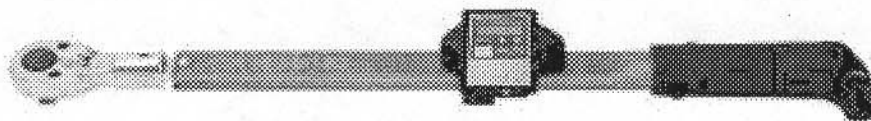


DIGITAL TORQUE & ANGLE WRENCH

Production type

Model CTA-P & CTAE-P

OPERATING MANUAL



To use this product correctly and safely, please read this manual carefully before use. If you have any question about the product, contact your distributor or TOHNICHI MFG. CO., LTD.



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To CUSTMER

In order to use the Digital Torque Wrench, 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. Recharge battery properly.
Use the battery charger with the required voltage indicated on the specification label.
Use of other voltage may result in overheating and/or fire.
Charge the battery within a temperature range of 0 to 40 C degree.
Temperature over 40 C degree may result in bursting and /or fire.
Recharge the battery where the ventilation is good.
Do not cover the charger or battery with clothes.
May result in bursting and/or fire.
When it is not in use, disconnect the plug from the power source.
Keeping plugged may result in electric shock and/or fire.
3. Pay attention around your work place.
Do not use the charger or battery in the rain or in very humid or wet conditions.
Use of the product in wet and damp places may result in electric shock and/or fuming.
Keep work place properly lighted.
Work in dark place may result in accident.
Do not use the torque wrench or battery charger beside flammable liquid or gas in use.
Do not use or charge the battery where flammable liquid or gas is used.
May result in bursting, fire and/or accident.
4. Use only Tohnichi standard or optional accessories.
Use only Tohnichi standard and optional accessories in this manual.
Use of other products may cause accident and/or injury.
5. Do not throw the battery into fire.
May result in bursting and /or leaking of harmful substances.

ATTENTION

1. Keep work place clean.
Littered place and worktable may result in accident.
2. Keep out of children.
Keep out other person from Digital Wrench and /or cord of the charger.
Keep out other person from work place.
3. When it is not in use, keep it in safe place.
Keep it in dry place, keep out from children's reach, and/or keep it in locked. Please do not store the torque wrench and its battery charger in where the temperature will go up beyond 50 degree.
4. Do not use the Digital Wrench forcefully.
The torque wrench should be used efficiently in safe place and must be operated accordingly within applicable torque range. Work in over capacity may result in accident.
5. Use Digital Wrench tool fitted to the work.
Do not use it other than as appointed work.
6. Handle charger cord carefully.
Please be careful with handling the cord of battery charger in use. Do not pull out the cord for unplug purpose or not to carry the battery charger hanging cord itself. Please keep it away from heated, greased or sharpened place. Pay attention, not step on, not to pull out, not to damage by external force during recharging operation.
7. Do not work with excessive position.
Keep feet on the ground and balanced.
8. Maintenance it carefully.
When replacement of attachment, follow this manual. Check up the cord of battery charger periodically. When it is damaged, please ask your Tohnichi distributor or Tohnichi for repair. When you use an extension cord, check it periodically and change it when it is damaged. Keep the grip dry and clean. Do not expose it to oil or grease.
9. Inspect the parts are not damaged.
Needs inspection the case and parts of Digital Wrench. Please check if function is working properly and give you right performance. And also check up condition of each components and its setting. And be sure working condition is good enough for operating. Contact Tohnichi distributor or Tohnichi for repair and replacement of broken case and other parts.

NOTES

- (1) Use Tohnichi AC adapter only.
- (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 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 is designed based on angle tightening method. Tightening torque, tightening angle and number of tightening will be given.

There are functions given such as Snug torque, 1st, 2nd, 3rd tightening angle and number of tightening.

Each data and setting condition would be transferred by original application software.

This wrench will tighten up the required number of bolts, and then judge them each time whether the results were OK.

Otherwise will tighten up continuously to 1st, 2nd and 3rd angle for further judgments. Finally all the data will be transferred to the original software for analyzing.

Cope with NG can be chosen (Reset can be made for all data or only NG).

Tightening torque at the final set angle will be memorized internally at the same time.

Since a gyro-sensor detects the angle, there is no need for any external attachments to determine the angle.

2. STANDARD CONSTRUCTION

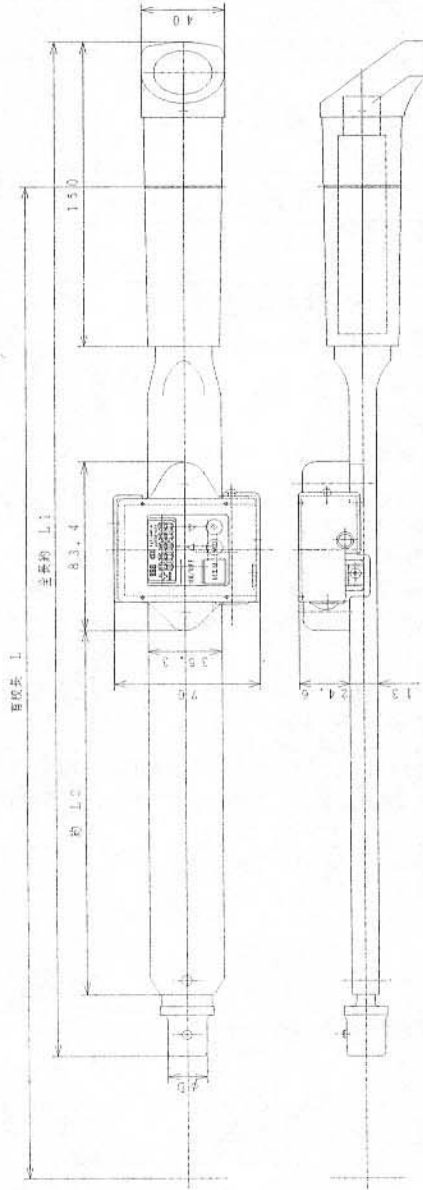
- 1) Digital Angle Wrench
- 2) Battery Charger (QC-1)
- 3) Battery pack (BP-3R)
- 4) Exchangeable head QH(Compatible ratchet head)
- 5) Cable (CTA↔computer)
- 6) Application Soft (CD)
- 7) Operating manual
- 8) Application Soft manual

