

DIGITAL TORQUE WRENCH

MODEL **CTB**

OPERATING INSTRUCTIONS



Your Torque Partner  **TOHNICHI**

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INTRODUCTION

In order to use the digital wrench model CTB properly and safely please read this manual before operation. If there are any questions, please contact Tohnichi distributor or Tohnichi. Keep this operating manual for future use.

WARNING

① **Use only Tohnichi charger and battery.**

Never attempt to use any other charger or battery.

② **Use the battery charger with the required voltage indicated on the specification label.**

This may result in overheating or fire.

Charge the battery within a temperature range of 0~40°C.

This may result in bursting or fire.

Recharge the battery where the ventilation is good. Do not cover the charger or battery with clothes.

This may result in bursting or fire.

When not in use, disconnect the plug from the power source.

If not, this may result in short circuit or fire.

③ **Do not use the charger or battery in the rain or in very humid or wet conditions.**

This may result in electric shock or fuming.

Do not use or charge the battery where flammable liquid or gas is used.

This may result in a possible explosion or fire.

④ **Use Tohnichi standard and optional accessories.**

If not, this may result in an accident or injury.

⑤ **Do not throw the battery into fire.**

This may result in bursting or environmental hazard.

NOTES:

- ① Use only Tohnichi AC adapter.
- ② Use the power source with the required voltage indicated on the specification label.
- ③ Do not give any shock or vibration to the Digital Wrench.
- ④ Use the Digital Wrench only under the proper environment described in the operating manual.
- ⑤ Verify the setting of the Digital Wrench before operation.
- ⑥ Do not expose the Digital Wrench to water or oil. It will result in a possible breakdown or cause fire damage.
- ⑦ Do not drop or hit the Digital Wrench. It will result in damage to the Digital Wrench and may cause a breakdown.
- ⑧ Do not use the Digital Wrench beyond the specified maximum measuring range.
- ⑨ Perform regular inspection for function and accuracy.
- ⑩ Make sure that the display shows zero before operation.

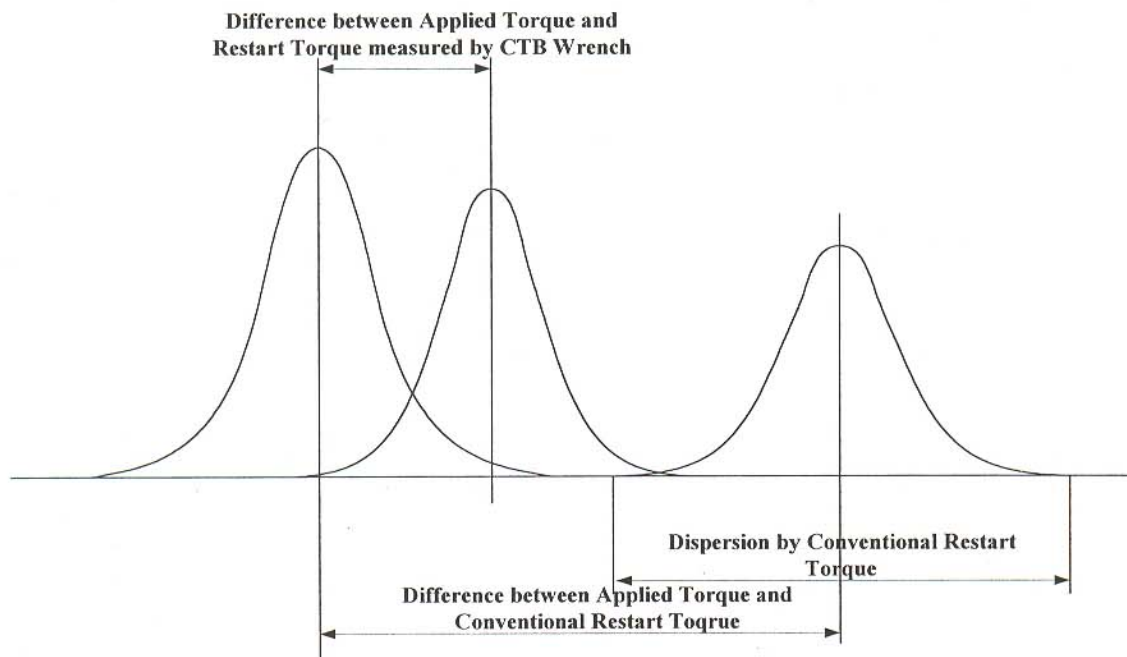
Stop operation immediately if you notice a burning odor or any other sign of fire. Do not use the Digital Wrench any more and immediately contact a Tohnichi sales office or your nearest Tohnichi distributor.

1. OUTLINE

This digital wrench with built-in angle sensor and torque sensor is designed for visually determining the exact applied torque by tightening a bolt further and easily verifies the applied torque.

Features:

- Easy to verify the applied torque values.
- No personal error in measured values.
- Shortens measurement time.
- Small dispersion in measured data.

