

HIMAX

TORQUE METER

RT-10 / RT-100



TORQUE METER OPERATION MANUAL

Before use, please read this operation manual in details.

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Product Features

In line with stricter quality control standards, this product can be applied to meet all the strict requirements in precision torque measurement and adjustment.

HIMAX TORQUE METER

Specially designed to accurately measure the output torque of small torque tools at an applicable range of (0.10~100.0Kgf-cm), with the hope of effectively managing all the torque tools available on the production lines, achieving consistently standardized output, boosting production efficiency, reducing the defect rate, and creating the cost benefits of high quality and low loss.

This product can accommodate to different user's needs and can be used together with user-designed tools to measure the supporting torque of LCD panel hinges of notebook computers and mobile phones, the rebounding force of rear-view mirrors of cars, and so on.

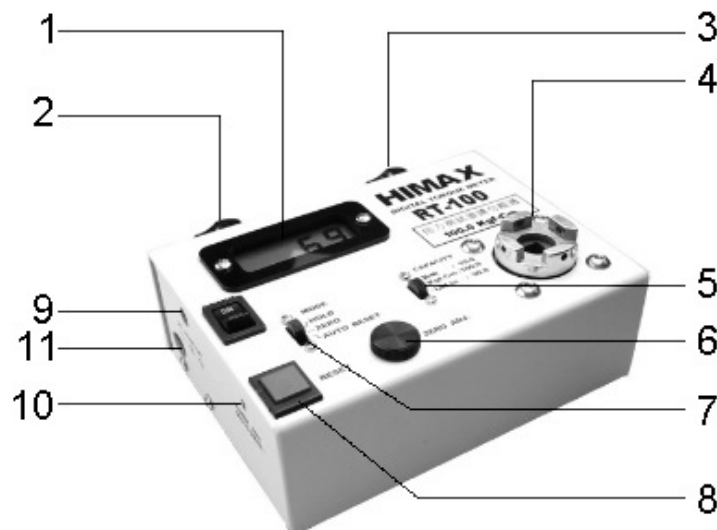
Product Features

- Capable of displaying the torque measurements in LCD digital display for easy reading and judgment.
- Comprising an automatic reset timer-control device for easy operations.
- Obtaining precision torque measurements within an applicable range of $\pm 0.5\%$.
- Obtaining precision torque measurements both in clockwise and counter-clockwise direction.
- Powered by a rechargeable battery, compact, light, and highly portable.
- Made in a power-saving and durable automatic power shutdown circuit design.
- Capable of switching between the Metric and British system.



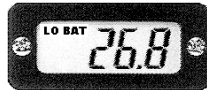
Illustrations of Functions

1. 【 Display Panel 】
2. 【 Power 】
3. 【 Fixture Clamp 】
During measurement, please fix the Torque Meter on the worktable by this fixture clamp.
4. 【 Balance Socket 】
For installing additional gauges to measure torque.
5. 【 Capacity / Unit Converter 】
Capable of switching between the S.I. system / metric system and the British system (i.e. N.m \longleftrightarrow Kgf-cm \longleftrightarrow Lbf-in)
6. 【 Zero Adjustment Knob 】
For adjusting the reading to zero.
7. 【 Operation Mode 】
 \triangle When the switch is in «HOLD» position, it is capable of retaining every reading.
 \triangle When the switch is in «ZERO» position, it is capable of tracking the display reading according to the size of loadings.
 \triangle When the switch is in «AUTO RESET» position, it is capable of automatically being reset to zero.
8. 【 Reset 】
Press this key to reset the readings on the LCD display to zero.
9. 【 DC Adaptor 】
10. 【 Auto Reset Timer Adjustment Knob 】
11. 【 RS234 Data Output Connector 】



Operation Instructions

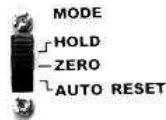
1. Please fix the Torque Meter on the worktable by the fixture clamp.
2. Turn on the power.
Before use, check if the Torque Meter has been fully recharged.



If “LO BAT” is displayed on the left upper corner, this means the power is not sufficient. Please use the recharger enclosed with this package to recharge the Torque Meter.

3. Before use, first check if the reading on the display panel has been reset to zero, and complete the accurate zero-resetting procedures according to the following steps:

- Set the [MODE] to «ZERO» position.



