

TOHNICHI DIGITAL RETIGHTENING WRENCH

MODEL CTB2-G

OPERATING INSTRUCTION



CTB100N2X15D-G



CTB850N2X32D-G



To use this product correctly and safely, please read this manual carefully before use.

If you have any questions about the product, contact your nearest distributor or TOHNICHI MFG. CO., LTD.

Cautions on Safety

To the User

In order to use the torque wrench properly and safely, please read this instructions before operation.

If you have any questions, please contact your nearest distributor or Tohnichi Mfg. Co., Ltd.

Keep this operating instruction for future use.






The safety alert symbol

This symbol means Attention! become alert! Your safety is involed.

Take preventive measures in this manual and performing "safety use and appropriate management."

Signal Words

Signal word is the title which shows the item which should be known on safe reservation of people and the handling of equipment. The signal word on safe has the classification of "danger", "warning" and "cautions" by the degree of a risk of doing to people. It uses with a safe cautions symbol and the following situation is shown, respectively.

- "  Danger" : Imminent danger acting as a serious obstacle.
- "  Warnibgs" : A potential risk of becoming a serious obstacle.
- "  Cautions" : A potential risk of becoming anobstacle although it does not result seriously.

Warnings

- ① Use only a dedicated charger and storage battery referred in this manual.
Please do not use any other chargers or storage batterys not designated on this manual.
- ② Charge correctly
Please use the charger only listed in this manual.
It may generate heat unusually and there is fear of fire.
Do not charge a storage battery where temperature is less than 0 degree, and more than 40 degrees C.
Doing so may cause battery to burst or set on fire.
Please charge a storage battery in a well ventilated place.
Please do not cover a charger or a storage battery with cloth etc.
Doing so may cause battery to burst or set or fire.
When not using charger, extract plug from outlet to avoid electric shock or fire.
- ③ Take the circumference situation of work place into consideration.
Please do not use main part, a charger, and a storage battery in rain, or in a place which became wet or got wet.
Doing so could cause electric shock, component failure or fire.
Keep work place well lit to avoid any accidents.
Please do not use or charge in a place where inflammable liquid and gas exist.
It may cause explosion or fire.
- ④ Surely use designated accessories and optional articles only.
Please do not use other accessories and optional articles not designated in this manual.
Doing so may cause an accident or injury.
- ⑤ Do not put a storage battery into fire.
It may burst or a toxic substance may come out.
- ⑥ Do not disassemble or remodel the instrument.
It may damage safety, or function, and cause lower durability, or failure.
- ⑦ Switch lever, ratchet firmly. (Standard accessory interchangeable head : QH)
Ratchet slip may cause accident, injury or failure.
- ⑧ Do not make connect a pipe to make handle longer.
It may cause breakage of the body or be the reason of accuracy problem.
- ⑨ Take counter measures to use in a high place.
Drop of body or socket may cause accident, injury or reason of failure.

Cautions

- ① **Keep a work place always clean.**
Untidy place or work stand may cause an accident.
- ② **Do not bring a child to work place.**
A child could be accidentally injured.
- ③ **When you do not use it, keep it in a right place.**
Keep work place when not using and always put all equipment and tools away to avoid any injuries.
Do not keep any main part or battery in a place where the temperature will go to 50 degrees C or more.
Doing so may cause degradation to the battery.
Battery can also start to smoke and / or start on fire.
- ④ **Do not force tool to work.**
In order to work efficiently and safely, please work with the torque range of the tool and the part that the tool is being used on.
- ⑤ **Use the tool to fit work.**
Always make sure that you use the proper size tool with the proper torque range for each part .
Forcing tool can cause injury to one's self and damage to tool.
- ⑥ **Do not handle the battery cord roughly.**
Do not carry a battery by its cord.
Do not put cord by heat, gas, oil, or sharp corner.
Doing any of above can cause electric shock and / or fire by short.
- ⑦ **Always brace yourself and maintain balance.**
Not doing so may cause injury to one's self.
- ⑧ **Maintain carefully**
Exchange of accessories should follow the manual.
It may cause injury.
Check cord periodically.
If damage is found, replace it with new one.
A damaged cord can cause electric shock, fire, and /or otherinjuries.
Keep grip area and in good condition.
Keep out of oil, and grease.
- ⑨ **Check case and other parts for any damage before usage.**
Check all functions for any damage before usage.
Do not use a charger if inlet plug and / or cord are damaged.
Do not use a charger if it is dropped and something is damaged.
It may cause electric shock and fire by short.
Ask distributors or Tohnichi for damaged case, other parts replacement, and repair.

Notes

- (1) Charge only with a charger attached.
- (2) Only use the battery model designated in this manual.
- (3) Do not cause shock or vibration to this instrument.
- (4) Only use this tool in the way that the manual states.
- (5) Check starting inspection before usage, and confirm the setting.
- (6) This instrument has a possibility of trouble or breakage if wet by water or oil.
- (7) Do not drop or hit this instrument because it may cause trouble or breakage.
- (8) Use this instrument within measuring range of the manual.
- (9) Do periodical inspection for this instrument.
- (10) Do zero adjustment before measurement.
- (11) Surely hold effective line of the handle to do accurate measurement, and apply force at right angle to the torque wrench.
- (12) Connect body and interchangeable head surely.

If there is strange smell or fire on usage, stop use .

Move this instrument to a safety place, and contact Tohnichi.

★ For handling of used battery ★

Nickel metal hydrogen battery is used on this product.

Do not dispose unnecessary battery and recycle it to protect resources.

Ask your nearest distributor or Tohnichi Japan or overseas facilities.



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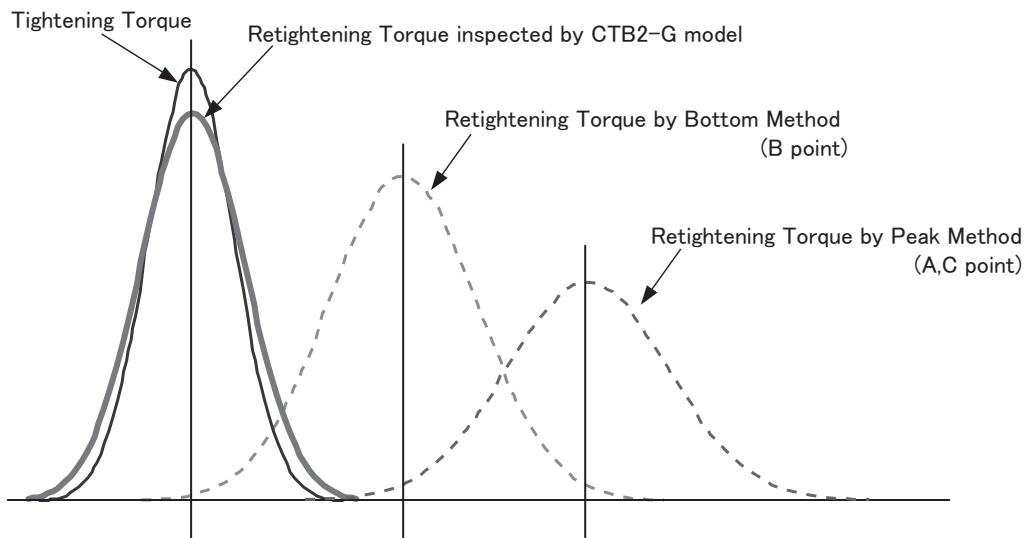
1. Outline

This digital torque wrench is designed for re-tightening inspection of the tightened bolt.

By conducting retightening operation, an operator can easily detect the torque applied on the tightened bolt. CTB2-G is the upgraded version of CTB.

2. Features

- ① Anyone can easily check the bolt on applied the tightened bolt.
- ② Measuring results differ little depending on individuals.
- ③ Saves measuring time.
- ④ 7 segment LED used for bright display of digital values
- ⑤ Memory capacity expanded to 999pcs (Conventional model: 50pcs)
- ⑥ Can be used for both clockwise and counter-clockwise measuring.



3. Components

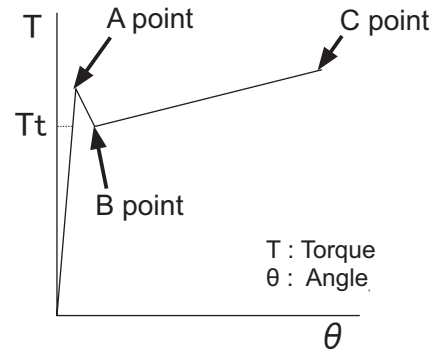
- 1) Main Body 1pc
- 2) Standard Accessories
 - Battery pack BP-5 1pc
 - Interchangeable head QH 1pc
 - Quick Charger 1pc
- 3) Operating Instruction 1pc

