Sauter GmbH
Tieringerstr. 11-15
D-72336 Balingen
E-Mail: info@sauter.eu

Tel: +49-[0]7433- 9976-174
Fax: +49-[0]7433-9976-285
Internet: www. sauter.eu

Instruction Manual
ST 1-20

DIGITAL TORQUE TESTER

Model: ST-1, ST-2, ST-5, ST-10, ST-20

Thank you very much for buying a SAUTER Torque Tester series ST. We hope that you are pleased with your instrument of high quality and its big functional range. Before the first use, please read this instruction manual carefully in order to take full advantage of this device. So the tests can be performed in a correct way.
If you have any queries, wishes or helpful suggestions, do not hesitate to call our service number.

Table of contents

1. Specifications- see catalogue…

Model	ST 1	ST 2	ST 5	ST 10	ST 20
Capacity	1Nm	2N.m	5N.m	10N.m	20N.m
Resolution	0,0005 N.m	0,001 N.m	0,002 N.m	0,005 N.m	0,01 N.m

Power supply: 8,4V 1,2V x 7 Ni-hy cells

Recharge time: about 4 hours

Charging time: about 40 hours

Battery life: about 3 months

Power adapter: Input: AC 220V 50 Hz/
Output: DC 12V 300 mA

Dimensions: 123 mm x 230 mm x 65 mm

Test frequency: 2000 Hz

Max. rotation speed: 2000 rpm

Accuracy: ± 0.5%

Weight: about 2.4 kg

2. Functions

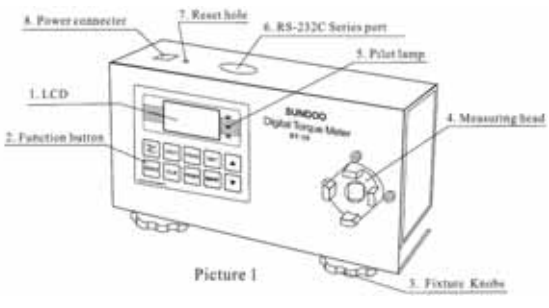
ST series of digital Torque Testers is an instrument especially designed for various torque testing and measuring. It is ideal for detecting and calibrating various electric & pneumatic screwdrivers (rotation speed < 2000 rpm) torque screwdriver, torque driver and wrench with torque control. Applied for the relative torsion torque testing and the torsion fracture parts testing. It features high accuracy, is easy to operate and handy to carry.
It is widely used in electric, machinery manufacture, scientific research etc.

3. Main Characteristics

1. High accuracy and high resolution
2. Upper and lower tolerance limit enables the device to judge the measured result as Go (green pilot lamp) / NG (red pilot lamp).
3. Torque direction display
4. Blue background light
5. Storage and printing 10 groups of test values
6. Real-time printing single time tested curve
7. Auto calculating the average of memory data
8. Automatical conversion in three units (N.m, kgf.cm, ibf.in).
9. Peak- holding, auto- releasing and setting and setting the peak clear time.
10. Auto Power Off and Setting time
11. Port (RS-232C) output, connection of PC with matched software.

4. Parts and their Functions

Picture 1



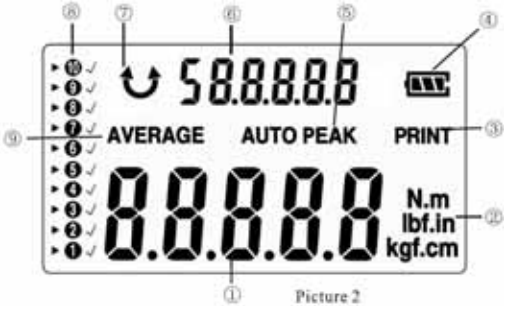
Picture 1

Sauter GmbH
Tieringerstr. 11-15
D-72336 Balingen
E-Mail: info@sauter.eu
Tel: +49-[0]7433- 9976-174
Fax: +49-[0]7433-9976-285
Internet: www. sauter.eu

Instruction Manual
ST 1-20

1. LCD

Picture 2:

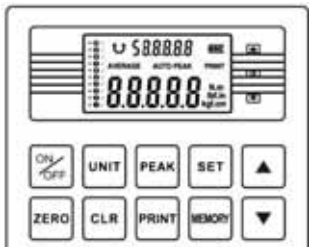


Picture 2

1. The value of torque; in Setting mode, the data is the set value.
2. Unit: 3 units (N.m, kgf.cm, ibf.in) and automatical conversion.
3. Print the memorized data or single tested curve
4. Indication of electrical power:
   When the capacity runs out, will appear. If it Starts flickering, the instrument has to be charged.
   After charging, the symbol will be shown.
5. Indication of Peak mode, “Peak” means the max. Torque value, “Auto Peak” means: the peak value will be cleared after the set time.
6. Indication of auto calculating the average of memorized data and the function symbol in Set mode, symbol of torque direction.
7. Clockwise direction , counter clockwise direction .
8. Memory data:
   " ❶❷❸❹❺❻❼❽❾❿ " are grids, one torque data is stored in one grid.
   ▶: means the value in the grid can be shown
   √ : the grid has stored the data

2. Function button

Picture 3:



ON/OFF Power on/ Power off

ZERO Zero button: cleans to zero and cleans peak value, or holding set value in Setting mode.

UNIT → N.m → kgf.cm → lbf.in
Shift button of units

CLEAR Clear button:
In the state of memorizing torque values this button Has to be pressed to delete the data at which " ▶ "points at. If CLEAR is pressed all the time, all the stored testing data will be deleted.

PEAK Peak button:
This button is the switch of Peak mode peak hold, Semi-peak hold and track. Track mode is default When the instrument is powered on.

PRINT Print button:
All the stored data can be printed out by pressing this button (output to PC serial port).

MEMORY Memory button:
With this button test values can be stored and the Average value can be calculated. By pressing this button continuously, the test value is shown on the screen of the device. Keeping the button pressed, “AVERAGE” will be displayed, which means that the calculated average of all reserved values is shown.

SET Setting:
1. Upper and lower tolerance limit
2. Peak hold and auto-releasing function (1-30 sec)
3. Automatic Power off and its time (1-60 min.)
4. RS-232C port output
5. Background illumination

▲ Arrow key **up**:
1. In Memory mode, by pressing this button once, The symbol will forward one case. If on the right of the case appears" √ ", it means that this case has already saved the tested value; the next tested value will take place of this value and will be saved in this case.
2. In Setting mode, the " SET "button has to be pressed and the set value will increase. At the key data it will straight increase.

▼ Arrow key **down**:
1. In Memory mode, by pressing this button once, the symbol will backward one case. If on the right of the case appears" √ ", it means that this case has already saved the tested value; the next tested value will take place of this value and will be saved in this case.
2. In Setting mode, the " SET "button has to be pressed and the set value will be reduced. At the key data it will straight decline.

3. Fixture knobs
They are used to fix the instrument on the test stand.
4. Measuring tips

Sauter GmbH
Tieringerstr. 11-15
D-72336 Balingen
E-Mail: info@sauter.eu
Tel: +49-[0]7433- 9976-174
Fax: +49-[0]7433-9976-285
Internet: www. sauter.eu

Instruction Manual
ST 1-20

They can be combined with clamps to transmit the torque load to the sensor.

5.Pilot lamp of upper and lower limit

means: upper limit alarm

means: normal, o.k.

means: lower limit alarm

The measured value should be within the preset value, Within the minimum range of deviation, then the normal indicator light will appear as , the value is qualified. When the measured value exceeds the upper limit, the symbol will appear and alarm to say that there is a measuring error. When the measured value is below the lower limit, the symbol will appear and alarm to say that there is a measuring error, that the measured value is not within the scope of the test results.

6. Communication port

RS-232C port, for connecting PC or printer with other equipment from outside.

7. Reset hole

It serves to restart the instrument if it is strongly disturbed.

8. Power connector

5. Working Environment

Temperature: 0°C up to 40°C
Humidity: 35% RH up to 65% RH (Relative Humidity)

No vibrancy and no cautery around!