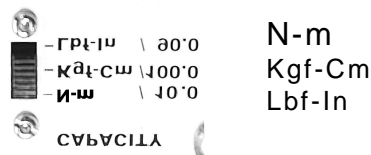
- Press the [RESET] button to reset the reading to zero.
- If the reading on the display panel cannot be reset to zero with the above procedures, turn the [ZERO ADJUSTMENT KNOB] leftward and rightward slightly, until the reading on the display panel becomes 0.00



(however, the zero value in the RT-10 model is shown as “0.0.”)

- Now the zero-resetting settings are completed.

4. Select the measurement unit by the [Capacity / Unit Converter]
N.m ↔ Kgf-cm ↔ Lbf-in unit conversion



5. While using an electric screwdriver or a pneumatic screwdriver, please use the specially designed Fidaptor enclosed with this package.



Operation Instructions

6. Three operation modes are made available in this model for your selection:

Manual Zero-Resetting [MODE] in “HOLD” position

When the testing is completed, the test values will be retained on the display panel. Press the [REST] button once more to complete the zero-resetting procedure.

Zero-resetting Tracking [MODE] in “ZERO” position

The test values will track and display the corresponding values according to the size of the loaded torque applied on the to-be-used tool. When no torque is exerting on the torque meter, the reading resets to zero.

Auto Reset [MODE] in “AUTO RESET” position

The test values will automatically reset to zero after the display of the set time (0.5 sec.~ 30 sec.)

This mode is the most handy and practical for conducting multiple torque measurements of a single torque tool (such as an torque control type electric screwdriver.)

7. Auto Reset Timer Adjustment

Plug a small slot-head screwdriver into [TIMER ADJ.] at the side of the machine, and automatically adjust the readings to reset the timer according to the job requirements.

(For a time range of 0.5-30 sec., turn the knob in a clockwise direction to prolong the display time.)

8. After one torque measurement, accurately reset the reading to zero for the next measurement, so as to be able to obtain a precise reading.
9. Positive readings will all be displayed on the LCD display panel, whether they are measured in a clockwise or a counter-clockwise direction.

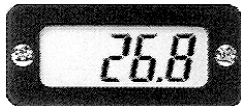
Notes

- During torque measurement, please don't exceed 110% of the applicable limit. Maximum Torque reading for the RT-100 Model (100.0Kgf-cm) / for the RT-10 (10.00Kgf-cm)
- Continuous recharging time is 15 hours. Please don't recharge the battery for more than 20 hours.
- Please don't place any heavy object on the LCD display panel.
- Please don't place the instrument in the following environment, so as to avoid any inaccurate torque measurement:
 - 《Locations at high temperature & high humidity》
Humidity : 35-85%; Temperature: 0-40°C
 - 《Locations on which there are vibrations or a lot of dusts》
 - 《Locations on which water, oil or other liquids will easily be spilled》
 - 《Outdoors or locations with electro-magnetic interference》
 - 《Locations that are capable of affecting normal operations or causing damages》
- During use, please regularly check if the reading has accurately been reset to zero.
- When the torque meter is not used, please don't open the outer case and touch any knob.
- Please don't loosen any screw on the instrument, so as to avoid inaccurate measurements.
- Please use the torque meter carefully and don't drop it to the floor; otherwise, this may easily cause the malfunctioning of parts.
- In case of a torque smaller than 5Kgf-cm, the yellow spring (at low Modulus of Elasticity) is required to be changed, so as to achieve a higher precision.
- This product is a precision gauge. In case of breakdown, please don't dismantle and repair the torque meter on your own; otherwise, this may cause more severe damages.

Product Specifications

Model No.	RT-100	RT-10
Measurement Range	0.1-100.0Kgf-cm	0.01-10.00Kgf-cm
	0.1-90.0Lbf-in	0.01-9.00Lbf-in
Accuracy	0.5%(F.S.)	
	20.0Kgf-cm	2.00Kgf-cm
	1 digit	
Power	1.2V Nicdcell 6Pcs.	
Recharging Time	Within 15 hours	
Continuous use at Full charge	20 hours	
Battery life	Rechargeable for 300 times	
Dimensions	150x110x50 mm	
Weight	1.8Kgs	

- For the RT-100 Model, capable of displaying readings at one digit after the decimal point.



- For the RT-10 Model, capable of displaying readings at two digits after the decimal point.