4. Retightening Torque Method

○ Retightening Torque Method

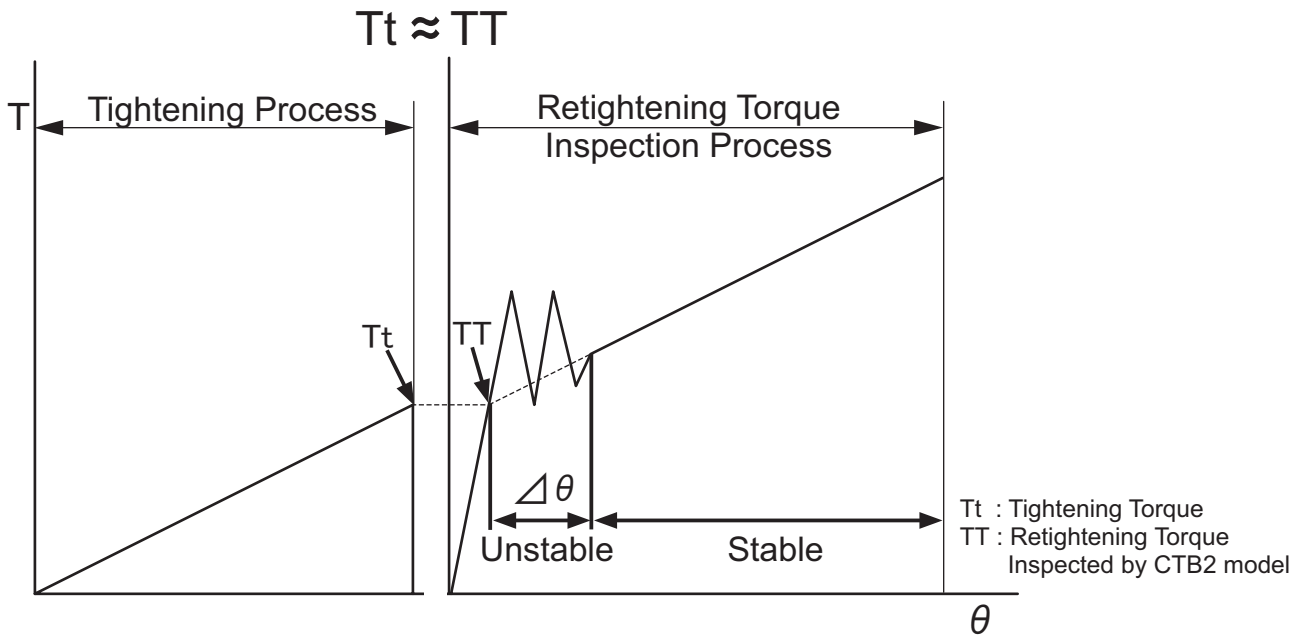
Retightening torque method aims to measure the torque at which a tightened bolt starts to rotate again as further torque is applied. The retightening measured values are classified to either of the below 3 kinds.

- The torque which overcome the static friction of the bolt (A point)
- The torque at which the bolt starts to turn continuously (B point)
- The maximum torque at this inspection (C point)

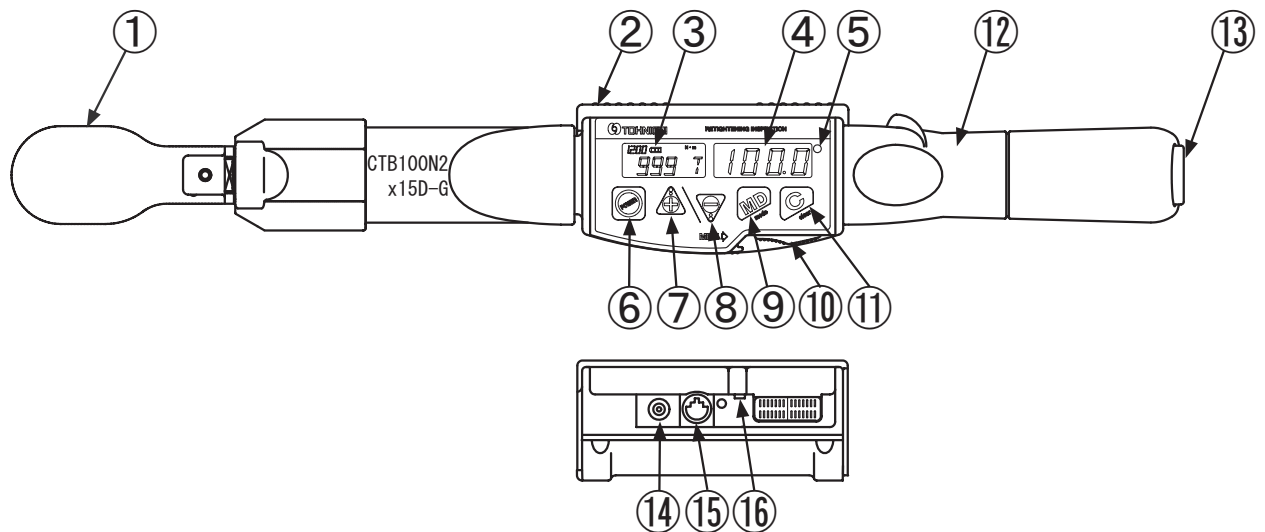


○ Proposal of New Retightening Method (T-point method)

Retightening torque first starts with the rotation of the head only, then the screw starts to rotate. Shifting from static friction to dynamic friction, the friction whip settles and the torque starts to increase at the steady pace again. Basically, the straight torque-angle line drawn after entering the stable stage (right side of the below illustration) is in the extension of the straight torque-angle line in the tightening process (left side of the below illustration).

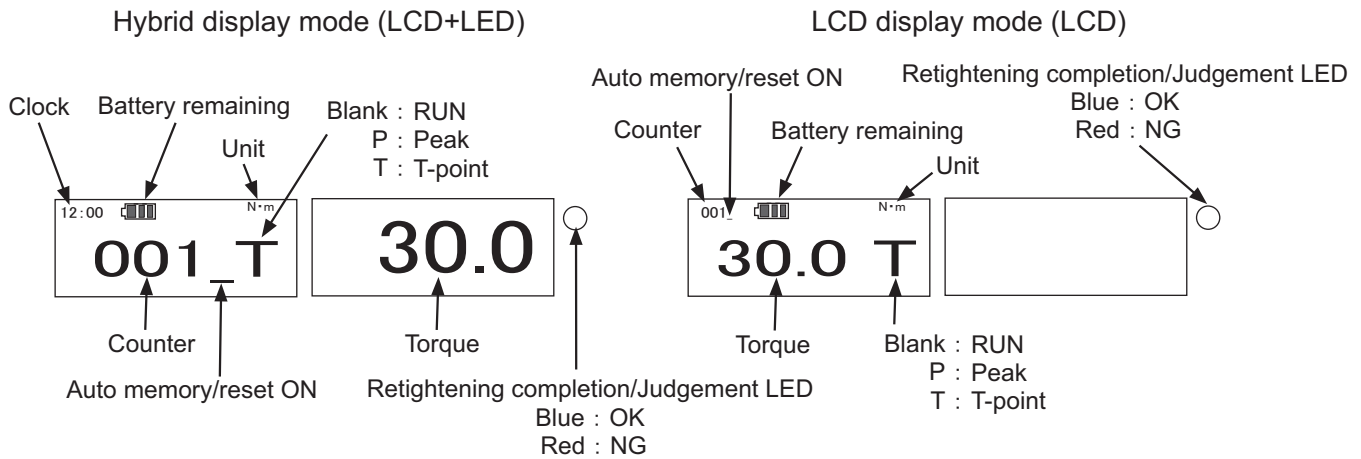


5. Name and Explanation of Each Part



- ① Interchangeable Head
QH interchangeable head comes as standard accessory. Other interchangeable head SH,SH-N,RH,QH,RQH,DH,HH,FH are also attachable.
※ PH (Pipe Wrench Head) cannot be attached.
- ② Protection cover
It protects CTB2-G from physical damage and breakage.
- ③ LCD display
It displays memory counter, time, residual battery indication and unit.
- ④ 7 segments LED display
It displays torque value
- ⑤ Retightening completion/Judgement LED
After completing retightening, blue LED turns on when OK, and red LED when NG.
- ⑥ Power key
Turn the power on/off. After turning on, put it still for a few seconds for automatic angle speed check.
- ⑦ ▲ key
Send the memory counter forward by one, and read out the data if any. If you keep it pressed, it skips by 10pcs.
- ⑧ ▼ key
Reverse the memory counter backward by one, and read out the data if any. If you keep it pressed, it skips by 10pcs.
- ⑨ MD key
Press this key in PEAK mode, it turns to external output mode. Pressing this key more than 2 sec. in RUN mode, it turns to setting mode.
- ⑩ MEM key
Saves the measured data and send the memory counter forward by one.
- ⑪ C key
Clear the measured data.
- ⑫ Handle
BP-5 battery pack is stored inside.
- ⑬ Cap
Remove this cap (counter clockwise thread) when exchanging battery pack.
- ⑭ Recharging jack
Connect BC-3 battery charger to this terminal.
- ⑮ External output terminal
Connect communication cable to this terminal.
- ⑯ Reset switch
Use this switch only when error occurs. Do not use it at every recharge.

Basic Display



6. Explanation of Functions

① Auto zero function (Torque)

Auto zero function will be activated as C key is pressed in RUN mode.

(Auto zero functions only when the displayed torque is below 7.5% of the max capacity torque).

"Err9" will be displayed if the displayed torque is over 7.5% of the max capacity torque.

If "Err9" appears, refer to Page 24 "14. Error Message".

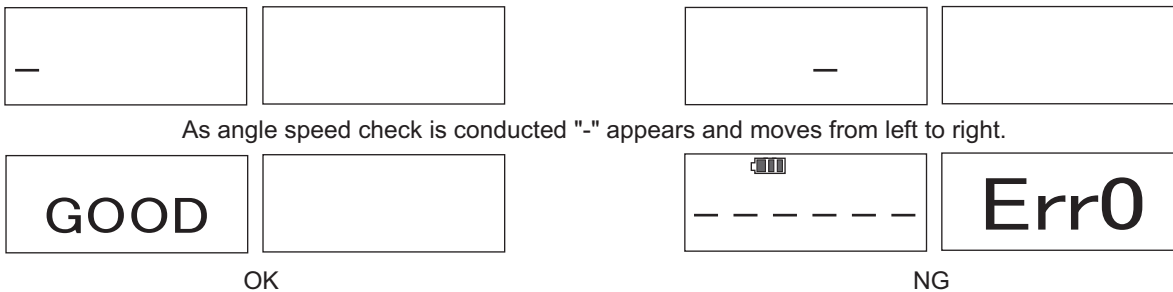
② Angle speed check and adjustment function

Angle speed check will be conducted as the power is turned on. CTB2-G must be put still (don't move) during adjustment.

If CTB2-G is moved during adjustment, "Err 0" appears.

Angle speed adjustment will also be automatically conducted when CTB2-G is put still for 2 seconds or more.

