English

User Manual

LTB Series Bottle Cap Tester

Warning!

Do not use LTB series torque testers with overload

Last change:10 March 2023
V1.1

THANK YOU...

Many thanks for purchasing LBT series digital cap torque tester from LIWIT company, that designs and produces force and torque measurement instruments professionally.

With measuring range up to 20N.m and 0.3%FS high accuracy, LBT series digital cap torque tester is designed to measure the torque of opening and closing the bottle cap.

With proper usage, we are very sure that you will get many years of good performance with this product. LBT series digital cap torque tester is ruggedly built for both lab and industrial environment.

The User's Guide provides setup, safety and operation instructions. Dimensions and specifications are also included. For additional inquiry or answers to your questions, please don't hesitate to contact us. We are very willing and eager to help you, and provide lifelong technical support.

Before the first use, please read the User's Manual very carefully for right operation and safety procedures.

Contents

1 OVERVIEW

1.1 List of included items

1 x LTB-2/5/10/20 digital cap torque tester
1 x USB cable
1 x power cable
1 x software CD with manual
1 x sample gripping posts
1 x 5mm inner hexagon spanner
1 x user manual
1 x factory inspection factory

1.2 Safety notes/right use

Caution!
Note the capacity of the tester before using and make sure that the capacity is not exceeded. Overload(torque greater than the tester's capacity) can damage the internal load cell. An overload can occur whether the tester is powered on or off and "OVER" occur in the display. The tester is designed mainly for the testing of torque tools, although other items can be tested as well. Items that should not be used with the tester include potentially flammable substances or products, items that can shatter in an unsafe manner, and any other components that can present an exceedingly hazardous situation when acted upon by a load.

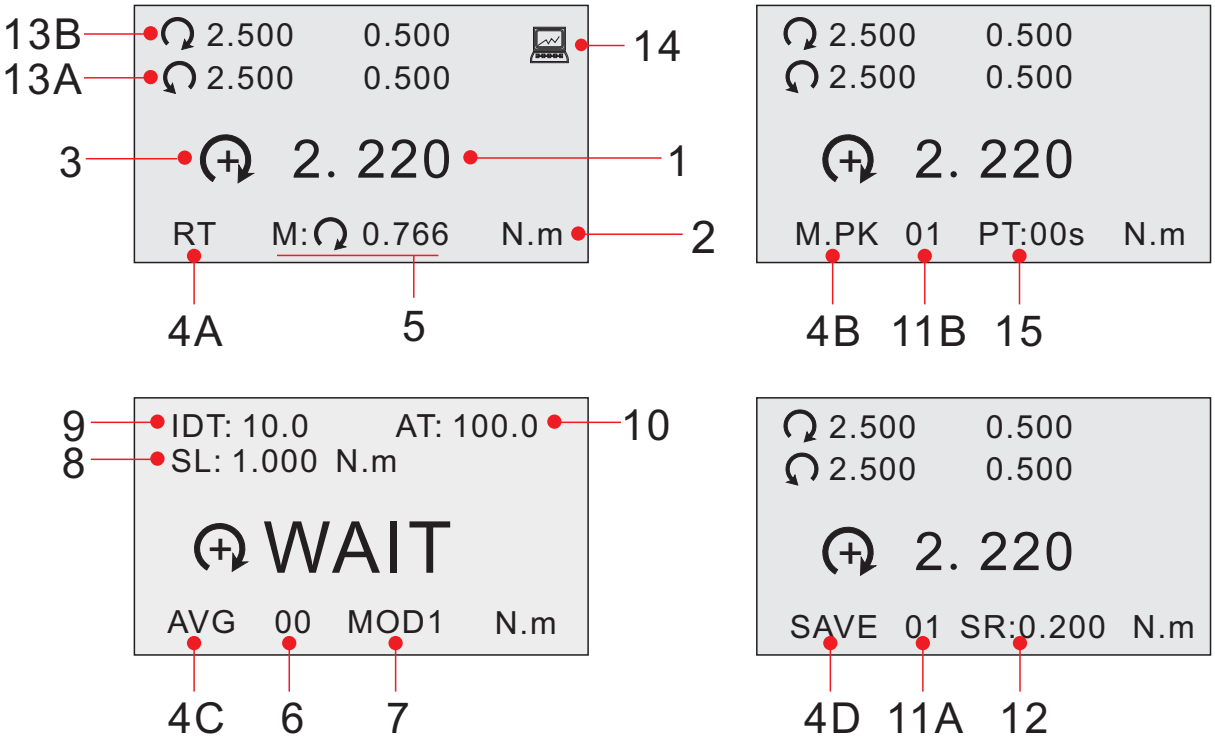
The following safety checks is necessary before and during operation:
1. Don't use the tester if there is any visible damage to the tester itself.
2. Don't use the tester near water or any other electrically conductive liquids at all times.
3. Before the housing is opened, AC power must be disconnected and the tester must be powered off.
4. Don't use other chargers or battery to replace the supplied otherwise it may cause short circuit and damage the tester, even fire.
5. Wear glove and face protection mask while testing, especially while testing brittle samples that have the potential to shatter under force.
6. In certain applications, such as the testing of brittle samples that can shatter, or other applications that may lead to a dangerous situation, it is strongly recommended that a guarding system should be used to protect the operator and others.
7. When the tester is not in use, turn off and put it into the right place.