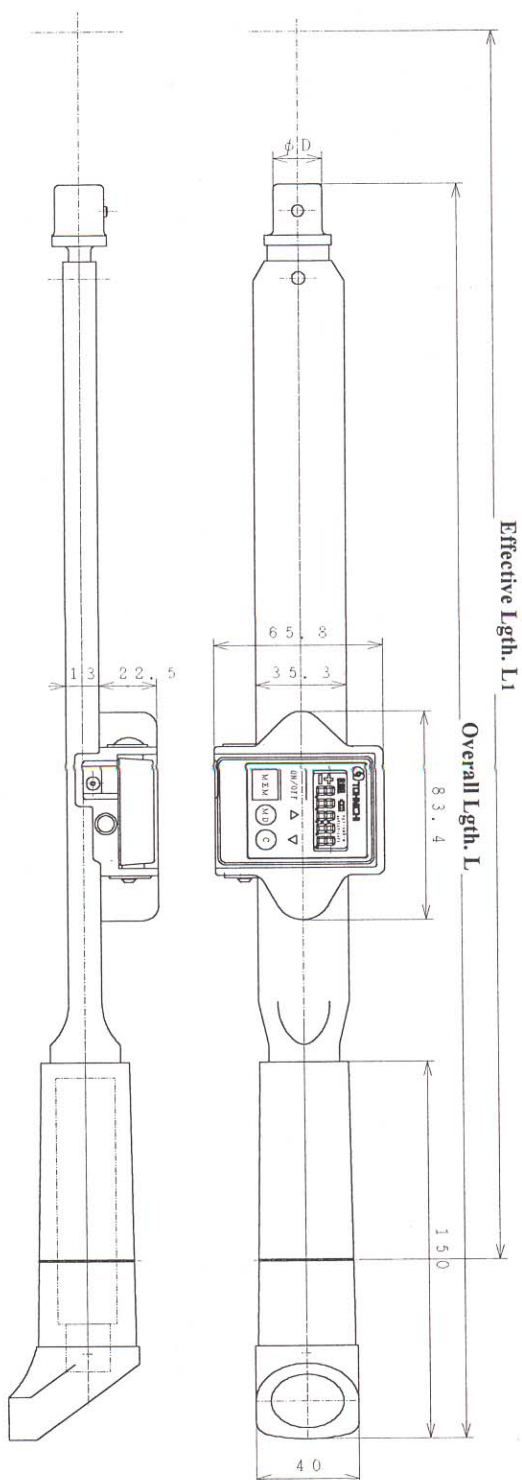


2. STANDARD CONSTRUCTION

- 1) Digital Wrench
- 2) Battery Charger (QC-1)
- 3) Battery (BP-3R)
- 4) Operating manual