If "Err0" appears, refer to Page 24 "14. Error message".



③ Auto memory/reset function

Measured data will be automatically saved after set timing (0.1 – 5 seconds) and go on to the next counter. If you do not want to turn off the Auto memory/reset function, set it to 00 second.

In case of judgement mode

Judgement is OK: It send the memory counter forward after the setting time.

Judgement is NG: Auto memory/reset is ineffective.

④ Judgement function

It judges whether the measured value is within the allowable torque range (upper/lower limit). As soon as T-point appears on the display, judgement will be made. Blue LED turns on for OK, and red LED turns on with buzzer for NG. Press MEM key to forward the memory counter to next. Press C to clear the data.

⑤ No sound function

Set the buzzer sound to "OFF". Buzzer sound on key operation will be cancelled.

⑥ Power saving function

If you leave it unused for more than 1 minute, 7 segments LED will be turned down for powersaving. It turns up again as you press any key or apply torque.

Power saving function will not be effective when you turn off Auto power off function.

⑦ Auto power off function

Power will be automatically turned off when it is not used for designated timing (Default setting: 3 minutes). If you want to cancel this function, set it OFF.

When "LoBATT" (Low battery) appears, power will be turned off in 1 minute regardless of Auto power off function.

⑧ Residual battery indicator

Residual battery level will be indicated on LCD.



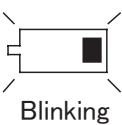
Enough battery remains.



Battery remaining is not enough.
Usage time is about half.



It is time to charge battery.



"LoBATT" alarm condition

No battery. Charge immediately.

Display "LoBATT" on LCD shows no key operation except power switch.

On this condition power will be off in 1 minute.

Memorized data and settings will not disappear even if without battery.

⑨ Over torque alarm

If the applied torque exceeds 105% of the max capacity torque, the buzzer goes off and "-----" will be displayed alternately. In PEAK mode, "E-3" and torque value will be displayed alternately. At this time, MEM key cannot save measured data.

If it shows "E-3", refer to Page 24 "14. Error Message".

⑩ Over torque alarm/Minimum peak hold torque list

Model	Torque Range		1digit	105% of Max. Torque	7.5% of Max. Torque	Below 7.5% of Max. Torque
	Min.	Max.		Over Torque Alarm	Peak Hold Start	Auto Zero Range
CTB10N2X8D-G	2	10	0.01	10.50	0.75	0.75
CTB20N2X10D-G	4	20	0.02	21.00	1.50	1.50
CTB50N2X12D-G	10	50	0.05	52.50	3.75	3.75
CTB100N2X15D-G	20	100	0.1	105.0	7.5	7.5
CTB200N2X19D-G	40	200	0.2	210.0	15.0	15.0
CTB360N2X22D-G	72	360	0.4	378.0	27.0	27.0
CTB500N2X22D-G	100	500	0.5	525.0	37.5	37.5
CTB850N2X32D-G	170	850	1	893	64	64

※ All the units except N·m, calculate the torque value based on the unit conversion table on "Page 17".

7. Explanation of Each Mode

① Data sampling mode

- RUN mode

Set the counter to "000". Display shows the torque value currently applied. Torque value increases as you apply torque, and decreases to zero as you release it.

- PEAK mode

Set the counter to "000-999". Torque value increases as you apply torque, and the peak value remains on the display after releasing the torque. After retightening, T-point value will be figured out on the display.

② Measurement mode

- NORMAL (Default setting)

Standard measurement mode.

- LONG (Long bolt/Long socket retightening mode)

Set the measurement mode to "LONG".

Choose this mode if NORMAL mode does not work. (Ex. When you use a long socket or long bolt.)

※ If you are using CTB2-G for a long bolt or long sockets of twist nature such as hex socket, it may result in an error value (very small torque value). In such case, please change the setting from "NORMAL" mode (default) to "LONG" mode and try the measurement again.

③ Memory mode

- M999 mode (default)

Set the memory mode to "M999".

Max. 999 pcs of measured data can be saved in the memory.

External output also includes measured time (clock).

- M99 mode (CTB compatible mode)

Set the memory mode to "M99".

Max. 99 pcs of data can be saved in the memory.

External output format is compliant with CTB.

※ For details of data output format, refer to Page 16 "9. External Output Format".

④ Display mode

- Dual display mode (default)

Set the display mode to "LED".

LCD shows the counter and clock, and 7 segments LED shows the torque.

- LCD display mode (power saving mode)

Set the display mode to "LCD".

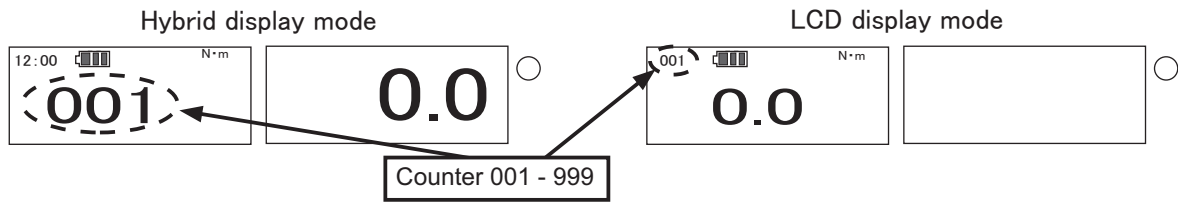
Upper left of LCD shows the counter and the torque will be displayed in the center. 7 segment LED is turned off.

Note) Please refer to Page 17 "10. Various Settings" for detailed setting procedures.

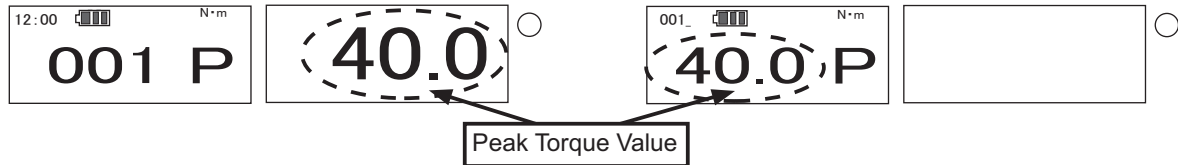
8. How to Use

① Retightening measurement

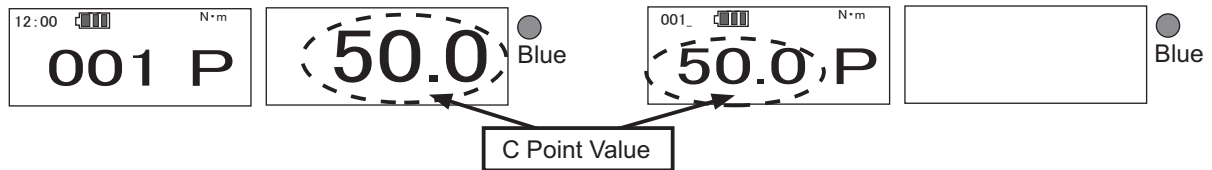
Set the counter to 001-999 to start retightening.



Peak torque is displayed as you apply torque.

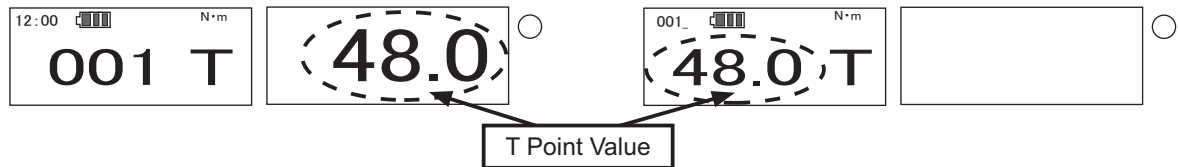


When it reaches a certain point to detect T-point, buzzer goes off and blue LED turns on.



After releasing torque, T-point will be calculated and displayed.

In judgement mode, judgement will be made at the same time.



• OK: Blue LED turns on.



• NG: Buzzer goes off and red LED turns on.



Press MEM key to save the data (regardless of judgement result OK/NG) and proceed to the next counter.

Press C key to clear the data.

When Auto memory/reset is activated

Judgement OK: Auto memory/reset is effective, and the memory counter will be sent forward.

Judgement NG: Auto memory/reset is not effective. Press MEM key to save the data and proceed to the next counter.

Press C key to clear the data.

※ If upper and lower limit is set to 0N·m, judgement will not be made.

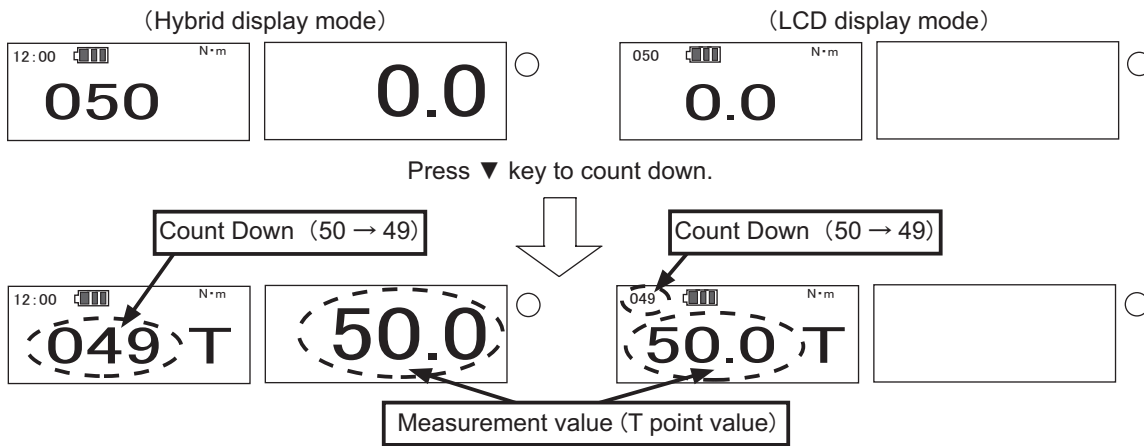
※ If the data in the previous measurement is not deleted, this old data may appear when you send forward the counter.

