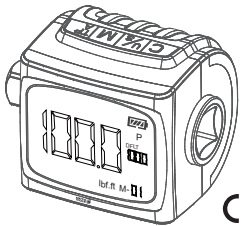


DIGITAL TORQUE & ANGLE METER



This manual will help you use the many features of this device. Please read the manual completely before operating the meter and keep it nearby for future reference.

1. PRODUCT OVERVIEW

Due to torque / angle measurement and calibration requiring strict certification, torque instruments must possess good temperature, precision, resolution capabilities, and must also be able to correct disturbances (ESD and EMI). And while the characteristics of peripheral components must meet certain specifications, measurement chip must also meet specifications. Because of this, the simplification of peripheral passive elements allows an instrument to accurately measure torque / angle values, which will not only save cost, but also improve maintenance and assembly quality, and reduce the chance of damage while in use.

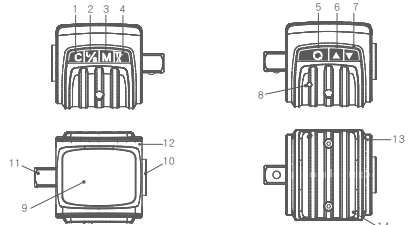
2. PRODUCT FEATURES

Simple multifunctional operation, vibration resistance, torque / angle value presetting, measuring unit selection, mode selection, data memory & storage, digital up & down increments, power-saving mode, color changing display & audible alarm, etc.

- Digital torque, angle and default value display.
- LCD display backlight.
- Accuracy: CW±1.5% (clockwise) CCW±2% (counterclockwise), +/- 2°angle.
- Can be used in both clockwise and counterclockwise directions.
- Units: N.m, Kgf.cm, lbf.in., lbf.ft.
- Buzzer and display LED backlight progress indication.
- Green backlight below 80% target, orange above 80% and red at 100% or above.
- Power saving mode (enters power-saving mode after 2 minutes of inactivity).
- 180° flip screen.
- 30 memory settings for torque reading and 30 for angle reading.
- Low voltage indicator (reminds user of battery life).
- Compatible with zinc-carbon or alkaline batteries.

FUNCTION AND DESCRIPTION

1. Power / clear button
2. Unit selection button
3. Memory selection button
4. Mode selection button
5. 180° flip screen button
6. Value adjustment, up button
7. Value adjustment, down button
8. Buzzer
9. LCD display monitor
10. Input shaft (square drive)
11. Output shaft (square drive)
12. Top cover
13. Bottom cover
14. Battery cover



3. TECHNICAL SPECIFICATIONS

Part Number	BTA115	CTA270
Drive Size	3/8"	1/2"
Torque Accuracy	CW : ±1.5% CCW : ±2.5%	
Angle Accuracy	+/- 2°	
Max. angle measure	720°	
Operation Range	160 Nm 1600 kgf.cm 115 lbf.ft 1400 lbf.in	370 Nm 3700 kgf.cm 270 lbf.ft 3200 lbf.in
	720°	720°
Setting Range	8~160 Nm 85~1600 kgf.cm 6~115 lbf.ft 75~1400 lbf.in	20~370 Nm 190~3700 kgf.cm 15~270 lbf.ft 165~3200 lbf.in
	1~720°	1~720°
Min. scale unit	0.1 Nm · 1 kgf.cm · 0.1 lbf.ft · 1 lbf.in · 0.1°	

Memory Capacity	60 (Torque: 30 / Angle: 30)
Warning	Green LED backlight below 80% target, orange above 80% and red at 100% or above.
Operation Modes	Track(T) / Peak hold(P) / Angle(A)
Unit	Nm, kgf.cm, lbf.in, lbf.ft.
Battery type	AAA (x2)
Battery life (Continuous operation)	48 hrs.
Battery life (Standby mode)	1 year
Operating Temperature	-10°C~60°C
Storage Temperature	-20°C~70°C
Humidity	Up to 90% non-condensing

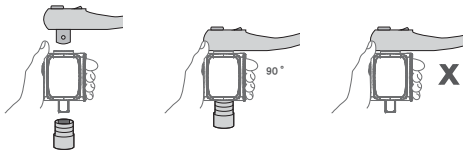
Notes1 : According to ISO6789-2003, a specified measuring range from 20% to 100% of the maximum torque value of the respective tool.