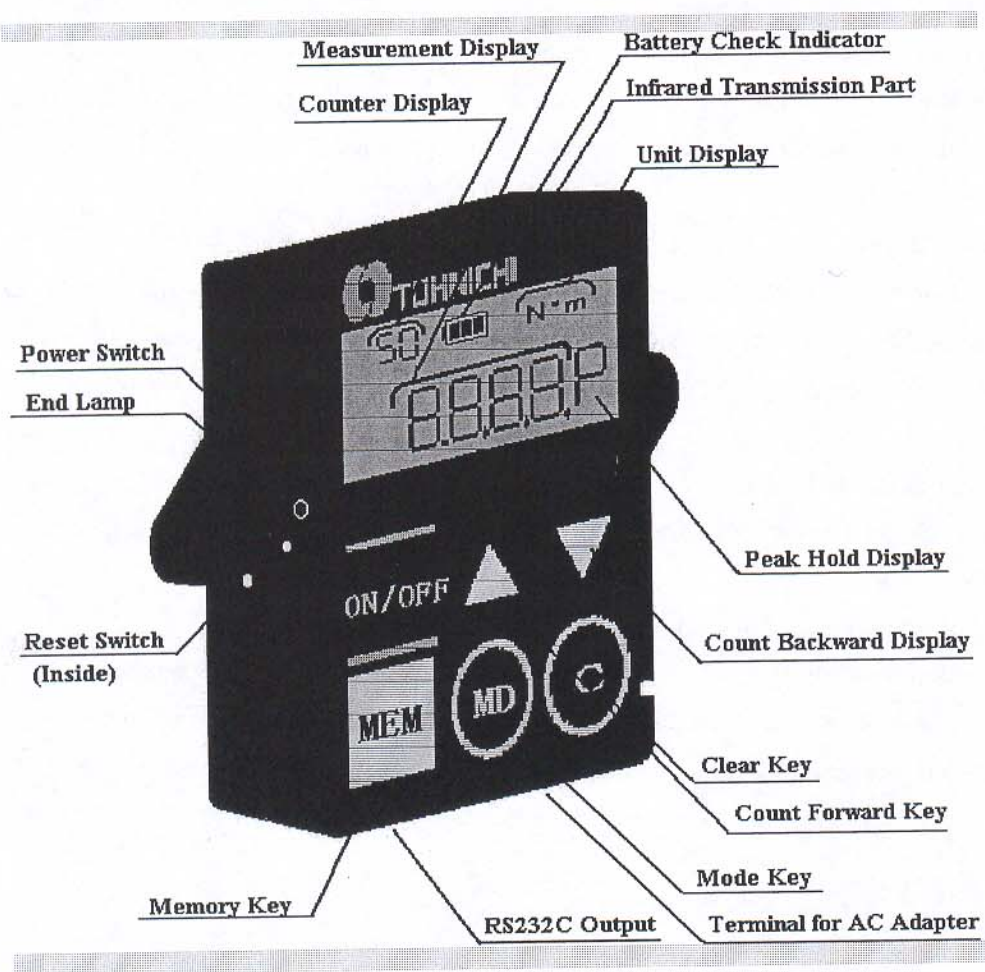
3. SPECIFICATIONS

MODEL	CTB50NX12D	CTB100NX15D	CTB200NX19D	CTB360NX22D
GUARANTEED ACCURACY RANGE	10~50 N.m	20~100 N.m	40~200 N.m	72~360 N.m
RESOLUTION (TORQUE)	0.05 N·m	0.1 N·m	0.2 N·m	0.4 N·m
DIRECTION	Clockwise only			
MASS	0.7 kg	0.8 kg	1.1 kg	1.6 kg
TORQUE ACCURACY	$\pm 1\% + 1\text{digit}$			
DISPLAY	TN Reflection Type Liquid Crystal Display Counter Value 2 Figures (Height 3 mm) Torque Value 4 Figures (Height 7 mm)			
MEASUREMENT MODE	PEAK/RUN (Peak hold function starts from 10 % of maximum capacity.)			
DATA MEMORY	Torque 50 data			
DATA OUTPUT	RS 232C Infrared			
OTHER FUNCTIONS	Automatic Zero, Automatic Memory, Automatic Power Off (Approx. 20 Minutes), Battery Residual Display			
POWER	Ni-Cd (BP-3R)			
RECHARGING TIME	Approx. 1 Hour			
CONTINUOUS OPERATION	8 Hours			
OPERATING ENVIRONMENT	Temperature 0~40°C Moisture Below 85 % (No Bedewing)			
STANDARD ACCESSORIES	QH, BP-3, QC-1 (each 1 Piece)			



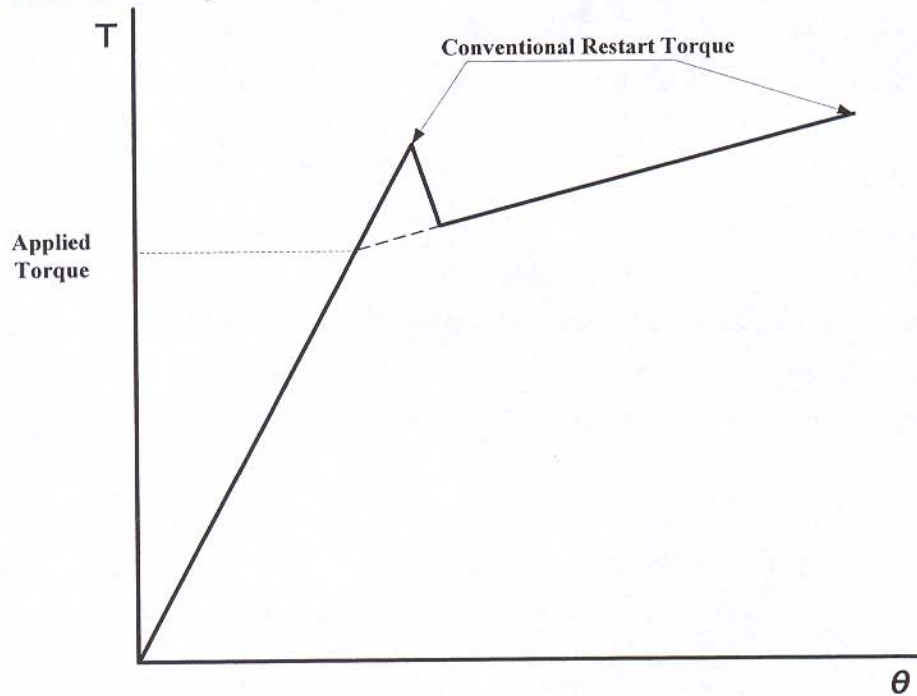
Model	Effective Length L ₁ (mm)	Overall Length L (mm)
CTB50NX12D	319	360
CTB100NX15D	409	433
CTB180NX19D	489	500
CTB360NX22D	749	743