Press C key to delete the old data.

If you conduct retightening when T-point value is already shown on the display, buzzer goes off and "----" and the torque value will be shown alternately.

② Reading out the measured data

Press ▲ key to send forward the counter, and ▼ key to return the counter and read out the measured data.



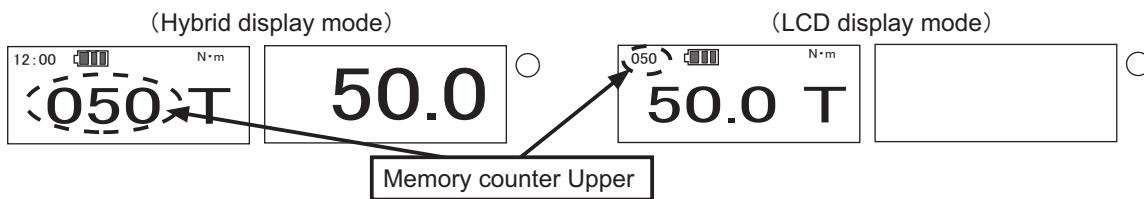
※ If you push ▼ key when the memory counter is 001, it turns to 000, and enters RUN mode.

※ If you push ▼ key when the memory counter is 000, it turns to 999 (99 in M99 mode) and read out the measured data then.

③ Calculation function

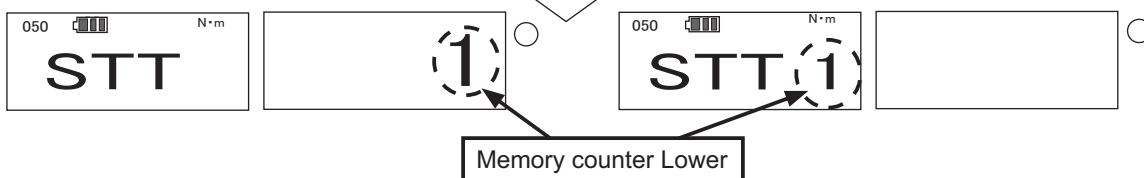
The number of data samples, maximum/minimum/average torque will be calculated and displayed.
(Example shows the calculation of 001-050 range of data).

Use ▲▼ key to set it to the upper limit of the selected data range.



Press MD key to be ready for calculation.

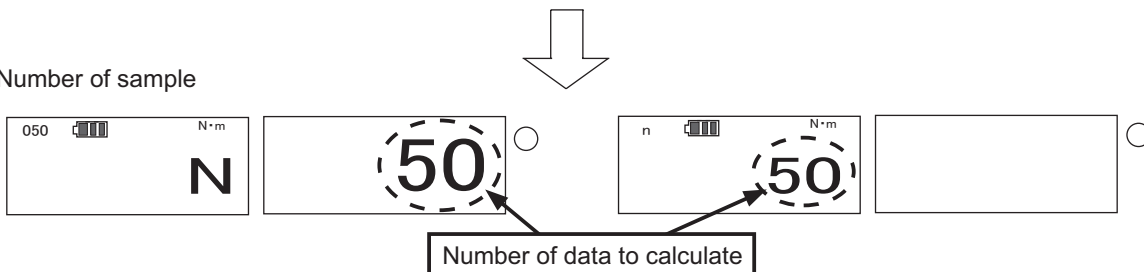
• Starting counter of Calculation



Use ▲▼ key to select the lower limit of the selected data range.

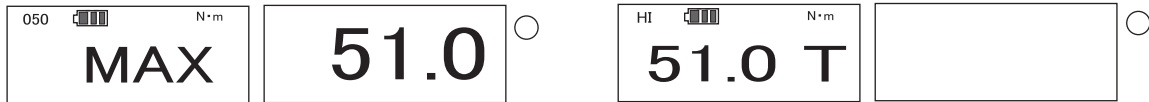
Press MD key, then it shows the number of sample data. (Press C key to cancel.)

• Number of sample



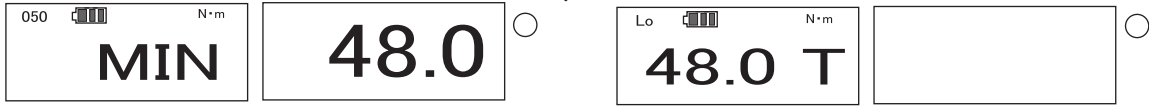
Press MD key to show the maximum torque value of the selected data range. (Press C key to cancel.)

- Maximum torque data



Press MD key to show the minimum torque value of the selected data range. (Press C key to cancel.)

- Minimum torque data



Press MD key to show the average value of the selected data range. (Press C key to cancel.)

- Average value



Press MD key or C key to return to memory display.

- Measuring Condition



④ Transfer measured data to external device

To transfer data to PC, Use the dedicated communication cable (No.584 or No.575). Choose "PC" for communication setting. To transfer data to printer, use the dedicated communication cable (No.575) and choose "Prn" for communication setting. Also, baud rate, data length, and parity need to be set respectively.

※ If you are using the communication cable No.584, data length should be set as 8 bit.

※ For detailed ways of setting, refer to Page 17 "10. Various Settings".

● Output 1 data

If you want to output 1 data only, use ▲▼ key to select the data and press MEM key to output.

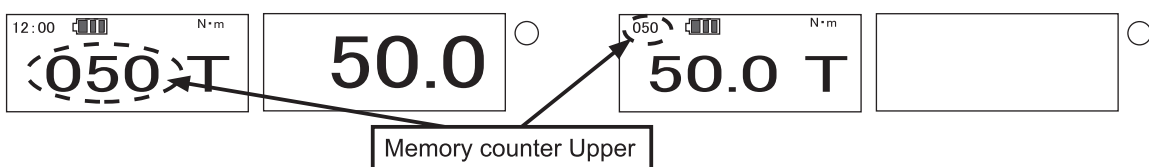
● Output a range of data

If you want to output a range of selected data at one time, follow the below instructions.

Use ▲▼ key to select the upper end of the selected data range.

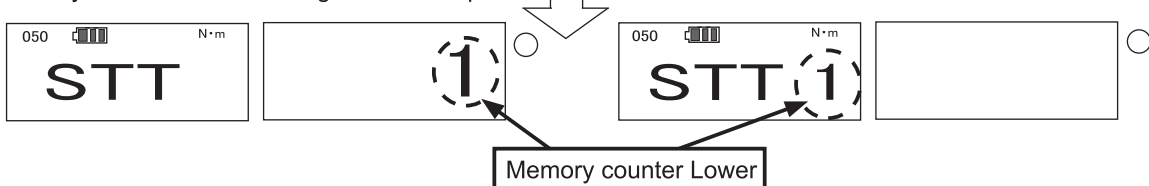
(Hybrid display mode)

(LCD display mode)



Press MD key to be ready for a range of data output.

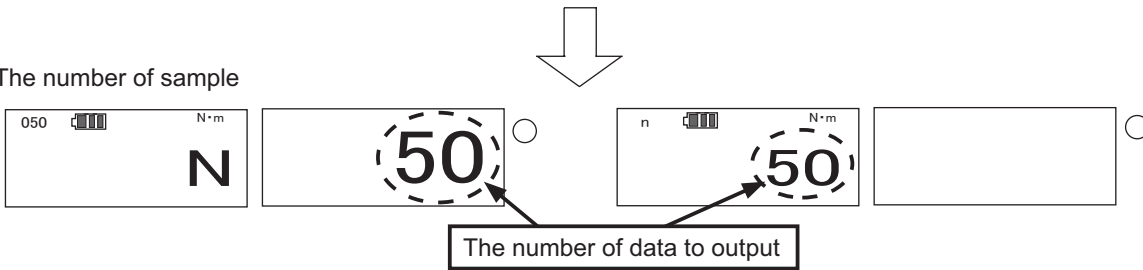
- Memory counter to start a range of data output



Use ▲▼ key to select the lower end of the selected data range, and press MD key.

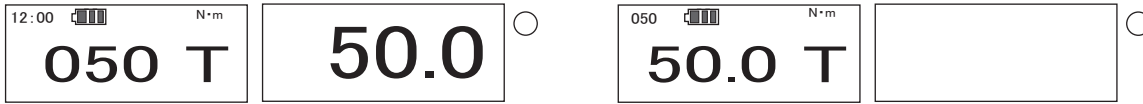
The display shows the number of sample. (Press C key to cancel.)

- The number of sample



Press MEM key to output all data at one time (Press C key to cancel).

After outputting data, display will return to the number of sample screen. Press C key to return to measuring. Press MEM key to output data again.



⑤ Delete measured data

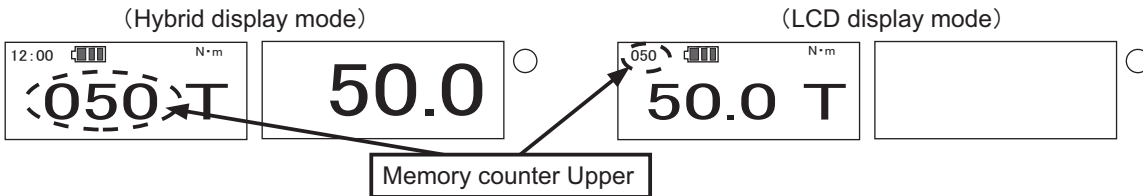
- Delete 1 data

To delete 1 data, use ▲▼ key to select the data to delete and press C key to delete.