2 PARTS AND SPECIFICATION

Model	Measurement range	Resolution
LTB-2	0...2 N.m	0.001 N.m
LTB-5	0...5 N.m	0.002 N.m
LTB-10	0...10 N.m	0.005 N.m
LTB-20	0...20 N.m	0.01 N.m
Accuracy	0.3% full scale	
Units	N.m, kgF.cm, lbF.in	
Power	110-230V AC power	
Sample size	Φ20-200 mm	
Weight(without package)	about 9 kgs	
Environmental requirements	Work temperature: 5℃-45℃, Relative humidity:35%-65%HR	

3 HOME SCREEN AND KEY CONTROLS

3.1 Home screen for 4 modes



No.	Name	Description
1	Primary reading	The current displayed torque reading. see **Measurement modes** for details.
2	Units	The current unit. Abbreviations are as follows: N.m-Newton.meter N.cm-Newton.centimeter kgF.cm-Kilogram.centimeter lbF.in-Pound.inch
3	Measurement direction indicator	-indicates clockwise direction -indicates counter-clockwise direction

4A 4B 4C 4D	Modes	The current mesurement mode, Abbreviation are as follows: RT-Real Time Peak(M.PK & A.PK) AVG SAVE See **Measurement modes** for details about each of modes
5	Memory value	The maximum value of last measurement in RT mode
6	Number of stored data points	The number of stored data points in memory in AVG mode, up to 10
7	Average mode	Two measurement ways: MOD1 and MOD2 in AVG mode. See the **Operation modes** for details
8	Trigger torque	The minimum torque required to start the averaging sequence in AVG mode
9	Initial delay	The time delay, after the trigger torque, before the averaging sequence commences
10	Averaging time	The time duration of the averaging sequence
11A 11B	Number of stored data points	The number of stored data points in memory in SAVE & PK modes 50 data can be saved separately for both modes.
12	Trigger torque peak	The minimum torque peak required to save in SAVE mode
13A 13B	Set points	The programmed torque limit values. See **Upper and lower limit** for details
14	PC communication indicator	Display the successful communication to PC software
15	Peak Time	Peak retention time, see other setting for more details

3.2 Key controls

Key	Functions description
	Powers the tester on and off. Press briefly to power on and off
	Press to enter the setting screen in the home screen Confirm the selected item
	Press briefly to toggle between clockwise and anticlockwise high/low limit in the home screen Select the setting item in the setting screen Toggles among pages in the saved data screen
	Toggles between measurement units in the home screen Increase setting parameter in the setting screen Select the memory value upward in the saved data screen
	Press to enter data menu in the home screen Decrease setting parameter in the setting screen Select the memory value downward in the saved data screen
	Toggles between measurement modes in the home screen Delete single memory value in the saved data screen
	Zero the peak reading in the home screen Escape the current screen

4 OPERATING MODES

Caution!
In any operating mode, if the capacity of the gauge has been exceeded, the display will show "OVER" to indicate an overload. A continuous audible tone will be sounded until the load has been reduced to a safe level(under capacity).