4. EXTERNAL VIEW

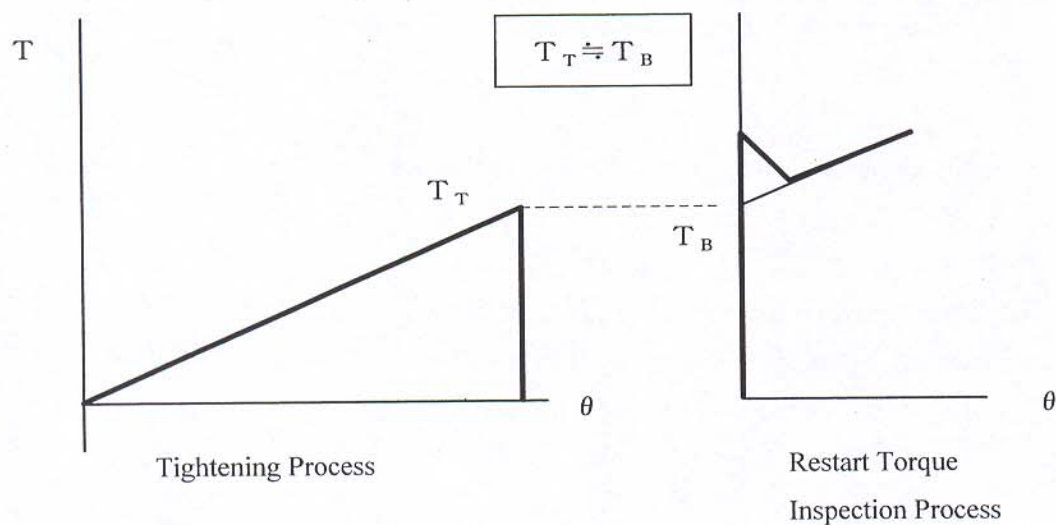


Concept on Restart Torque

Conventional Restart Torque Method



Restart Torque Method by CTB Model



Concept on Restart Torque

If the restart torque line is extended to $\theta = 0$, the hit point is approximate value to the applied torque.

Over Torque Alarm

If the applying torque exceeds the guaranteed maximum torque, the display starts flashing and the buzzer sounds.

End Lamp and Buzzer

When the tightening is completed, the lamp is lit and the buzzer sounds.

Data Memory**Automatic Memory**

Measured data is saved and in 0.5- 5.0 seconds later (available for setting every 0.5 second interval) one counter value automatically advances for next measurement.

Manual Memory

Measured data is saved by pressing "MEM" key. (Maximum 50 data.)

Sampling Number (n)

Sampling number from "1" to last count number is displayed.

Maximum Value (HI)

A maximum value among stored data from "1" to last count number is displayed.

Minimum Value (LO)

A minimum value among stored data from last count number is displayed.

Average Value (--)

An average value among stored data from "1" to last count number is displayed.

Automatic Power Off

If measurement or key operation is not executed for approximately twenty minutes, the power is automatically turned off. And also, if key operation is not executed for one minute in battery alarm condition, the power is automatically turned off.

Over Torque Alarm

If the applying torque exceeds the guaranteed maximum torque, the display starts flashing and the buzzer sounds.

End Lamp and Buzzer

When the tightening is completed, the lamp is lit and the buzzer sounds.

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Minimum Value (LO)

A minimum value among stored data from last count number is displayed.

Average Value (--)




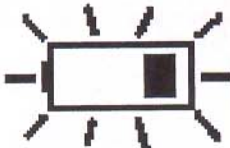
An average value among stored data from "1" to last count number is displayed.

Automatic Power Off

If measurement or key operation is not executed for approximately twenty minutes, the power is automatically turned off. And also, if key operation is not executed for one minute in battery alarm condition, the power is automatically turned off.

Battery Check Display

Battery residual amount is displayed as follows:

Battery Condition	Residual Amount	Action
	Approx. 8 hours operation available.	None
	Battery residual amount is half.	None
	Only 30 minutes operation available	Prepare for recharging. Transmit the stored data to other recorder.
	Operation no longer available, but still able to transmit data.	Transmit the store data within 3 minutes and recharge the battery.

Data Transmission

RS232C Output

Stored data can be transmitted with Tohnichi cable connected to printer or PC.

Infrared Output

Stored data can be transmitted to printer or PC through the transmitter model R-DT100-3.

Error Message

- Err 0 --- Zero adjustment (angle) not possible.
- E-1 --- Program ended before measurement completion.
- E-2 --- Abnormal restart torque measurement.
- Err 6 --- Angle sensor abnormal
- Err 9 --- Torque sensor abnormal or no torque adjustment to zero.