- Delete a range of data

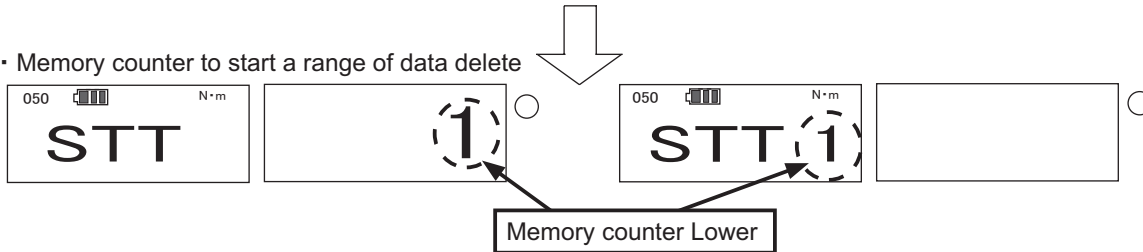
To delete a range of data at one time, follow the below instructions.

Use ▲▼ key to select the upper end of the data range.



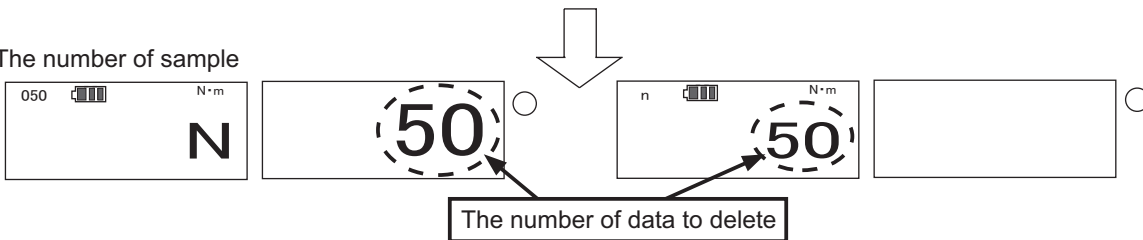
Press MD key to be ready for a range of data deletion.

- Memory counter to start a range of data delete



Use ▲▼ key to select the lower end of the selected data range to delete and press MD key. It shows the number of sample to delete. (Press C key to cancel).

- The number of sample



Press MD key and C key at the same time. The selected data will be deleted at the same time, and it returns to measuring condition.



9. External Output Format

① communication setting

Synchronous method : asynchronous
 Baud rate : 2400 / 4800 / 9600 / 19200bps (Default 2400bps)
 Data length : 7bit / 8bit (Default 7bit)
 Stop bit : 1bit
 Parity : EVEN (even) / ODD (odd) / NONE (none) (Default NONE)

② PC output

Use the dedicated communication cable (No.584 or No.575) to connect CTB2-G to PC.

Set the same communication settings on PC as CTB2-G (baud rate, data length, parity)

※ If you are using the communication cable (No.584), set the data length as 8 bit.

M999 mode

R	E	,	9	9	,	1	0	0	.	0	,	1	0	/	0	9	/	2	1	,	1	2	:	5	9	:	5	9	CR	LF
Header		Counter (3 fig.)			Torque (decimal point)						Y/M/D						T:M:S						Delimiter							

M99 mode

R	E	,	9	9	,	1	0	0	.	0	CR	LF
Header		Counter (2 fig.)		Torque (decimal point)						Delimiter		

③ Printer output format (dedicated printer EPP16M3)

○ M999 mode

• Printing 1 data

999: 123.4 N·m	← Counter : Torque value, Unit
09/21 12:45:10	← M / D H : M : S

• Printing all data

1: 100.0 N·m	← Counter : Torque value, Unit
09/21 12:46:12	← M / D H : M : S
2: 101.2 N·m	
09/21 12:47:13	
3: 102.3 N·m	
09/21 12:47:14	
4: === N·m	← If no data, Print "=".
00/00 00:00:00	← Measurement date print "0".

N = 3	← Sample quantity
MAX: 102.3N·m	← Max. value
MIN: 100.0N·m	← Min. value
AVE: 101.2N·m	← Average
	← 3 Figures line feed

○ M99 mode

• Printing 1 data

99: 123.4 N·m	← Counter : Torque value, Unit
---------------	--------------------------------

• Printing all data

1: 100.0 N·m	← Counter : Torque value, Unit
2: 101.2 N·m	
3: 102.3 N·m	
4: === N·m	← If no data, Print "=".

N = 3	← Sample quantity
MAX: 102.3N·m	← Max. value
MIN: 100.0N·m	← Min. value
AVE: 101.2N·m	← Average
	← 3 Figures line feed

10. Various Settings

Refer to below list of functions and explanation of each mode.

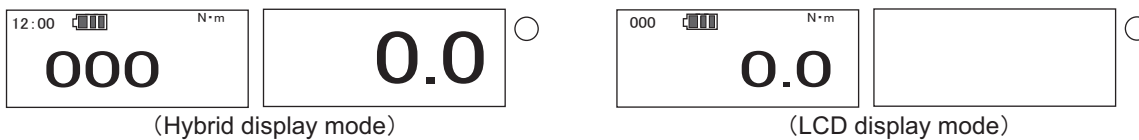
① Setting items

	Subject	Display	Delivery Condition	Select
1	Measurement Mode	SEL	NORMAL	LONG
2	Measurement Unit	USEL	N·m	kgf·cm / kgf·m / lbf·in / lbf·ft
3	Upper Limit	HI	0	Below Max. Torque
4	Lower Limit	Lo	0	Below Upper Limit
5	Auto Memory Reset Timer	Ar	0	0.1~5.0 sec.
6	Buzzer Output	bU	ON	OFF
7	Auto Power Off	PoFF	3MIN	10MIN, 30MIN, NONE
8	Communication Mode	do	PC	PRN
9	Baud Rate	bPS	2400	4800, 9600, 19200
10	Data Length	dL	7BIT	8BIT
11	Parity	Prt	NONE	ODD, EVEN
12	Memory Mode	dCn	M999	M 99
13	Display Mode	dSP	LED	LCD
14	Setting Default	dFLt	DFLT-N	DFLT-Y
15	H:M:S	rtC1	None	--
16	Y:M:D	rtC2	None	--

※ Tightening mode, clock and date will not be reset by default operation.

② Settings

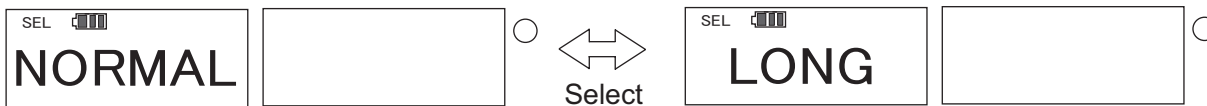
Use ▲▼ key to set the counter to 000 RUN mode.



Press MD key for 2 seconds or more till the display turns to the tightening mode setting.

● Measurement mode setting (Default: NORMAL)

Set NORMAL (Standard retightening) or LONG (Long socket or long bolt retightening)



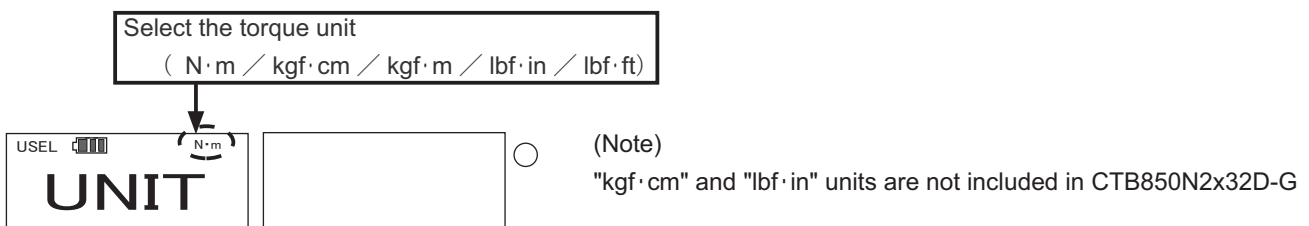
Use ▲▼ key to select NORMAL or LONG and press MEM key to proceed.

(If you press MD key, it proceeds to next without saving. If you press C key, it returns to RUN mode.)

● Setting measurement unit (Default: N·m)

Select the torque unit (N·m / kgf·cm / kgf·m / lbf·in / lbf·ft)

The measured torque and the set torque will be converted into the selected torque unit.



Use ▲▼ key to select the torque unit and press MEM key to save and proceed to the next.

(If you press MD key, it proceeds without saving. If you press C key, it returns to RUN measurement mode).

Unit conversion table

	Conversion factors
N·m → kgf·cm	10.1972
N·m → kgf·m	0.101972
N·m → lbf·in	8.8508
N·m → lbf·ft	0.73756

Rounding of the converted figures

$$100.0[\text{N}\cdot\text{m}] \times 0.73756 = 73.756 \doteq 73.8[\text{lbf}\cdot\text{ft}]$$

$$73.8[\text{lbf}\cdot\text{ft}] \div 0.73756 = 100.05 \doteq 100.1[\text{N}\cdot\text{m}]$$

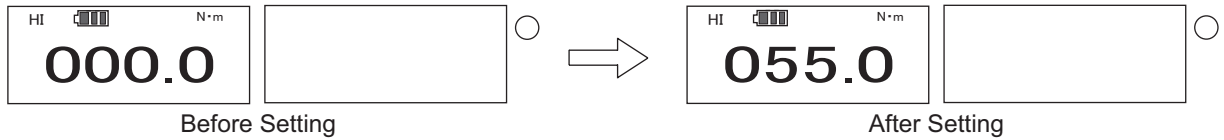
※ Converted figures are rounded as above.

Accordingly, the resulted figures may have a margin of errors.

※ Unit conversion is made based on N·m values with the above conversion factors.

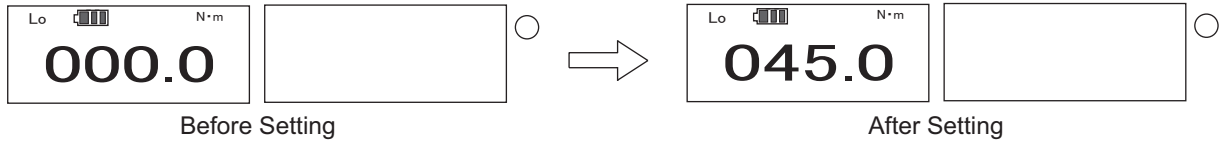
※ All the memory and torque setting values are converted when making a unit change.