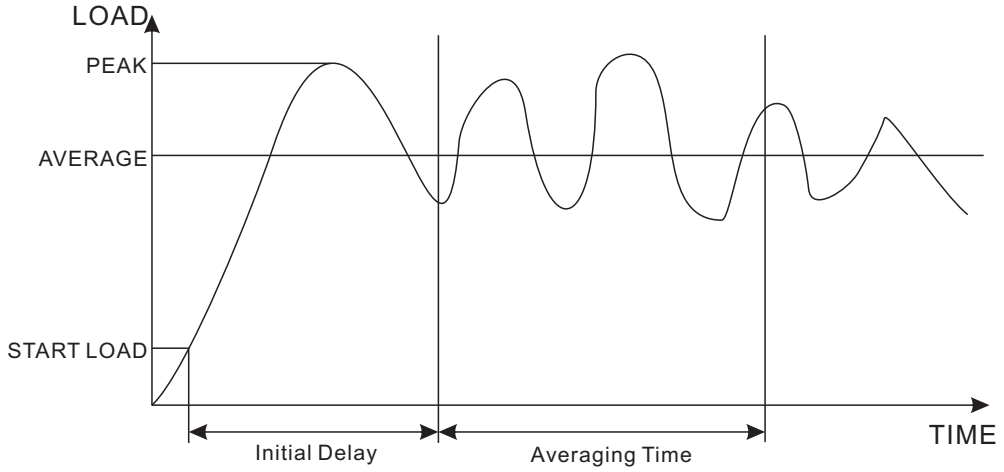
Four operating modes are available with LBT series digital cap torque tester. To cycle between the modes by pressing **MODE** key in the home screen.

4.1 Real Time (RT)
The reading depends on the live measured reading.

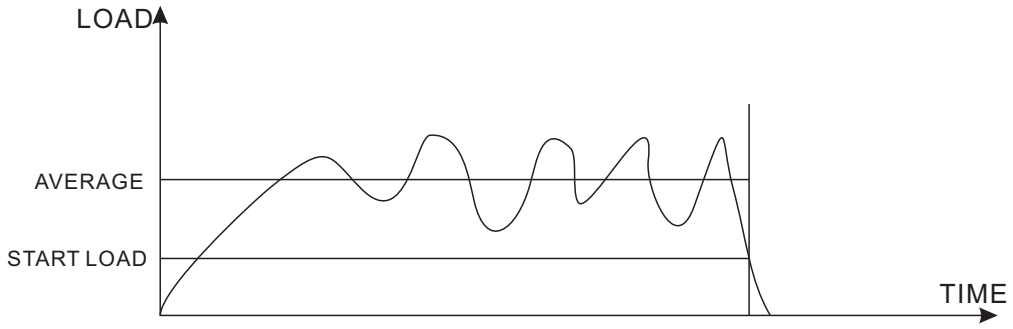
4.2 Peak (M.PK & A.PK)
The reading depends on the maximum clockwise/anticlockwise reading observed. If the actual load greater than the peak record(it can be set, see other setting for more details), the max. value will still be remained in the reading area of the display. When the mode is selected, the number of saved data point (01-50) will appear on the right of M.PK/A.PK. It can store 50 max. data in total. After saving the current max. data, the record number will increment for next memory. If the record number has the previous saved data, the new data will replace previous data.

	Description
A.PK	Zero the max. value automatically according to Peak Time, Peak Time is can be set from 01-10 seconds in the setting menu. When Peak Time is 01-10 seconds, A.PK will be showed in the PK mode of home screen.
M.PK	Zero the Max. value by pressing ZERO key, the value will be stored at the same time. When the Peak Time is 00 seconds, M.PK will be showed in the PK mode of home screen.

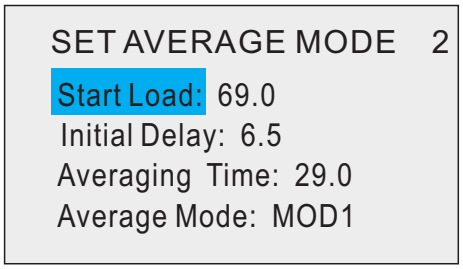
4.3 Average mode (AVG)
Average mode is used to get an average torque over time. LBT series digital cap torque tester can save 10 data (circle from 00 to 09). If the **AVG** mode is selected by pressing **MODE** key, the number of stored data point will appear on the right of **AVG** in the home screen. Every time, finish one test and the reading will be saved to the displayed record number automatically, then the record number will increment each time. If the record number has the previous saved data, the new reading will replace the previous data. The averaging function operates in one of two ways: MOD1 and MOD2.
MOD1: Averaging occurs between the minimum capture torque and defined time limit.