Notes2 : Accuracy of Angle : 1° for 90° rotation at 45°sec.

OPERATION

Digital Torque and Angle Meter

- Make sure to use correct size of wrench and socket to fit in both ends of the device.
- Before using the meter, confirm that the wrench, device and socket are correctly aligned. Then proceed to operate the device.
- If the wrench, device and socket are not properly connected or aligned, do not operate, as this may result in damages to the device.



Do not force in the wrench or socket while the device is still in the Auto-zeroing process. (See section 5.1)

Battery precautions

1. Remove batteries when device will not be used for long periods.
2. Make sure to keep spare batteries at hand when using the device in remote places, long trips or cold areas.
3. Do not mix battery types or combine used batteries with new ones.
4. Do not use leaking batteries or batteries in bad condition.
5. Dispose of batteries only in designated areas. Do not throw batteries into fire.
6. Device is compatible with zinc-carbon or alkaline batteries.
7. If the LCD screen does not display anything, check if batteries are charged or replace them.

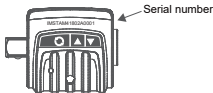
PRODUCT WARRANTY POLICY

Product Warranty

This Digital Torque and Angle Meter is covered by a 1-year warranty against defects in materials and/or workmanship. This warranty does not cover items that have been abused, misused, modified, not given proper maintenance or worn out from normal use.

Serial Number

Product serial number is located on the side of the housing. Please consult with your local dealer for warranty claims.



Warranty Limitations

During the warranty period, if there is any defect or deficiency related to the product's material or manufacturing process which affects the device's operation (including non-human factor or non-resistant external damage), repair services will be provided or product will be replaced if considered necessary.

Warranty Exclusions

If any of the following conditions apply, the product's warranty will be voided. These non-normal conditions will require that the customer pays for repair costs and any other expenses determined by the local dealer.

- Conditions are listed below:
1. Product has not been purchased from authorized distribution channels and/or a proof of purchase cannot be provided.
 2. Product's serial number has been tampered with or is unclear.
 3. Customer did not comply with the user's guide resulting in damages due to improper use. In addition, any damages caused by natural disasters (such as floods, fires, earthquakes, hurricanes, lightning, etc.), external factors (liquid filtration, insect or animal damage, etc.) or human factors (surface scratching, dropping, hitting, etc.)
 4. Surface scratching and abrading of any parts of the product are regarded as normal wear during normal use and therefore considered non-warranty.
 5. Damages due to modifications or alterations done to the product without authorization, or from abnormality of other equipment.
 6. Damages during product transportation.

Acceptable product warranty conditions are as follows:

1. Device does not power on.
2. Buttons cannot be operated.
3. LCD screen is unable to display data.
4. Device's functions cannot be accessed.

Other situations will be handled as maintenance services.

If product needs to be replaced, a device of the same specifications or better will be provided to the customer and the defective unit will need to be returned.

Other Suggestions

Please confirm your product specifications and accessories.

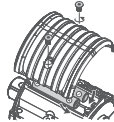
Reserved Rights

We reserve the right to change these terms and conditions at any time and without prior notice. We will post new terms in case of modifications, however we will not inform individual customers.

4. BEFORE USING THE METER

4.1 Battery Installation

1. Open battery cover (Remove screws with H2 Hex bit)
2. Insert battery, make sure polarity is correct.
3. Close battery cover (Tighten screws with H2 Hex bit)



4.2 Low Voltage Indicator

When battery voltage drops below 2.3 volts, the battery icon at the upper right corner of the display will start blinking and the device will shut off after several seconds.