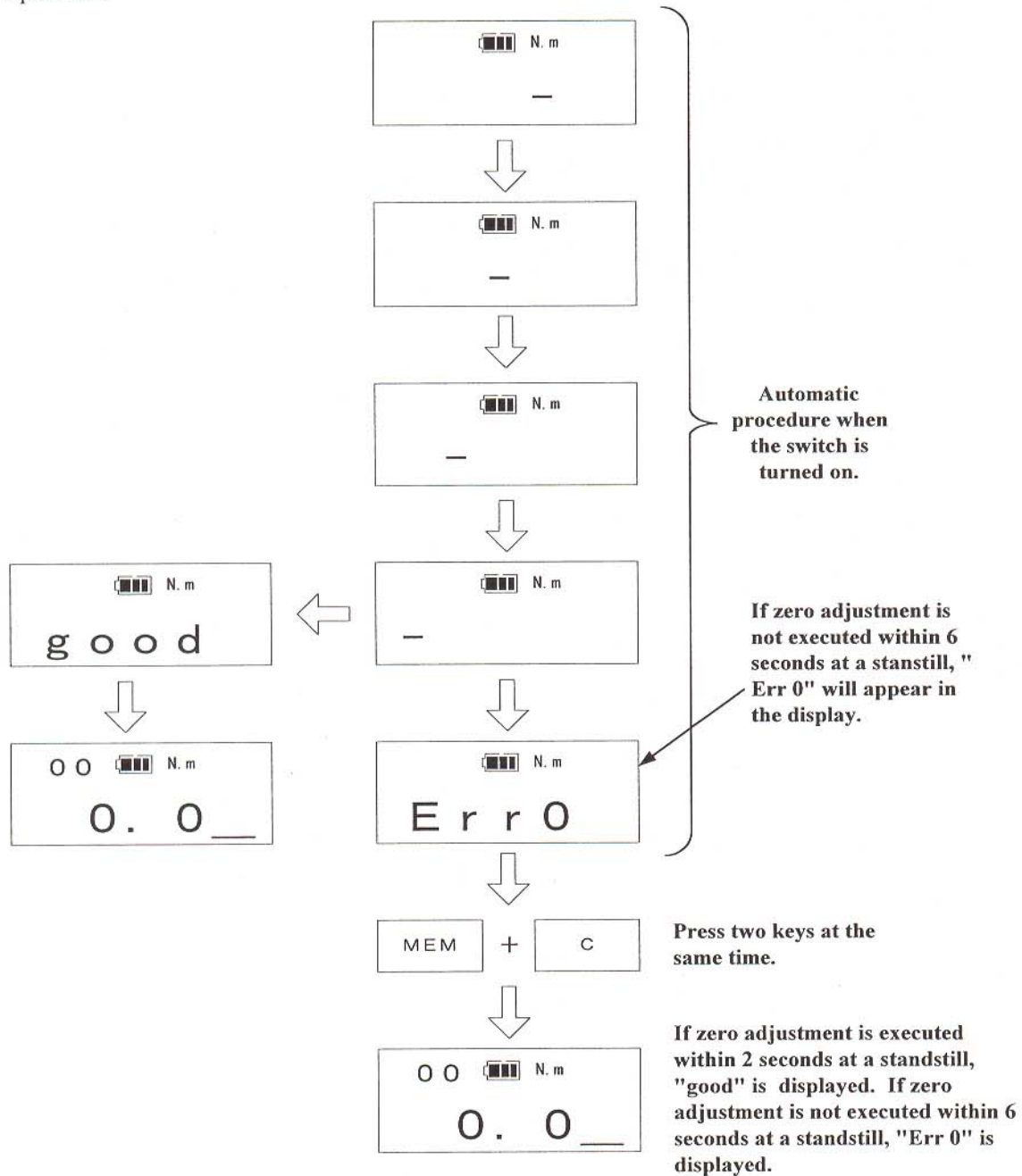
Alarm Buzzer

Alarm buzzer sounds when “E-1” or “E-2” is displayed.