6. Working Process

1.Before measurements are performed, it should be assured that the instrument is adequately charged. If not, the lower alarm symbol will appear on the LCD or the screen will be vague. Charging time is between 2 and 4 hours.
2. The Torque Tester has to be by the fixture knobs, if necessary.
3. Normally, the value is zero if the meter is on. If it isn't, the zero button has to be pressed to clean.
4. The unit button has to be pressed to choose the required unit.
5. The upper and lower tolerance limit can be set, the automatic power off time, the peak auto-release time, RS-232C output connection option and background illumination switch option. It has to be proceeded as follows:

By pressing the button the first time, the display shows "HIDT", the current frame stands for Automatic alarm limit. The buttons have to be pressed to change the current value.

By pressing the button the second time, the display shows "LODT", the number of the box shows the current lower limit of the automatic alarm. The buttons have to be pressed to change the current value.

By pressing the button the third time, the display shows "P.OFF", the number of the box shows the current self- moving off of the time. The buttons have to be pressed to change the current value.

By pressing the button the fourth time, the display shows "A.PE", the figures show the peak box automatically the lifting of time. The buttons have to be pressed to change the current value.

By pressing the button the fifth time, the display shows "RS-232", the figures show the PC box or Pr,PT, according to the buttons to change the current status.

By pressing the button the sixth time, the display shows "LIGHT", the figures show box "ON" or "OFF". "ON" means that the backlight is on, "OFF" means that the backlight is off. The buttons have to be pressed to change the current status.
6. A proper buffer has to be chosen and it has to be fixed on the Torque Tester.
7. To measure the torque of other twisting tools or objects, other suitable adapters have to be chosen, for the installation dimension please refer to picture 5.
8. To print the tested curve or reserved torque value the equipped line has to be used to connect to the micro-printer.
9. After the measurements the buffer or adapter has to be taken off first, then the instrument has to be turned off.
It has to be put back into its toolbox to be preserved safely.

Note: In the process of setting , the "home" button has to be pressed to save the settings of to return to the test state.

7. Test Process of Screwdriver Torque

1. The buffer has to be fixed on the torque measuring tip. Then the screwdriver has to be installed on the buffer.

Picture 4:

Sauter GmbH
Tieringerstr. 11-15
D-72336 Balingen
E-Mail: info@sauter.eu
Tel: +49-[0]7433- 9976-174
Fax: +49-[0]7433-9976-285
Internet: www. sauter.eu

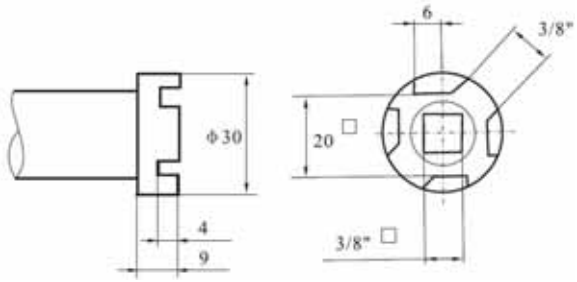
Instruction Manual
ST 1-20

2. The screwdriver has to be switched to REV, it has to be wrenched by hand counter clockwise; then the spring of the buffer has to be unfastened a little.
3. The Peak button has to be pressed and peak holding has to be chosen.
4. The Zero button has to be pressed and the torque value on the LCD will be zero.
5. The screwdriver has to be switched to FOR and twisted until it stops by itself.
6. After the screwdriver stops rotating, the torque value on the LCD is the screwdriver's torque output.
Repeating the above steps 2. to 5., this torque output of the screwdriver can be confirmed by another measurement. To meet the requirements, the torque nut can be adjusted, either loosening or fastening it.

8. Measuring Tip and its connecting Dimensions

In the following illustration the horizontal dimension of the torque measuring tip is shown:

Picture 5:



The buffer has to be installed properly on the torque measuring tip.
The vertical load of the measuring tip should not exceed 10 kg.
Collision of the torque measuring tip with other objects should be avoided to prevent any damage.