5. PRODUCT FUNCTIONS

Button	Function
C	Power and clear
U/S	Unit selection
M	Memory selection
T/P/A	Mode selection
↺	Screen flip
▲	Increases number (UP)
▼	Decreases number (DOWN)

5.1 Power and Clear

Make sure the device is standing perfectly still and press the C button to turn it on. After the backlight LED flashes, the display will show 0000 (auto-zeroing) and then enter the operating mode. If the device detects it is not standing still, the display will keep continuously showing 0000 from left to right until the device is completely static. When the four zeros are displayed at the same time for three consecutive times, then the device will enter operating mode.

When the meter is used for the first time, after entering operating mode the display will show the lowest operating value, the units will be set to N.m, memory will be set to #1, mode will be set to Track "T" and the battery scale will show current battery life. (All 30 memory data sets will be set the same way.)

Turn Off: Press C button and hold for 3 seconds to switch off.

Clear: Press C button to reset (with device turned on).

5.2 Unit selection

This device works with international metric units of N.m and Kgf.cm and British units of lbf.in and lbf.ft. Press the U/S button to select desired unit (preset unit is N.m).

Torque unit conversion table :

	lbf.in	lbf.ft	Nm	kgf.cm
1 lbf.in	1	0.083	0.113	1.152
1 lbf.ft	12	1	1.356	13.83
1 Nm	8.851	0.737	1	10.2
1 kgf.cm	0.868	0.072	0.098	1

5.3 Memory Function

All memory data sets are preset to the maximum operating value in N.m. To select a memory data set press the M button, the digit at the bottom right corner of the display (M-01) will start blinking; use ▲ (up) or ▼ (down) to scroll through memory data sets (up and down buttons can be held down for continuous increase or decrease). Press M button to select desired memory data base; after selection digit will stop blinking.

5.4 Track mode T / Peak Hold Mode P / Angle mode A

Track mode :

After setting a target torque value (for example 50 N.m), the user will gradually apply force to the wrench until reaching desired target. When force is applied, the displayed torque value will start to increase from zero and vary as the user applies different amounts of force; the torque reading will increase as applied force increases and decrease as applied force decreases. If there is no force applied to the wrench the torque reading will go back to zero.

Peak mode :

After setting a target torque value (for example 50 N.m), the user will gradually apply force to the wrench until reaching desired target. When force is applied, the displayed torque value will start to increase from zero and the device will hold on the display the maximum torque reached. If the user decreases the amount of force applied, the torque reading will not decrease. After reaching a determined torque value, the display will hold that reading and blink for 10 seconds (no actions or buttons will be effective at this time) and automatically go back to show the original setting data, the user can also press C button to return to the selected value or apply force again and the torque reading will restart form zero.

Angle mode :

After setting a target angle value (for example 50°), the user will gradually apply force to the wrench until reaching desired target. When force is applied, the displayed angle value will start to increase from zero. After reaching a determined angle value, the display will hold this reading and begin blinking (during this time the display will also show the amount of torque applied to reach said angle; torque units can be chosen by user.) If the user needs to swing back the wrench to complete angle target, the device will automatically hold the angle value reached on the previous swing and add the angle value from the next swing. The angle reading on the display will change to the preset value after 10 seconds if no applied force detected, but it will show the latest angle value automatically when force is applied again. The user can press the C button to clear the angle value, and the angle reading will start from zero when applying force.

5.5 Range Selection for Pre-set Memories

Torque or angle values can be freely selected as long as force is not being applied or memory selection has not been performed. After completing torque or angle measurement in either mode, the selected target value will be displayed.

5.6 Scroll ▲(UP) / ▼(DOWN) Selection

When setting a target value, pressing the ▲ (up) button once will cause the value on the far right of the display to increase by one unit; pressing and holding the button will cause the value to increase continuously. Pressing the ▼ (down) button once will decrease the value on the far right by one unit; pressing and holding the button will decrease the value continuously.