5-2 Operation

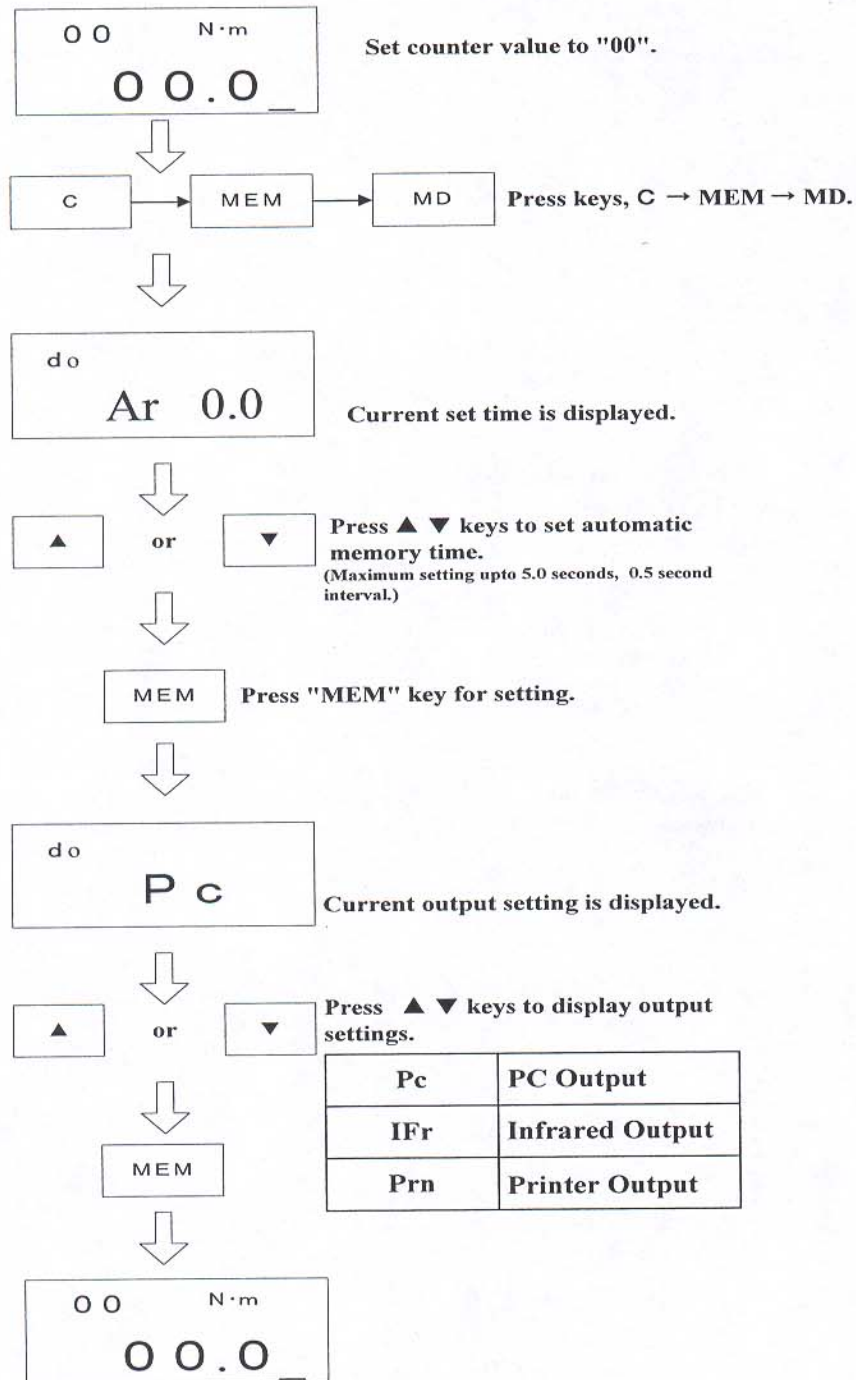
Zero Adjustment

If error message appears in the display when the power switch is turned on, adjust to zero by key operation.

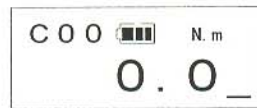


Continuos Setting

When automatic memory and output is continuously set, move counter value.



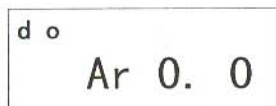
Automatic Memory Setting



Move counter value to "00".



Press keys, C → MEM → MD.



Current setting time is displayed.



Or



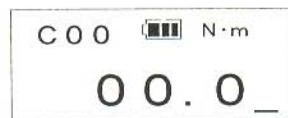
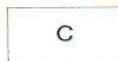
Display automatic memory time by pressing ▲ ▼ keys.
(Maximum setting upto 5.0 seconds , at every 0.5 second interval.)



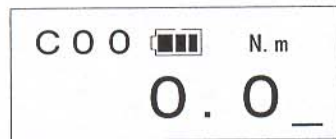
Press "MEM" key for setting.



Or



Output Setting



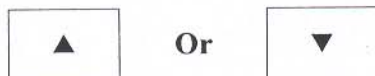
Move counter value to "00".



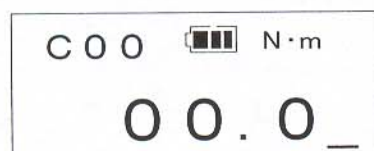
Press keys, C → MEM → MD.



Current output setting is displayed.



Select output by pressing ▲ ▼ keys.



P c	PC Output
IFr	Infrared Output
Prn	Printer Output

Data Sampling

① Run Mode

Move counter value to “00” by pressing ▼▲ keys.

② Peak Hold Mode

Move counter value to “1~50” or “1~99” by pressing ▼▲ keys.

Sampling Number (n)

In measurement mode display the last counter value by pressing ▼▲ keys and press “MD” key to display the sampling number. To bring back to measurement mode from sampling number (n) display mode, press “C” key.

Maximum Value (HI)

In measurement mode display the last counter value by pressing ▼▲ keys and press “MD” key twice. To bring back to measurement mode from maximum Value (HI) display mode, press “C” key.

Minimum Value (LO)

In measurement mode display the last counter value by pressing ▼▲ keys and press “MD” key triple. To bring back to measurement mode from minimum Value (LO) display mode, press “C” key.

Average Value (—)

In measurement mode display the last counter value by pressing ▼▲ keys and press “MD” key four times. To bring back to measurement mode from average Value (—) display mode, press “C” key.



CAUTION

Stored data up-to the last counter number will be deleted if “MEM” and “C” key are pressed at the same time in sampling number (n), maximum number (HI), minimum value (LO) or average value mode.

Data Deletion

To delete one data

Display a data to be deleted by pressing ▼▲ keys and press “C” key to delete the data.

To Delete all of the Data in Count Value from “1” to the certain number

Display the last counter value to delete by pressing ▼▲ keys and display “n”, “HI”, “LO” or

“- -“ mode by pressing “MD” key. Press “MEM” and “C” keys at the same time to delete all of the data from counter value “1” to the certain number will be deleted and counter value will return to “01”.

To Delete All Stored Data

Display the counter value “50” by pressing ▼▲ keys and display “n”, “HI”, “LO” or “- -“ mode by pressing “MD” key. Press “MEM” and “C” keys at the same time to delete all stored data will be deleted and counter value will return to “01”.

CAUTION

Before data deletion, save the data if necessary.

To replace battery, keep the required data in other equipment.

