test values.
6. Real-time printing of single test curue.
7. Calculate average of stored data automatically.
8. Three units:N.m, kgf.cm, lbf.in, and automatic conversion.
9. Peak hold function.
10. Peak hold automatic discharge function and discharge time can be set freely.
11. Automatic shutdown without any operation and shutdown time can be set freely.
12. Inside printer, and print 10 groups of stored test data to judge max, min, average, qualified and unqualified value.
13. Port (RS-232C) output, be used for connecting computer with software.



Picture 11



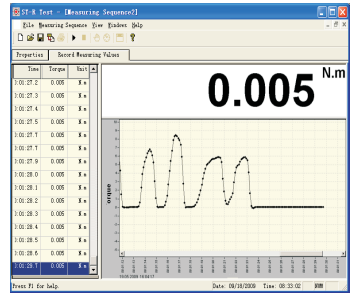
Picture 12

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 12).

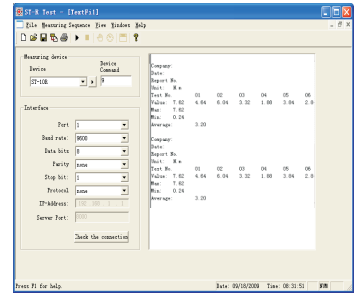
H. After finishing test, please click stop button " ■ " to stop testing (See Picture 13).

I. Click save button to save the data.

J. If you choose the Text File, it means that you can import the stored data of the meter. Please choose the matched model and corresponding serial port, then click the start button " ▶ " to open the serial port and press " ▶ " on the meter to import the stored data to the computer (See Picture 14).

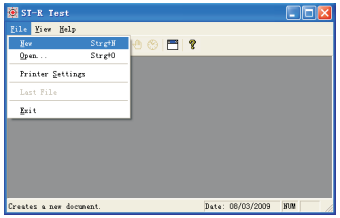


Picture 13



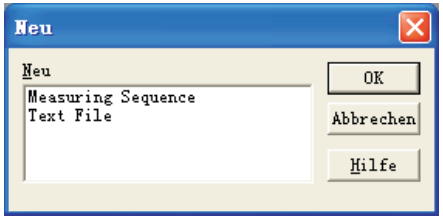
Picture 14

A. Connect this meter with computer via straight-through RS232 cable with two-sided holes.
B. Turn on power, make it in working status, then set the port output mode as PC state(See setting method on Page8).
C. Put CD into computer drive and open software route: CD-ROM/ English/Measuring software/ST-R/ST-R Test/ST-R Test.exe.
D. Click "New" in the "File" option (See Picture 9).



Picture 9

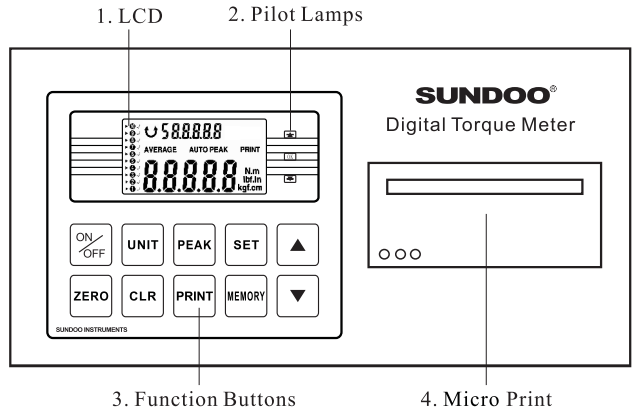
E. There are two modes to choose in new dialog box: Measuring Sequence and Test File (See Picture 10).