Product Descriptions of Accessories




1. One Torque Meter
2. One set of specially designed recharger at 110V ~ 230V
3. One damp-proof case specially designed for the torque meter
4. One Operation Manual
5. Certificate of Product Testing
6. One set of Fidaptor specially designed for the electric screwdriver (selected according to the accessories of the product model number)

RT-100 Standard Accessories				Product No. TFA100	
Fidaptor	Threaded Shafts			Torsion Springs	
	4mm	5mm	Hex	10Kgf-cm	30Kgf-cm
			 HEX 5.0 / 6.35mm		
	TFA5G	TFA-1-4	TFA-1-5	TFA-1-6	TFA-4-G

The accessories have already been assembled on the Fidaptor

RT-10 Standard Accessories		Product No. TFA10
Fidaptor	Threaded Shafts	Torsion Springs
	4mm	10Kgf-cm
		
	TFA5G	TFA-1-4






The accessories have already been assembled on the Fidaptor

RT-10 (Optional Accessories) For a light torque below 2.0Kgf-cm		Product No. TFB10
Fidaptor	Threaded Shafts	Torsion Springs
	4mm	2Kgf-cm
		
	TFB-3R	TFB-1-4

Notes for Using the Accessories

Accurate use of the accessory Fidaptor can achieve high precision readings.

1. The accessories Fidaptor are specially used to measure the torque of the torque control type electric screwdriver.
2. Please select the Fidaptor of accurate specifications according to the applicable range of torque measurement. Please don't exceed the maximum load.
3. When measuring torque, please apply the to-be-tested tools (ex. electric screwdriver) at a perpendicular position to the Fidaptor.
4. During continuous measurement, please apply lubricant on the Threaded shaft / lower base of the Fidaptor.
5. During continuous measurement, please use the Fidaptor at an interval of more than 5 seconds apart, so as to avoid the rapid loss of the tool.
6. When it is not in use, please loosen the torsion spring for proper storage under no exerted force.
7. This accessory Fidaptor is a consumable product. Please regularly check and change it according to the suggestions of the following Frequency of Serviceability.

Fidaptor Assembly	Suggested Usage
	Threaded Shaft Durable for: approximately 2,500 times The following losses may be caused for multiple uses: ◎Loss at the connecting ends of the measurement electric screwdriver ◎Loss at the threads of the shaft ◎Bending of the shaft subject to force
	Thrust Bearing Durable for: approximately 2,500 times
	Upper Base Durable for: approximately 5,000 times
	Torsion Spring Durable for: approximately 50,000 times
	Lower Base of the Tool Durable for: approximately 5,000 times

Quantitative Torque Testing Arm (Optional)



Capable of easily checking if the Torque Meter is kept at normal conditions
 The TCB100 model can measure a torque of 10.0Kgf-cm.
 The TCB10 model measure a torque of 1.00Kgf-cm.

RS232 Data Output

HIMAX Torque Meter Include RS-232 conformity

RS232 setting

Baud rate 9600bps

Data bit 8bits

Stop bit 1bit

Parity None

Connector specification (DB9)

pin 3 : data output / pin 5: GND



Data Format

ASCII 3~5 digits(Include the digit of decimal point) + CR+LF

- $\underbrace{10.00}_{\text{ASCII } 31+30+2E+30+30+0D+0A}$
- $\underbrace{1.15}_{\text{ASCII } 31+2E+31+35+0D+0A}$
- $\underbrace{0.1}_{\text{ASCII } 30+2E+31+0D+0A}$

Torque Unit Conversion Table

Unit	British System			Metric System			SI International System		
	ozf-in	lbf-in	lbf-ft	gf-cm	kgf-cm	kgf-m	mN-m	cN-m	N-m
1 ozf-in	1	0.0625	0.005	72	0.072	0.0007	7.062	0.706	0.007
1 lbf-in	16	1	0.083	1152.1	1.152	0.0115	113	11.3	0.113
1 lbf-ft	192	12	1	13826	13.83	0.138	1356	135.6	1.356
1 gf-cm	0.014	0.0009	0.00007	1	0.001	0.00001	0.098	0.01	0.0001
1 kgf-cm	13.89	0.868	0.072	1000	1	0.01	98.07	9.807	0.098
1 kgf-m	1389	86.8	7.233	100000	100	1	9807	980.7	9.807
1 mN-m	0.142	0.009	0.0007	10.2	0.01	0.0001	1	0.1	0.001
1 cN-m	1.416	0.088	0.007	102	0.102	0.001	10	1	0.01
1 N-m	141.6	8.851	0.738	10197	10.20	0.102	1000	100	1