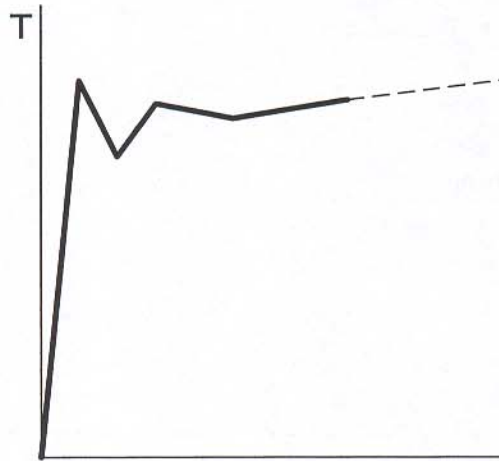
Error Cancellation

Error Code	Cancellation Method
Err 0	Press “C” and “MD” keys at the same time for more than two seconds at a standstill.
E-1	Press “C” or “MEM” key.
E-2	
Err 6	Contact a nearest Tohnichi distributor for service.
Err 9	Press “C” key under unloading condition. If error remains, contact a nearest Tohnichi distributor.

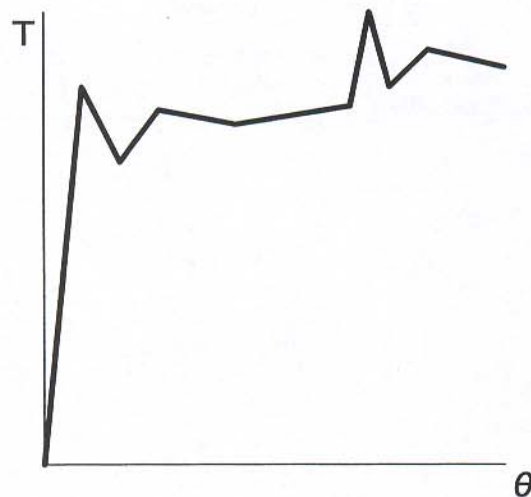
6. MEASUREMENT

Cautions about Measurement

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

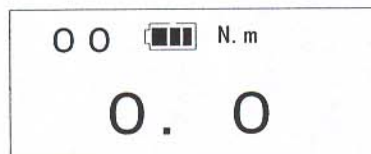


Apply a smooth and steady pull to the Wrench till the buzzer sounds. If the pull is stopped during restart measurement operation, static frictional resistance will influence on precise measurement. “E-2” error message and peak hold value in the display alternatively start flashing.



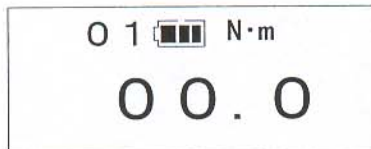
Do not use the long socket which has extremely large torsion during tightening operation. This Digital Wrench judges the rotating movement of a bolt based upon the relation between further tightening angle and torque increase. If the long socket which has large torsion, the buzzer sounds before the bolt rotates.

Measurement

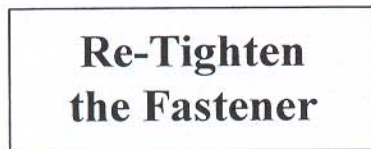


Power On

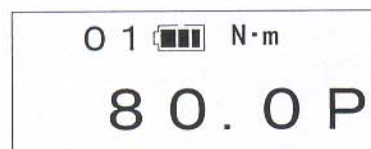
Check battery residual amount before use.



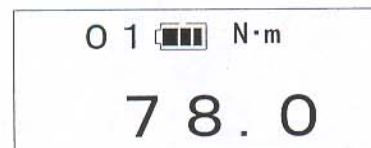
Set the counter value among "01~50" by pressing ▲ ▼ keys. (Peak hold mode)



Apply torque to the fastener with a smooth and steady pull of the Wrench till the buzzer sounds and the lamp is lit. (If re-tightening operation is stopped before sound of the buzzer and lighting the lamp, the peak torque is only displayed.)



After releasing force, the peak torque is displayed for about one second. After that the restart torque is displayed.

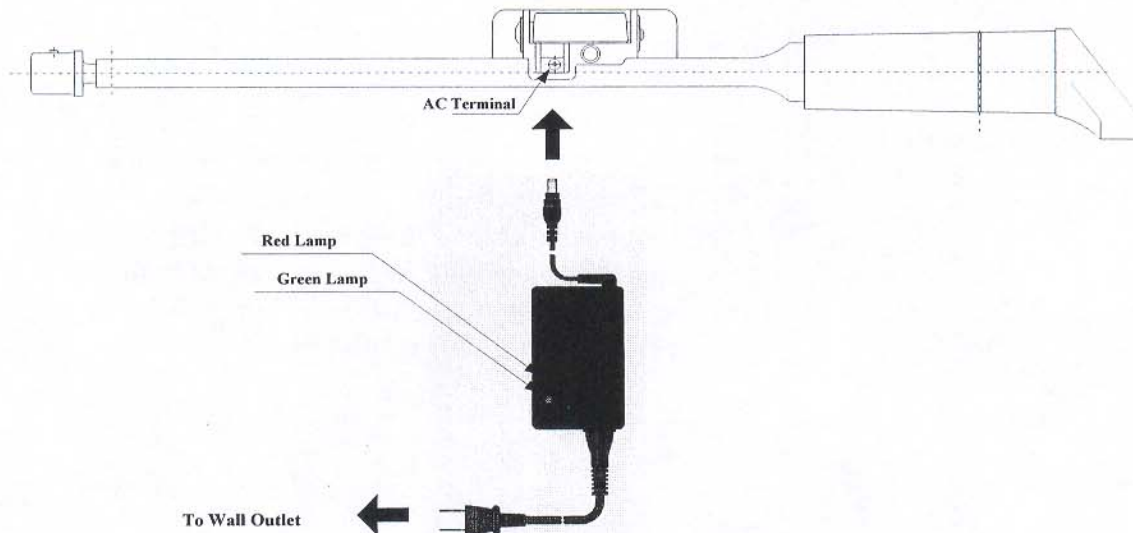


**Save Displayed Value
by Pressing "MEM"
Key.**

Press "C" key if data saving is not necessary. If automatic memory mode is set, data is saved and the counter value automatically advances.