5.7 Screen flip

By pressing the ↺ button the screen will flip 180°.

5.8 LCD Display/ Monitor Color Changing & Audible Buzzer Warning

• In track mode, for example when the target torque value is set to 20 N.m, the reading will begin to increase from zero as soon as force is applied. Below 80% of target value, the display backlight will be green. Above 80%, the backlight will turn orange and the buzzer will start to beep. As the torque reading continues to approach target value, the beeping will be faster; when 100% is reached, the backlight turns red and the beep becomes continuous. Red backlight and continuous beep will also be present above 100% target. Beeping frequency will decrease as applied force decreases.

• In peak mode, the warnings behave the same as in track mode, but the LED backlight and beeping will stop once applied force ceases.

• In angle mode, for example when the target angle value is set to 20°, the reading will begin to increase from zero as soon as force is applied. Below 80% of target value, the display backlight will be green. Above 80%, the backlight will turn orange and the buzzer will start to beep. As the angle reading continues to approach target value, the beeping will be faster; when 100% is reached, the backlight turns red and the beep becomes continuous. Red backlight and continuous beep will also be present above 100% target. Beeping frequency will decrease as applied force decreases.

5.9 Battery Life Indicator

The battery life indicator is shown on the display and it consists of four bars. A battery voltage of 3V or above is shown as a complete charge (four bars), a voltage lower than 2.8V is shown as three bars, lower than 2.6V is shown as two bars and less than 2.4V is shown as one bar; when voltage is lower than 2.3V, all functions will cease and the device will turn off after the battery indicator flashes for 5 seconds.

5.10 Reset Memory Function

Press and hold the C button + ▼ (down) button; after 5 seconds, all values stored in memory will reset to factory preset values.



5.11 Backlight Switch

Press the C button + ▲ (up) button to turn the display backlight on or off. The backlight is preset as on.



5.12 Reset

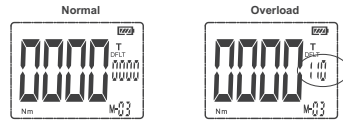
To ensure accurate readings, always press C button to reset the device before using it. This reset function is disabled while in use to prevent errors in measured values.

5.13 Power Saving Mode

The device will automatically enter power saving mode after 2 minutes of inactivity. Press C button to exit power saving mode.

5.14 Overload Warning

Switch off and back on or reset device if screen continues to display 110%. This means device has been forced to 110% of its maximum torque specification. Overloading may result in damages or loss of accuracy.



6. MAINTENANCE AND TIPS



ATTENTION ATENCIÓN AVERTISSEMENT



In order to maintain device's accuracy, it is recommended to perform calibration once a year.
For calibration and repairs please contact IMS customer service at 813-231-0111 or rga@ims-tools.net.

- Do not use any organic solvents to clean the product (alcohol, paint thinner, etc.)
- Avoid contact or proximity to magnets.
- Do not apply heavy force or pressure to the LCD display.
- Do not use the device as a striking tool.
- Do not hit the product with a hammer or similar tools.
- Exceeding the device's maximum torque specification may result in damages or loss of accuracy.
- Avoid contact with water.
- If product gets wet, immediately wipe with a dry cloth.
- Do not expose the device to high temperatures, direct sunlight or damp environments.
- Do not expose device to excessive dust or sand.
- Do not shake violently and avoid dropping device.
- Remove batteries when device will not be used for long periods.
- Dispose of batteries in designated areas. Do not throw batteries into fire.
- Please read manual carefully and follow all instructions before using this device.
- Do not attempt to use the meter while turned off.
- Do not use additional tools to increase leverage, such as metal or plastic pipes.
- Do not touch any button when torque is exerted.
- Avoid contact between device's shaft and electrical sources or disconnect power supply before use. Contact with external voltages will damage device's circuit.