MOD2:Averaging occurs only while above the minimum capture torque. As the load drops back down to this minimum capture torque, averaging stops. Total time is 10 minutes for **MOD2**.The averaging continue above the minimum capture torque, unless the 10 minutes limit is reached.



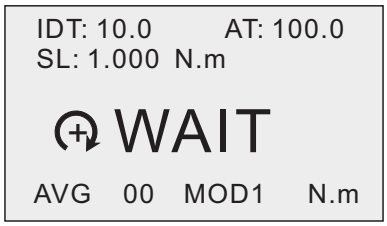
To enable the measurement mode. Press the **SET** key twice in the home screen to enter the setting screen of Set Average Mode. See the picture below:

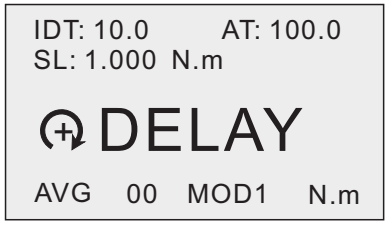


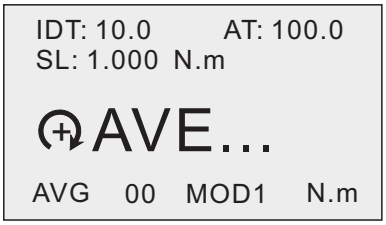
Note: select the one of them by pressing **SELECT** key and change the parameter by pressing ▲/▼ key.

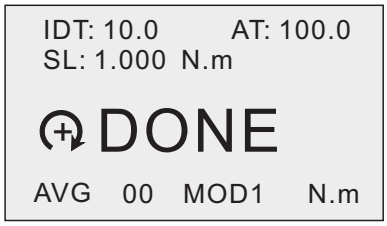
Start Load	The minimum torque required to start the averaging sequence. The load may be configured from 0 to full scale.
Initial Delay	The time delay, after the start load, before the averaging sequence commences. Available setting:0.0 -300.0 sec., in 0.1 sec. Increments. Applied only for MOD1.
Averaging Time	The time duration of the averaging sequence. Available settings: 0.1-300.0 sec., in 0.1 sec. Increments. Applied only for MOD1.
Average Mode	Two ways (MOD1 or MOD2) to calculate the average.

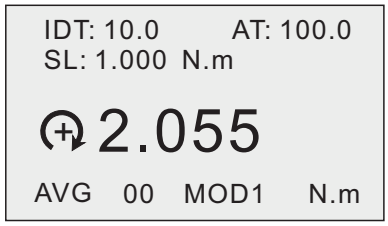
After the parameters have been configured and press I← key to save and back to the home screen, press **MODE** key until AVG is displayed. The averaging sequence will commence when the start load has occurred. The current status of the averaging sequence is displayed below. After finishing test, press **ZERO** key to reset and for next test.











IDT: Initial Delay Time AT: Averaging Time SL: Start Load

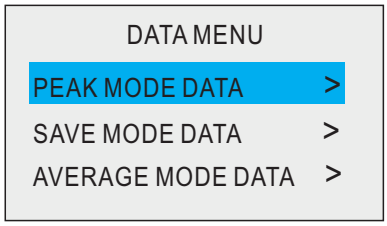
WAIT	The start load has not reached
DELAY	The initial delay is currently taking place.
AVE...	The tester is collecting readings until the time is over
DONE	Averaging has been completed. The average load is displayed

4.4 SAVE mode

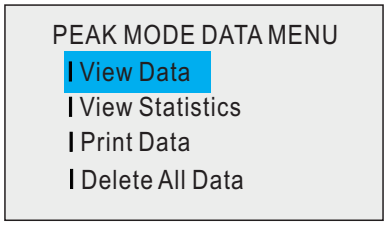
SAVE mode could save the max. measuring value automatically in a single test. LBT series digital cap torque tester have storage capacity of 50 data (circle from 01 to 50). If the **SAVE** mode is selected by pressing **MODE** key, the number of stored data point will appear on the right of **SAVE** in the home screen. Every time, finish one test and the reading will be saved to the displayed record number automatically, then the record number will increment each time. If the record number has the previous saved data, the new reading will replace the previous data.