Recharging

1. Insert the jack of the charger into the Digital Wrench.
2. Insert the plug of the charger into the wall outlet.
Charging starts. Charging takes approximately 1 hour.
3. Check the lamps on the charger.
Red lamp ----- On charging
Green lamp ----- Charging is completed.
Red and green lamps ----- Abnormal charging
4. When green lamp is lit, the charging is completed.



CAUTION

Disconnect the AC charger from the wall outlet and the Digital Wrench after charging.

7. OPTINAL ACCESSORIES

- 1) Cable for PC

CTB → NEC 25 Male	Catalog No. 576
→ IBM 25 Female	Catalog No. 577
→ Toshiba 9 Male	Catalog No. 578

- 2) Tohnichi Printer EPP16M2

- 3) Cable for EPP16M2 Printer Catalog No. 381

- 4) Infrared Data Receiver R-DT100-3

- 5) Cable from R-DT100-3 to PC

R-DT100-3 → NEC 25 Male	Catalog No. 552
→ IBM 25 Female	Catalog No. 559
→ Tohshiba 9 Male	Catalog No. 560
→ Tohshiba 9 Female	Catalog No. 561

8. HOW TO USE OPTIONAL ACCESSORIES

8-1 Printing Out Measurement Values (EPP16M2)

Preparation

Connect the Digital Wrench model CTB to the printer through the cable (optional accessory).
Turn on the printer.

Progressive Print Out

To print out data one by one, press "MEM" key. In automatic memory mode, one data is printed after automatic reset.

Continuos Print Out

To print out all the data from the counter value 1 to the required counter value:

- ① Move to the last counter value.
- ② Press "MD" key and show "n" in the counter display.
- ③ Press "▼" key for data transmission.

Press "C" key to return to measurement mode.

Print Format

1 :	13. 0	N · m
2 :	12. 8	N · m
3 :	=====	N · m
4 :	13. 8	N · m
5 :	12. 6	N · m
6 :	13. 0	N · m

n= 5

H1 :	13. 8	N · m
LO :	12. 6	N · m
X :	13. 0	N · m

8-2 Data Transmission to Receiver Model R-DT100-3

Preparation

Connect the R-DT100-3 to PC or Printer through the cable. Turn on the R-DT100-3 and PC or Printer. Place infrared output part toward infrared receiving part of model R-DT100-3.

3. Data transmission distance: within 1 m

Continuos Print Out

To print out all the data from the counter value 1 to the required counter value:

- ① Move to the last counter value.
- ② Press “MD” key and show “n” in the counter display.
- ③ Press “▼” key for data transmission.

Press “C” key to return to measurement mode.

Print Format

1 :	13. 0	N · m
2 :	12. 8	N · m
3 :=====	N	· m
4 :	13. 8	N · m
5 :	12. 6	N · m
6 :	13. 0	N · m

n=	5	
Hl :	13. 8	N · m
LO :	12. 6	N · m
X :	13. 0	N · m

8-3 Data Transmission to PC

Preparation

Connect the Digital Wrench model CTB to the printer through the cable (optional accessory).

Turn on the printer.

Progressive Print Out

To print out data one by one, press “MEM” key. In automatic memory mode, one data is printed after automatic reset.

Continuos Print Out

To print out all the data from the counter value 1 to the required counter value:

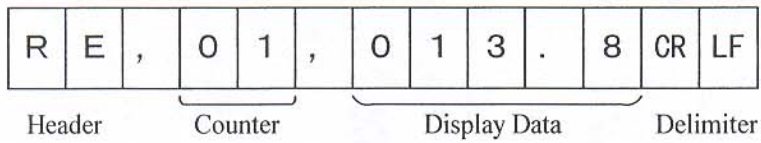
- ① Move to the last counter value.
- ② Press “MD” key and show “n” in the counter display.
- ③ Press “▼” key for data transmission.

Press “C” key to return to measurement mode.

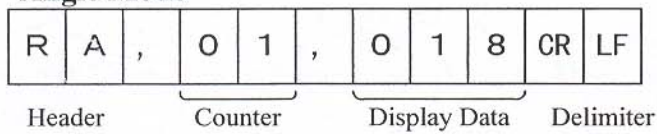
9. ADDITIONAL NOTES

Data Outout Format

Data Form : RS232C
Transmission System : Start-Stop Synchronization Serial
Baud Rate : 2400 bps
Data Length : 7 bit
Stop Bit : 1 bit
Parity : None



Angle Mode



Torque Mode