9. Buffer's Test Range, Installation and Inspection
Buffer's test range

Model	Accessories
ST-1 ST-2 ST-5 ST-10 ST-20	Assembly, Connection bearing, Small spring

2. Buffer's Installation

a) In compliance with the requirements of the test, a suitable connecting axis and spring should be chosen to equip the buffer's completely.
b) If there is no suitable connection shaft, the screwed hole above has to be used. The screw has to be screwed with a screw-nut into this hole.

3. Buffer's inspection

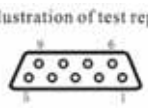
Picture 6:

a) The buffer has to be checked before starting to work. The accuracy will be affected if there is dust, oil lack or bending of the connecting axis.
b) The bearing of the buffer has to be checked regularly. A long time, repetitive use leads to attrition of the bearing and the buffer won't rotate smoothly any longer. This will influence the torque value in a negative way.
c) After the connecting axis has revolved out, it has to be twisted for more than 2mm to avoid a damage of the connecting axis during the process of testing.

10. Port Output

The port output for RS-232C level should be supported by the external equipment likewise matching RS-232C level.
RS-232C data output is as follows:

Illustration of test report

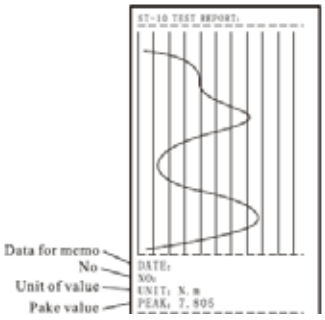


Needle	Signal	Illustration
2	TxD	output signal of SCM
3	RxD	reception signal SCM
5	GND	Signal place

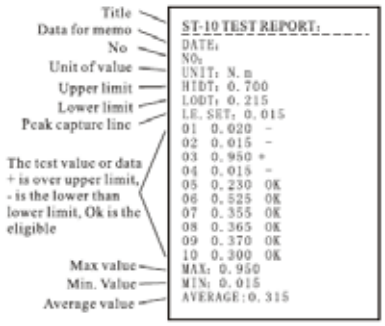
If RS-232C output is set at Pr.1, the single tested curve will be printed (picture 7)

If PRINT is being pressed and appears on the screen, the printed curve will be printed simultaneously during the process of testing (picture 8)

Picture 7:



Picture 8:



If RS-232C output is set at Pr.2, the screen will flicker when PRINT is being pressed and ten groups of data and analysis report will be printed (please refer to picture 8).

If RS-232C output is set at PC, the screen will flicker and when PRINT is being pressed and ten groups of data will be transmitted to the PC.

13. Declaration of Conformity

SAUTER

SAUTER GmbH
D-72458 Albstadt
E-Mail: info@sauter.eu
Tel: 0049-[0]7431- 938-666
Fax: 0049-[0]7431-938-292
Internet: www.sauter.eu

Konformitätserklärung

Declaration of conformity for apparatus with CE mark
Konformitätserklärung für Geräte mit CE-Zeichen
Déclaration de conformité pour appareils portant la marque CE
Declaración de conformidad para aparatos con marca CE
Dichiarazione di conformità per apparecchi contrassegnati con la marcatura CE

English We hereby declare that the product to which this declaration refers conforms with the following standards.

Deutsch Wir erklären hiermit, dass das Produkt, auf das sich diese Erklärung bezieht, mit den nachstehenden Normen übereinstimmt.

Français Nous déclarons avec cela responsabilité que le produit, auquel se rapporte la présente déclaration, est conforme aux normes citées ci-après.

Español Manifestamos en la presente que el producto al que se refiere esta declaración est¨a de acuerdo con las normas siguientes

Italiano Dichiariamo con ciò che il prodotto al quale la presente dichiarazione si riferisce è conforme alle norme di seguito citate.

Digital Torque Gauge: SAUTER ST

Mark applied	EU Directives	Standards
	89/336/EEC ;92/31/ EC; 93/68/EEC ; 2004/108/EC	EN 61326-1 :1997

Date: 07.01.2009 **Signature:**

SAUTER GmbH
Management

SAUTER GmbH, Schmiechastr. 147-151, D-72458 Albstadt, Tel: +49 (0) 7431 938 666, Fax: +49 (0)7431 938292