5 DATA MEMORY AND STATISTICS

LTB series testers can save 50 data separately in **Peak /Save** mode and 10 data in **AVG** mode. Readings may be stored, viewed, and output to an external device. Individual, or all, data may be deleted. Statistics are calculated for the data presently in memory.
To view/delete/output saved readings and statistics, press **DATA** key to enter the **Data Menu** screen below.



Select one item of them you want to check by pressing **SELECT** key and press ↵ key enter **PEAK MODE DATA MENU**.



5.1 View data

All the saved data points may be viewed. Press **SELECT** key to mark it, then press ↵ key to enter. the screen appears as follows below.

The record number is displayed, along with the corresponding value and presently set unit of measurement. Any readings may be deleted individually. To do so, press ▲/▼ key to move the icon > to the desired reading and press ✘ key to delete the value.

```
>01=↻2.200  02=↻2.205
 03=↻2.215  04=↻2.225
 05=↻2.205  06=↻2.215
 07=↻2.220  08=↻2.235
 09=↻2.240  10=↻2.250
   N.m      Page 01 Total /05
```

5.2 View statistics.

Statistical calculations are performed for the saved values. Calculations include number of readings, minimum, maximum, mean.

Press **SELECT** key to mark it, then press ↵ key to enter, the screen appears as follows below.

```
        DATA STATISTICS
Max. Load: 2. 500      N. m
Min. Load: 1. 200      N. m
Ave. Load: 2. 200      N. m
Data Total:  20
```

5.3 Print data

The testers has micro printer inside and the saved data may be printed. Press **SELECT** key to mark it, and press ↵ key to print, then display **DATA SENT**. Saved data can be download by some LIWIT data collection programs. See the **Data communication and output** for details.

Print Sample

```
LTB-5 Digital Torqu Tool Tester
Company:
Date:
Unit:  N.m
P00=+0.903  P01=+0.805
P02=+0.704  P03=+0.803
P04=+0.962  P05=+0.976
P06=+1.001  P07=+1.003
P08=+1.004  P09=+1.005
P10=+0.996  P11=+0.993
P12=+0.997  P13=+0.998
P14=+1.002  P15=+0.997
P16=+0.997  P17=+0.805
P18=+0.996  P19=+0.999

Max.:1. 005
Min.:0.703
Mean:0.947
Total Data:20
```

5.4 Clear all data

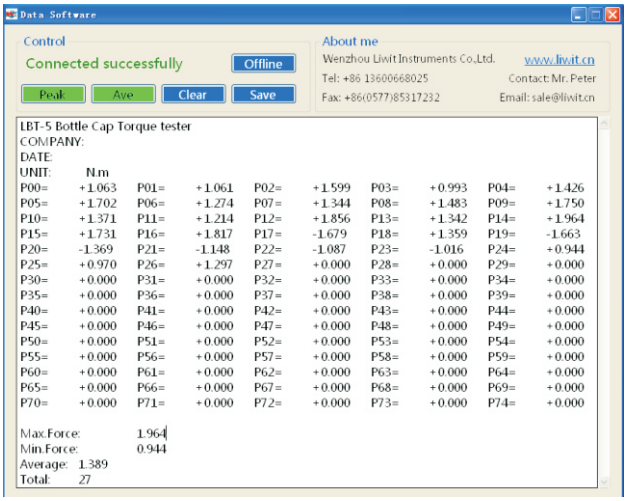
Press **SELECT** key to mark it, then press ↵ key to clear all data from the memory.