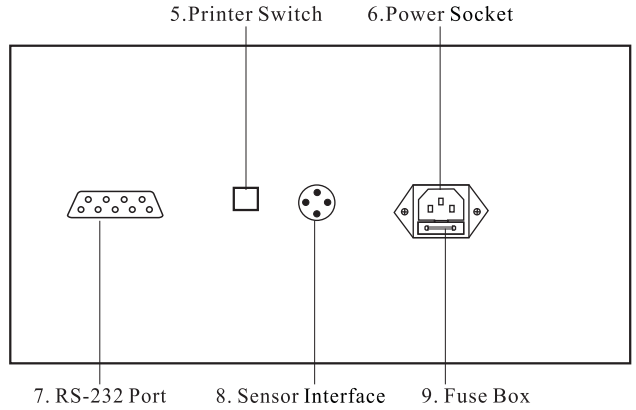
Picture 10

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 11: When Hr is 0, Min is 0, Sec is 0, 1/10 is 1, then the capturing time is 0.1 second).

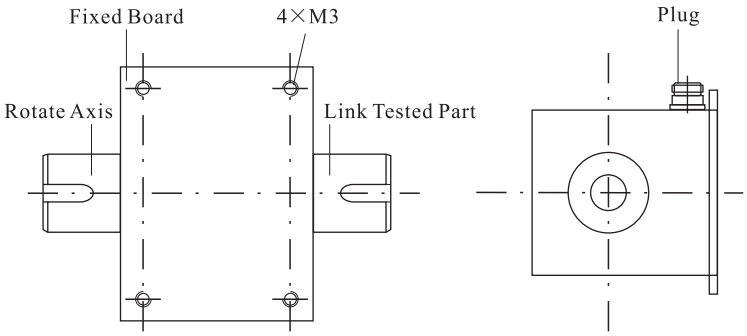
Parts and Functions



Picture 1（Front of instrument）

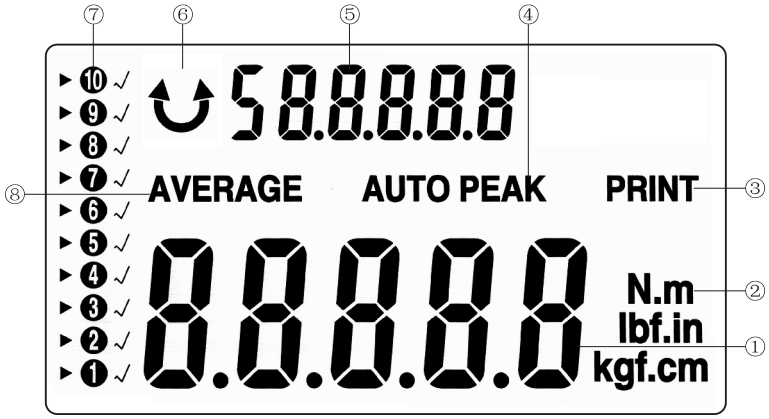


Picture 2（Back of instrument）



Picture 3（Sonser）

1、LCD



Picture 4

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 or single test curve.

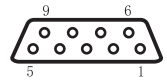
④ Peak indication

When it displays " PEAK" on LCD screen, it is max test value in locked

Port Output and Print

This meter is RS-232 electric level output. The matching outer equipments must support RS-232 electric level. The data output mode of RS-232 port is the following:

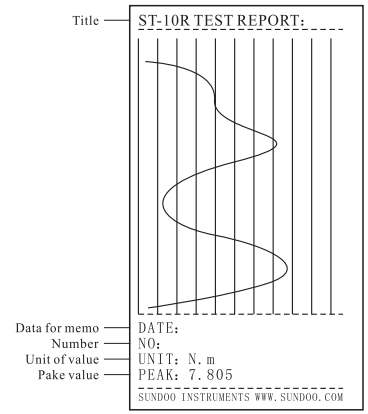
Illustration of RS-232 Port



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

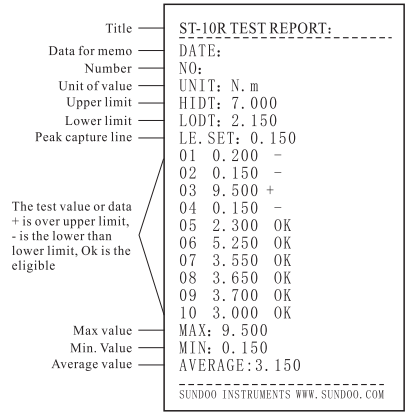
1. When RS-232 port output is set at Pr.1, it is exported to micro printer and single test curre will be printed. Press "PRINT" , and "Print" will appear on the screen, then test curve will be printed synchronously. The picture on left is a sample.