● Upper limit setting (Default: 0)



Use ▲ key to select the digit, and ▼ key to select number. Press MEM to confirm and proceed to the next.
(If you press MD key, it proceeds to next without saving. If you press C key, it returns to RUN mode.)

● Lower limit setting (Default: 0)

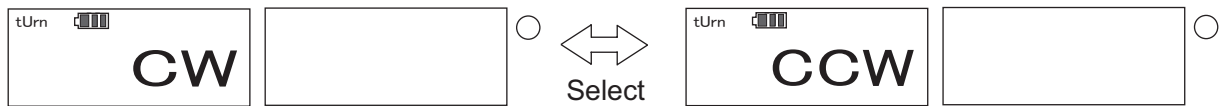


Use ▲ key to select digit, and ▼ key to select number. Press MEM key to confirm and proceed to the next.
(If you press MD key, it proceeds to next without saving. If you press C key, it returns to RUN mode.)

※ If the lower limit is set higher than the upper limit, "SETERR"(set error) appears as you press MEM key, and returns to upper limit setting. Lower limit must be set lower than the upper limit torque value.

● Measurement direction (Default: CW)

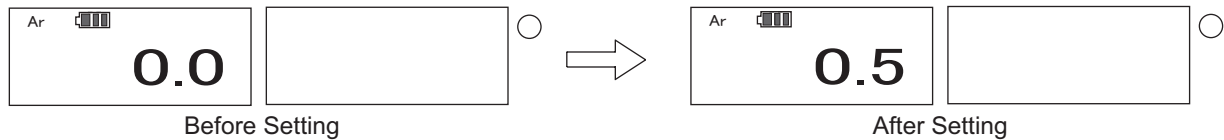
Set the measurement direction CW (clockwise) or CCW (counter-clockwise)



Use ▲▼ key to select and press MEM key to confirm and proceed to the next.
(If you press MD key, it proceeds to next without saving. If you press C key, it returns to RUN mode.)

● Auto memory/Reset timer setting (Default: 0.0)

Measured data will be saved automatically after the setting time (0.1-5.0 sec) and proceed to the next.
If you do not activate auto memory/reset, set it to 0.0.



Use ▲▼ key to select and press MEM key to confirm and proceed to the next.
(If you press MD key, it proceeds to next without saving. If you press C key, it returns to RUN mode.)

● Buzzer setting (Default: ON)

Choose whether or not to activate operation buzzer.



Use ▲▼ key to select and press MEM key to confirm and proceed to next.
(If you press MD key, it proceeds to next without saving. If you press C key, it returns to RUN mode.)

● Auto power off timer (Default: 3 MIN.)

Power will be automatically turned off when it is not used for the set time.
(3MIN: 3 minutes/10MIN: 10 minutes/ 30MIN: 30 minutes, NONE: none)

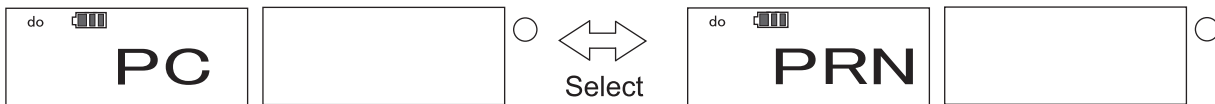
If you choose NONE, it remains ON until the battery is used up.



Use ▲▼ key to select and press MEM key to confirm and proceed to the next.
(If you press MD key, it proceeds to next without saving. If you press C key, it returns to RUN mode.)

● Communication mode (Default: PC)

Select external output format (PC: PC output / Prn: printer output)

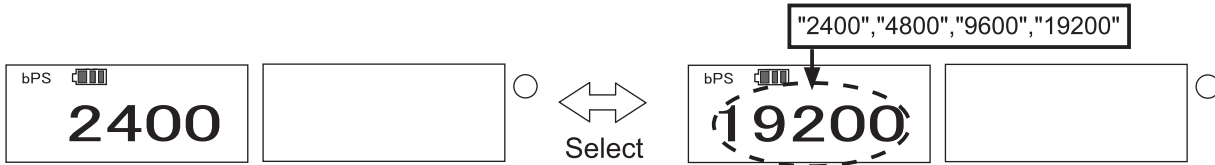


Use ▲▼ key to select and press MEM key to confirm and proceed to the next.

(If you press MD key, it proceeds to next without saving. If you press C key, it returns to RUN mode.)

● Baud rate (Default: 2400 bps)

Communication baud rate for external output (2400bps/ 4800bps/ 9600bps/ 19200bps)



Use ▲▼ key to select and press MEM key to confirm and proceed to next.

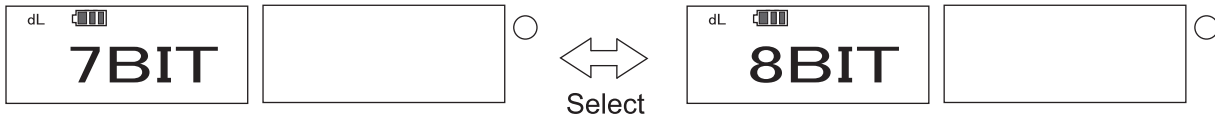
(If you press MD key, it proceeds to next without saving. If you press C key, it returns to RUN mode.)

※ To output data by the dedicated printer (EPP16M3), choose "2400 bps".

※ To output data to PC, set the same baud rate as that of PC.

● Data length (Default: 7BIT)

Set the communication data length for external output.(7 bit or 8 bit).



Use ▲▼ key to select and press MEM key to confirm and proceed to the next.

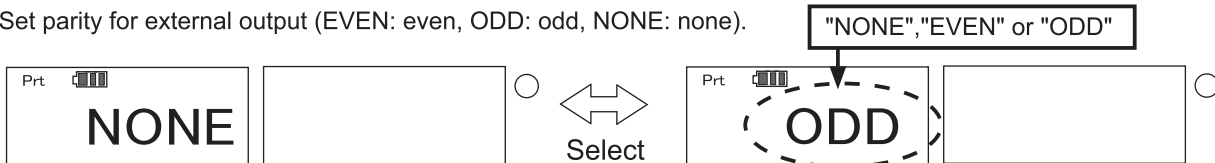
(If you press MD key, it proceeds to next without saving. If you press C key, it returns to RUN mode.)

※ If you use the dedicated USB communication cable (No.584), select 8 bit.

※ If you output to EPP16M3 printer, select 7 bit.

● External output parity (external output) (Default: NONE)

Set parity for external output (EVEN: even, ODD: odd, NONE: none).



Use ▲▼ key to select and press MEM key to confirm and proceed to the next.

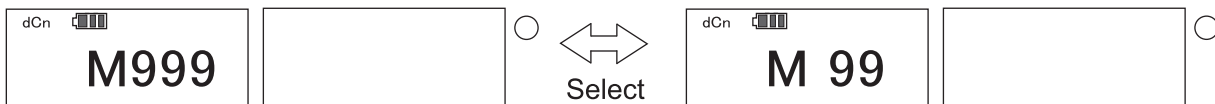
(If you press MD key, it proceeds to next without saving. If you press C key, it returns to RUN mode.)

※ To output data to EPP16M3 printer, choose NONE.

※ To output data to PC, set the same setting as that of PC.

● Memory mode (Default: M999)

Select memory mode (M999: 999pcs of data, M99: 99pcs of data, compliant with CTB data format)



Use ▲▼ key to select and press MEM key to confirm and proceed to the next.

(If you press MD key, it proceeds to next without saving. If you press C key, it returns to RUN mode.)



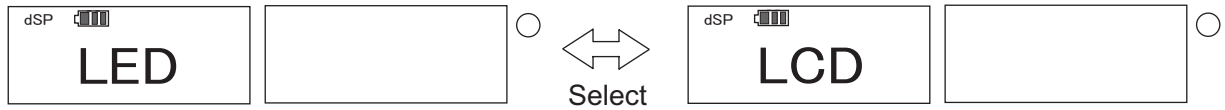
※ If you press MEM key, memory mode changes and the memory data will be cleared.

If you press C key, it returns to "Memory mode setting".



● Display mode (Default: LED)

Select the display mode (LED: LED + LCD dual mode, LCD: LCD only, power saving mode).

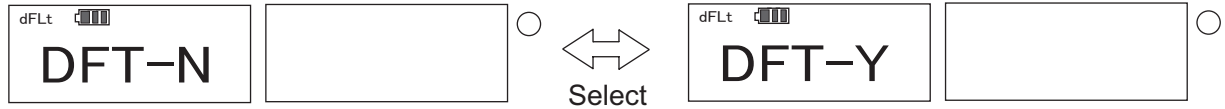


Use ▲▼ key to select and press MEM key to confirm and proceed to the next.

(If you press MD key, it proceeds to next without saving. If you press C key, it returns to RUN mode.)

● Default setting

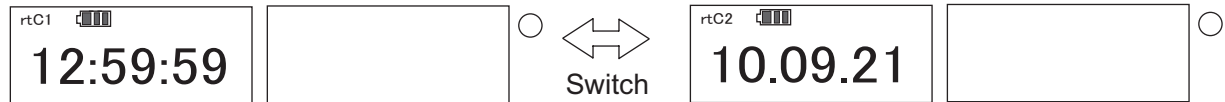
Reset to the default setting (except clock setting)



Use ▲▼ key to select DFT-Y, and press MEM key to reset to default setting.

If you press MEM key or MD key at DFT-N, it proceed to the next without changing the mode. If you press C key, it returns to RUN mode.

● Clock setting



Use ▲▼ key to change time and date

Press MEM key for time setting.

If you press MD key or C key, it returns to RUN mode.