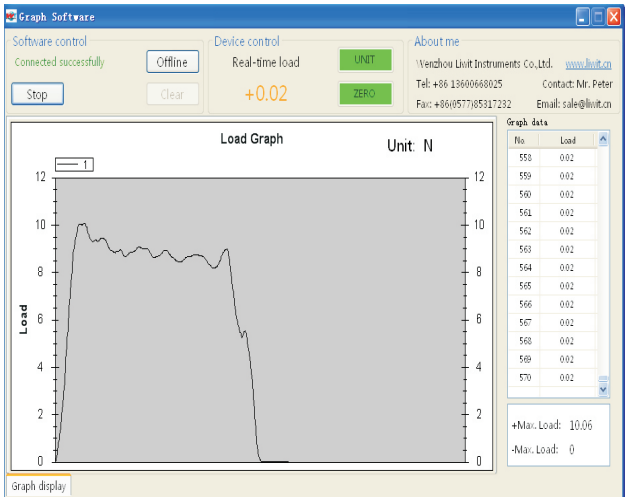
6 COMMUNICATION AND OUTPUT

Communication with LTB series digital cap torque tester is achieved through USB port, as shown in the **Power Section**.

The tester can communicate to computer through USB port. Communication is possible only when the tester is in the home screen. Saved data can be downloaded by some LIWIT Data Collection Program. Analysis Software is also provided for the tester. Analysis Software will collect data from the tester, calculates statistics, also export data to Excel.

For more details and operation of data collection program and analysis software, see the manual in the LIWIT Measurement CD.





7 UPPER AND LOWER LIMIT

Upper and lower limits are useful for tolerance checking (pass/fail) with indicator lamp of three different colors in special applications. Two limits, high and low, are configured in the tester and the measuring reading is compared to the two limits. If the measuring reading is less than lower limit, the indicator lamp will display two colours (green and red).If the measuring reading is in the middle of lower limit and upper limit, it will display green. If the measuring read is greater than upper limit, it will display red. The function can be used for any measurement mode.

To configure the limits, press **SET** key once in the home screen to enter the following screen below.

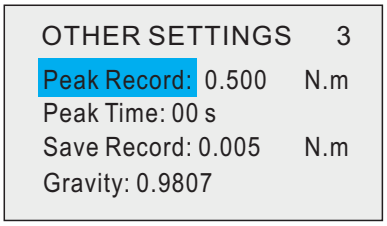
SET PIONTS	1
H. Limit: 2.500	N.m
L. Limit: 0.500	N.m
H. Limit: 2.500	N.m
L. Limit: 0.500	N.m

↻ H. Limit	Clockwise Upper Limit Value. Press **SELECT** key to mark the parameter and press ▲/▼ to increase/decrease.The parameter setting range is from lower limit to full scale.
↻ L. Limit	Clockwise Lower Limit Value. Press **SELECT** key to mark the parameter and press ▲/▼ to increase/decrease.The parameter setting range is from zero to upper limit.
↺ H. Limit	Anticlockwise Upper Limit Value. Press **SELECT** key to mark the parameter and press ▲/▼ to increase/decrease.The parameter setting range is from lower limit to full scale.
↺ L. Limit	Anticlockwise Lower Limit Value. Press **SELECT** key to select the parameter and press ▲/▼ to increase/decrease.The parameter setting range is from zero to upper limit.

Notice: upper limit value must be greater than lower limit value

8 Other settings

To access the other settings, press **SET** key three times in the home screen to enter the "**Other Settings**". Select the setting item by pressing **SELECT** key and change the parameter by pressing ▲/▼key. After finishing the settings, press **SET** key or ⏎ key to save and be back the home screen.



8.1 Peak Record

In Peak mode (M.PK & A. PK), the reading is less than peak record, it will not display in the home screen. It can be set from 0 to capacity.

8.2 Peak Time

In Peak mode(M.PK & A.PK), the peak can be zero manually or automatically. The 00 is M.PK, the reading must be zero pressing zero key. The 01-10 is A.PK, the reading can be zero according to the setting time.

8.3 Save Record

Save record is minimum saved torque in the SAVE mode. If the reading is less than save record, it won't store in a single test. It can be set from 0 to capacity.

8.4 Gravity

The tester is calibrated in this Gravity.

Note:

The tester may be configured to automatically power off for a period of inactivity time. Inactivity means no operation for any keys or load changes.

Dear customers/users:

The description in the User's Guide depends on the latest products. We still improve our products, so forgive us not to tell the place of modifications for all customers. Here, we are very thankful for your understanding and support.

We strive to accomplish 100% customer satisfaction through high-quality products and good service. Based on our standard products, we can provide product modifications for your OEM applications, including shape design, functions change, etc. Our technical team is eager to satisfy any custom requirement. Please contact us for more information and suggestions.

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