Print Sample



Picture 7

Print Sample



Picture 8

2. When RS-232 port output is set at Pr.2, it is exported to micro printer and stored ten groups data will be printed. Press "PRINT", then "Print" flickers, and test report will be printed synchronously. The picture on right is a sample.
3. When port output mode is PC, you can view force curve by software or input 10 groups of stored data to computer by connecting computer. Specific operation is as follow :

Operation Process

1. Fix the meter on working stable to ensure that the working stable won't be moved when doing maximum test.
2. Normally, the torque value should be zero when you turn on the meter. If the torque value isn't zero, please press "ZERO" to clean the torque value.
3. Please choose the torque unit according to test requirement.
4. Set upper and lower limit deviation values, automatic power-off time, peak hold automatic discharge time, 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 hold 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.
   Press "SET" for the seventh time, the instrument will save all changed settings and be back to working condition.
   Note: During setting, pressing "ZERO" can save setting and be back to test condition.
5. After using torque meter, please turn off it and put it back into instrument box.

status; when it displays "AUTO PEAK" , the peak is in automatic discharge 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.

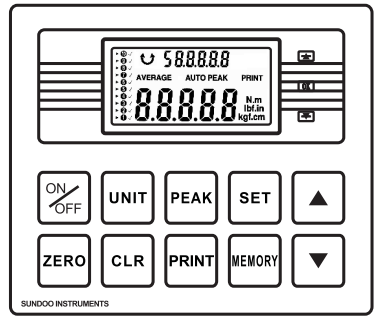
⑦ Stored torque value
" ❶❷❸❹❺❻❼❽❾❿ " ten cells, each cell can save one torque value.
" ► " shows that it is current stored reading location.
" √ "shows that the location has already stored torque value.

⑧ Average indication of stored torque data.

2. 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 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.

3. Function buttons



Picture 5

ON/OFF Power ON / OFF

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

UNIT Unit Button
→ N.m → kgf.cm → lbf.in →

CLEAR Clear Button
Under working status, pressing "CLEAR" can delete the datum in the cell which " ▶ " points at; pressing "CLEAR" all the time can delete all stored data.

PEAK Peak Button
Converting three status: Peak hold, peak hold automatic discharge and real-time tracking of the load. Real-time tracking of the load is default status after power on.

PRINT Print Button
Print the data of current status (View details on Page 9).

MEMORY Memory Button
Be used for saving test value and calculating the average of stored data. Test value on LCD screen can be stored into the meter by pressing "MEMORY" , Press the button all the time and the LCD screen will display "AVERAGE", thus you could view average of all stored value.

SET Set Button
A. Set upper and lower limit automatic alarm values.
B. Set automatic shutdown time (free setting from1~60minutes, 0 is not automatic shutdown).
C. Set peak hold automatic discharge time (free setting from 1~30 seconds).
D. Set RS-232C port output mode.
E. Set ON/OFF status of screen backlight.

▲ Add Button
A. Under storing test value status , press "▲", and "▸ "symbol will forward one location. Pressing "MEMORY" can store test value on 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. 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. Pressing "MEMORY" can store test value on LCD screen. If you press it all the time, the data will decrease continuously.

4. Micro Printer: Print 10 group of test data to judge max, min, average, qualified and unqualified value.
5. Printer Switch.
6. Power Socket.
7. RS-232 Port
   RS-232 port output, be used for connecting computer , printer and other outer equipments.
8. Sensor Interface
9. Fuse Box: Inside fuse is used for protect the meter owing to overload current.