● Setting of clock (H)



Use ▲▼ key to select and press MEM key to confirm and proceed to the next.

(If you press MD key, it proceeds to next without saving. If you press C key, it returns to RUN mode.)

● Setting of clock (M)



Use ▲▼ key to select and press MEM key to confirm and proceed to the next.

(If you press MD key, it proceeds to next without saving. If you press C key, it returns to RUN mode.)

● Setting of clock (S)



Clock starts from 00 seconds as you press MEM key.

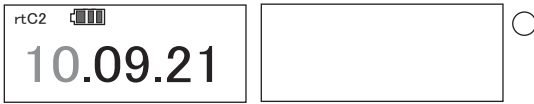
(If you press MD key, it proceeds to next without saving. If you press C key, it returns to RUN mode.)

● Clock display



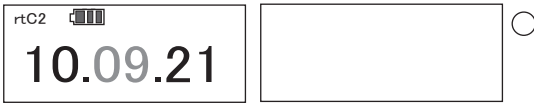
If you press MD key, it proceeds to next without saving. If you press C key, it returns to measuring mode.

● Setting of Y:M:D (Y)



Use ▲▼ key to select and press MEM key to confirm and proceed to the next.
(If you press MD key, it proceeds to next without saving. If you press C key, it returns to RUN mode.)

● Setting of Y:M:D (M)



Use ▲▼ key to select and press MEM key to confirm and proceed to the next.
(If you press MD key, it proceeds to next without saving. If you press C key, it returns to RUN mode.)

● Setting of Y:M:D (D)



Use ▲▼ key to select and press MEM key to confirm. It returns to RUN measuring mode.
(If you press MD key, it proceeds to next without saving. If you press C key, it returns to RUN mode.)

◆ USB connector corresponding serial output method

○ Preparation (PC)

① Install the driver to your PC.

※ Driver is enclosed in communication cable No.584 (CTB2-G → PC).

② Provide setting for PC port and communication format.

○ Preparation (CTB2-G)

③ Select "PC" and "8 bit" for communication settings, and select appropriate baud rate.
Refer to Page 17 "10. Various Settings".

○ Communication (PC ↔ CTB2-G)

④ Connect the communication cable.

⑤ Start-up the communication software.

Note) You must activate the software after connecting the cable for successful communication.

Note) It is not possible to connect more than 1 unit of CTB2-G to the same PC.

○ Data output (CTB2-G)

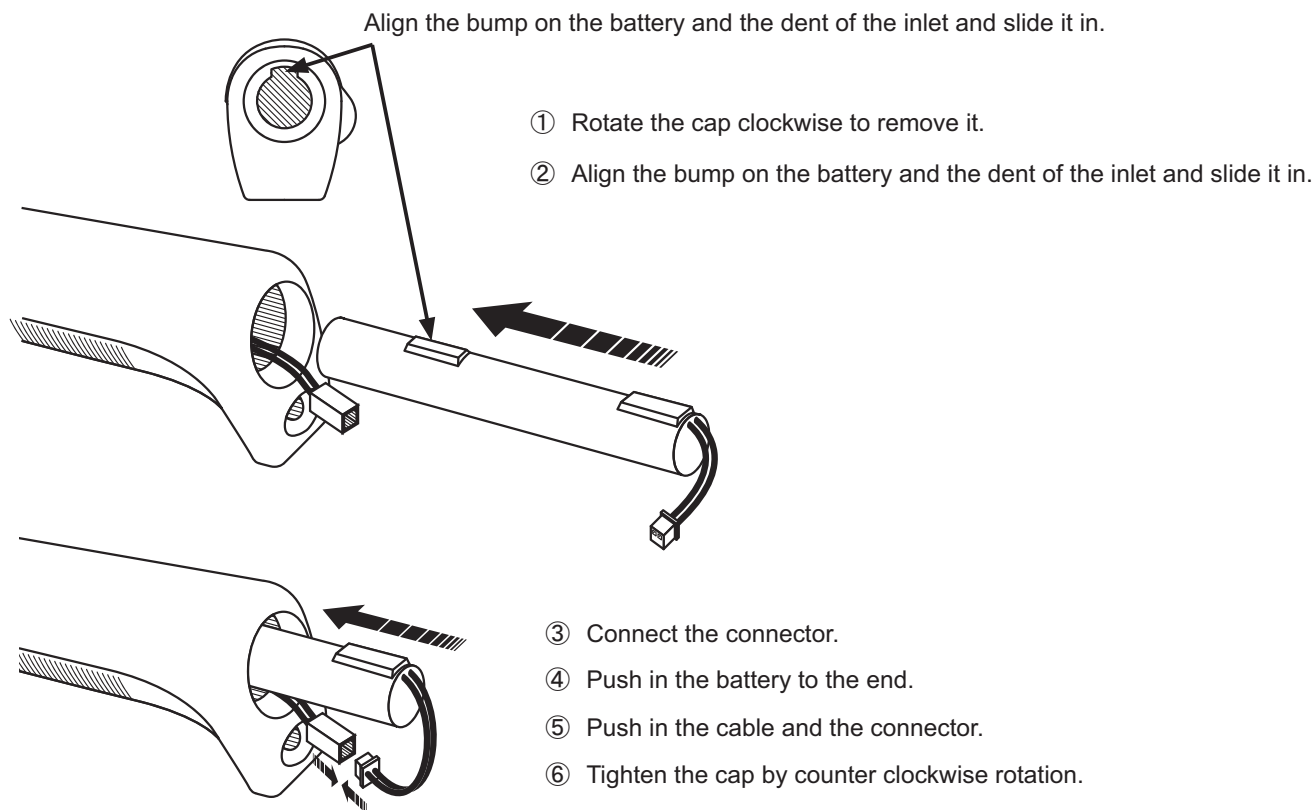
- 1 data : After measurement, press MEM key to output the data.
Refer to Page 14 "8- ④ Transfer measured data to external device".
- Output all data at one time
Refer to Page 14 "8- ④ Transfer measured data to external device".

11. Battery

Battery life

- It can be recharged 500 times on average before it is worn out (depending on usage condition).
- If it gets old, replace them with new battery pack (BP-5).
- Battery may be empty at the time of delivery. Please recharge the battery with the recharger BC-3-100, or BC-3-200 before use.

How to set the battery



※ Be careful not to get the cables tangled when you push in the battery.

12. Charging

Connect charging jack of CTB2-G to the plug of exclusive charger (BC-3-100, BC-3-200). At that time confirm if outlet of charger is connected. When charging finishes, charging completion lamp of charger (green) turns on. (If battery is empty, it will take approx. 3.5 hours to charge.)

※ Battery charger QC-1 or QC-2 for the old CTB cannot be used for CTB2.

Plug of CTB2-G charger (BC-3-100, BC-3-200) is creamy color.

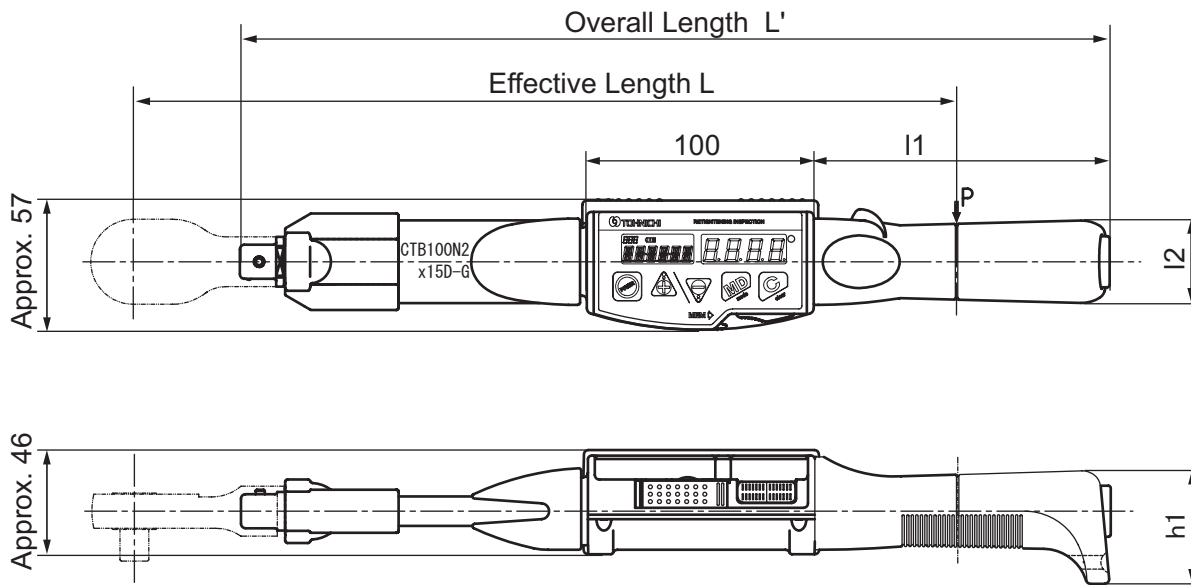
Plug of CTB charger (QC-1, QC-2) is black color.

⚠ Warnings

- ① Use electric power of charger as surely indicated voltage on the plate.
- ② Over charging will make life of battery shorter. Stop to charge soon if completion lamp of charger turns on.
- ③ This torque wrench can not be used when charger is connected.
- ④ If error happens, completion lamp (green) of charger turns on, and charging lamp (red). Stop charging immediately and contact TOHNICHI or your nearest distributors.
- ⑤ Charging must be done in the temperature between 0 – 40 degree C.
- ⑥ If on usage strange smell or unusual heat is felt, stop to use immediately, move the torque wrench to safety place, and contact TOHNICHI.
- ⑦ If the torque wrench is not used for a long time, after charging take out battery from the torque wrench and keep it. Still give a charge at least a half year.

※ After charging reset of CPU works automatically, and no need to push the reset switch.

13. Specifications



Model	Torque Range									
	N·m		kgf·cm		kgf·m		lbf·in		lbf·ft	
	Min.-Max.	1digit	Min.-Max.	1digit	Min.-Max.	1digit	Min.-Max.	1digit	Min.-Max.	1digit
CTB10N2X8D-G	2-10	0.01	20-100	0.1	0.2-1	0.001	20-90	0.1	1.5-7.3	0.01
CTB20N2X10D-G	4-20	0.02	40-200	0.2	0.4-2	0.002	36-180	0.2	3-14.5	0.02
CTB50N2X12D-G	10-50	0.05	100-500	0.5	1-5	0.005	100-440	0.5	7.5-36	0.05
CTB100N2X15D-G	20-100	0.1	200-1000	1	2-10	0.01	200-880	1	15-73	0.1
CTB200N2X19D-G	40-200	0.2	400-2000	2	4-20	0.02	360-1700	2	30-150	0.2
CTB360N2X22D-G	72-360	0.4	720-3600	4	7.2-36	0.04	650-3100	4	52-260	0.4
CTB500N2X22D-G	100-500	0.5	1000-5000	5	10-50	0.05	890-4400	5	73-360	0.5
CTB850N2X32D-G	170-850	1	-	-	17-85	0.1	-	-	124-620	1

Model	Dimension					Weight [kg]	Accessory Provided	Interchangeable Heads
	L	L'	l1	l2	h1			
	[mm]	[mm]	[mm]	[mm]	[mm]			
CTB10N2X8D-G	208	212	63.5	35.6	49.5	0.46	QH8D	(SH,RH,QH,HH)8D
CTB20N2X10D-G	217	214				0.47	QH10D	(SH(-N),RH,QH,DH,HH)10D
CTB50N2X12D-G	254	282				0.58	QH12D	(SH,RH,QH,RQH,DH,HH)12D
CTB100N2X15D-G	363	384	130	36.4	59	0.63	QH15D	(SH,RH,QH,RQH,DH,HH)15D
CTB200N2X19D-G	467	475				0.78	QH19D	(SH,RH,QH,RQH,DH,HH)19D
CTB360N2X22D-G	722	713				1.13	QH22D	(SH,RH,QH,RQH,DH,HH)22D
CTB500N2X22D-G	910	949	230	30	46	4.00	Battery pack (BP-5) Charger	(SH,RH,QH,RQH,DH,HH)32D
CTB850N2X32D-G	1398	1387				5.14		

Torque Accuracy	±1%
Measurement Directions	CW and CCW
Display	7 Segments LED 4 Figures
	14 Segments LCD 6 Figures
	7 Segments LCD 4 Figures
Character Height	Blue, Red LED
	7 Segments LED 10mm
	14 Segments LCD 7mm
Data Memory	7 Segments LCD 3mm
	999 (99 in M 99 mode)
Basic Functions	Peak Hold
	Measurement Time Display
	Auto Memory, Reset
	Judgement
	Auto Zero
	Auto Power Off (3min./10min./30min./None)
	Over Torque Alarm
Communication Functions	Clock
	RS232C Compliant (2400-19200bps)
Battery Display	USB Connector Serial Output
Power Source	4 Steps
Continuous Usage	Nickel Hydrogen Battery Exclusive Pack
Charging Time	Approx. 20 Hours (Approx. 8 Hours)
Operating Condition	Approx. 3.5 Hours (1 Hour Charge)
	Temperature 0~40 Celsius (No Condensation)

14. Error Message

Error message will appear in malfunction of Auto Zero function activated by C key. In addition, the key check function and angle speed check function will be activated when POWER key is pressed at OFF condition, or when Reset switch is pressed.

- Err0 :Error occurred at angle sensor.
- Err1 :Appears when power key or reset switch is turned on while ▲ key is pressed.
- Err2 :Appears when power key or reset switch is turned on while ▼ key is pressed.
- Err3 :Appears when power key or reset switch is turned on while MEM key is pressed.
- Err4 :Appears when power key or reset switch is turned on while C key is pressed.
- Err5 :Appears when power key or reset switch is turned on while MD key is pressed.
- Err8 :Error occurred at data memory.
- Err9 :Error occurred at torque sensor or circuit board
- E-1 : Appears when inappropriate measuring method is applied.
- E-3 : Appears when excessive torque (105% or more of capacity torque) is applied.
- E-4 : Appears when the measured value is abnormal

《Err0》

Error occurred on angle speed detection.

◎ Turn off the power once. Put it still and turn the power on again.

- If Error disappears, error is removed.
- If Error message remains on the display, contact your nearest distributor or TOHNICHI for repair.

《Err1 ~ 5》

Error occurred on membrane switch.

◎ Turn off the power once. Set it still and turn the power on again.

- If Err disappears, error is removed.
- If Err message remains on the display, contact your nearest distributor or TOHNICHI for repair.

《Err8》

Error occurred in the data memory

- Contact TOHNICHI for repair.

《Err9》

Error occurred on the circuit board.

◎ Press C key at no load condition.

- If Err9 disappears, it can be used.
- If Err9 remains on the display, contact your nearest distributor or TOHNICHI for repair.

《E-1》

Error on measuring method. Refer to Page 25 "15. Points to Remember in Measurement".

- Press C key or MEM key and try measurement again.

《E-3》

Excessive torque was applied (over 105% of the max capacity torque).

- Press C key and try measurement again.

《E-4》

Measured value is abnormal. It appears when the measured value is beyond the capacity torque or negative value.

- The tightening application itself may be moving while re-tightening operation. Check if the application is securely fixed and try measurement again.

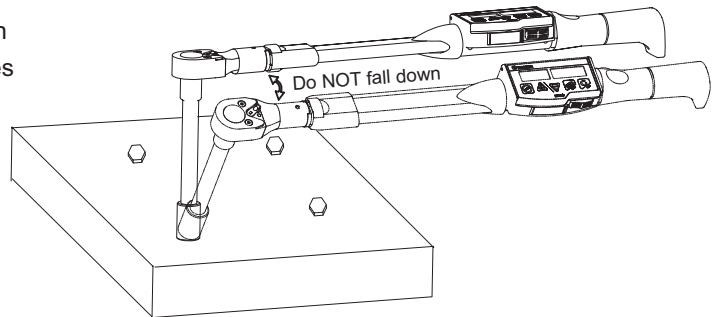
15. Points to Remember in Measurement

- Choose the appropriate mode for the tightening condition.

If you are using CTB2-G for a long bolt or long sockets of twist nature such as hex socket, it may result in an error value (very small torque value). In such case, please change the setting from "NORMAL" mode (default) to "LONG" mode and try the measurement again.

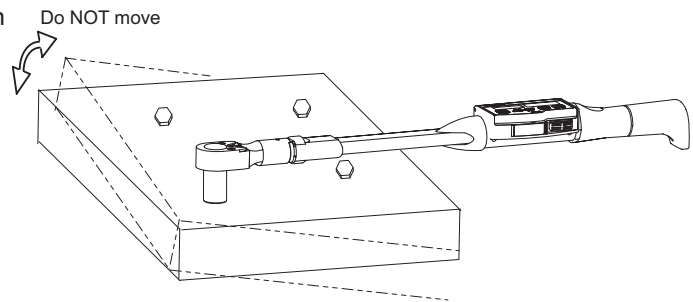
- Make sure that you hold the torque wrench level.

If the torque wrench is tilted, it may cause miscalculation of bolt rotation. Make sure you hold it level so that it does not tilt.



- Fix the tightening application securely.

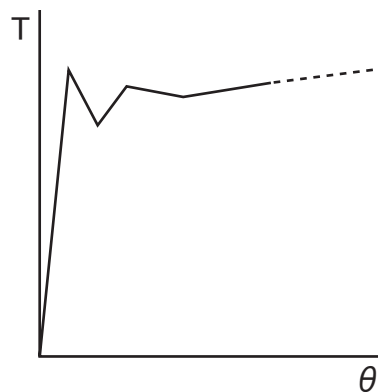
CTB2-G is using the torque and angle increase to figure out the value. If the application itself moves, it may affect the accurate calculation and result in displaying an abnormal value.



- Retighten a bolt further till buzzer sounds and the blue LED turns on.

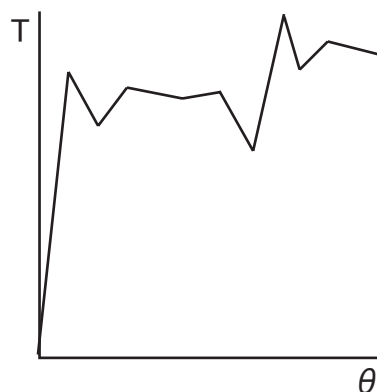
If the collected data is not enough for computing, the measurement point can not be determined. "E-1" error message and peak hold value alternatively start flashing in the display. Tighten a bolt further till buzzer sounds and the blue LED turns on.

Press C key to measure again.



- Apply a smooth and steady hand force to the torque wrench till the buzzer sounds and the blue LED turns on.

If retightening is stopped during measurement, accurate result may not be achieved due to subtle change of the static friction.



16. Optional Accessories

① Battery Pack (BP-5)



BP-5

② Quick Charger (100V - 240V) (BC-3-G)



BC-3-G

③ Interchangeable Head
(SH,RH,QH,RQH,DH,HH,FH)
※ PH (Pipe Wrench Head) can not be used.

④ Communication Cable

- CTB2 - EPP16M3 (D-SUB9pin female) (Catalogue No. 575)
- CTB2 - PC (D-SUB9pin female) (Catalogue No. 575)
- CTB2 - PC (USB Atype) (Catalogue No. 584)



Catalogue No. 575



Catalogue No. 584

⑤ Tohnichi Original Printer (EPP16M3)



EPP16M3

※ The battery pack, the battery charger and the communication cable dedicated for previous model "CTB" are not compliant with those of CTB2-G.
(interchangeable head and the dedicated printer are compatible)

Designs and specifications are subject to change without notice.



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