3. SPECIFICATIONS

I . SPECIFICATIONS

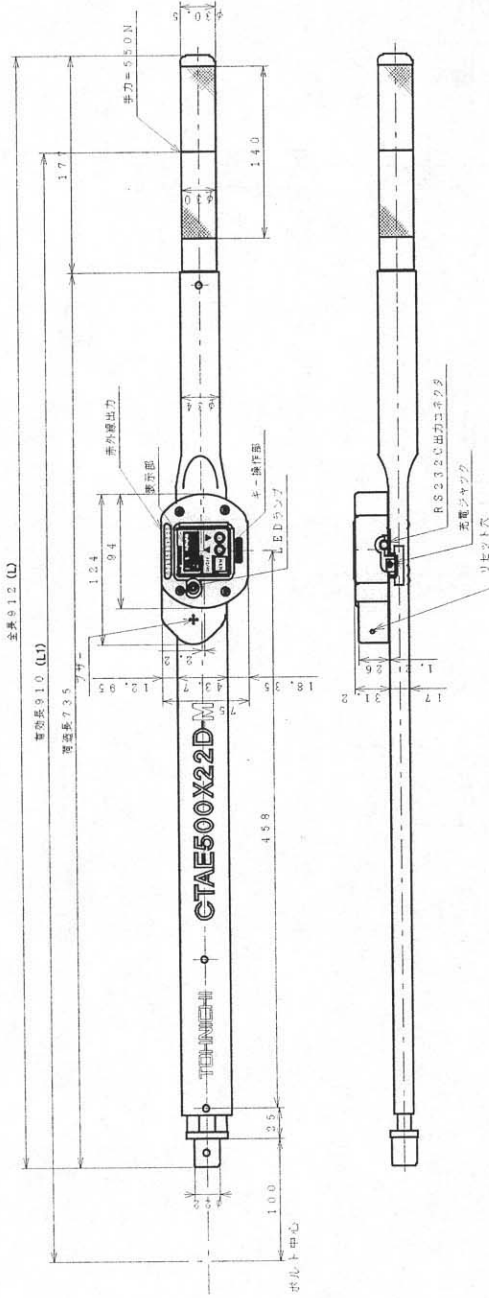
MODEL	CTA50×12D-P	CTA10×15D-P	CTA20×19D-P	CTA36×22D-P	CTAE500 × 22D-P	CTAE850 × 32D-P
GUARANTEED ACCURACY RANGE	(2.5)10~50	(5)20~100	(10)40~200	(18)72~360	(25)100~500	(43)170~850
	() minimum value of Snug torque. Will not guarantee the accuracy of snug torque value at less than minimum torque.					
TORQUE 1digit	0.05N·m	0.1N·m	0.2N·m	0.4N·m	0.5N·m	1N·m
ANGLE DISPLAY RANGE	0~999°					
RESOLUTION (ANGLE) 1digit	1°					
DIRECTION	Clockwise only					
MASS	0.7kg	0.8kg	1.1kg	1.6kg	3.5kg	4.9kg
TORQUE ACCURACY	±1%+1digit					
ANGLE ACCURACY	±2° +1digit (Angular velocity within 30° /s~180° /s when bolt is turned to 90°)					
DISPLAY	TN Reflection Type Liquid Crystal Display Counter Value 2 Figures (Height 3mm) Counter Display 2 Figures (Height 7mm) Torque Value 4 Figures or 3 Figures (Height 7mm) Angle Value 3 Figures (Height 7mm)					
MEASUREMENT MODE	RUN(Angle/Torque)PEAK (Torque Tightening/Angle Tightening) (Peak hold function starts from 2.5% of maximum capacity.)					
DATA MEMORY	Tightening torque value·1 st angle value·2 nd angle value·3 rd angle value·final tightening torque value (final tightening angle torque value) Maximum 20 data for each tightening value (ex.1engin 20 data×5 types=100 data) Note: rewriting number of data memories for 1 data is up to 1,000,000 times..					
DATA OUTPUT	RS232C based...output 1 data at tightening and all data after 1 process					
PARTICULAR SETTING	Snug torque setting·tightening torque setting·tightening torque setting·maximum setting. 1 st , 2 nd , & 3 rd tightening angle setting. 1 st , 2 nd , & 3 rd maximum tightening angle setting·tightening number·auto reset·data output·NG measure					
MEASURING FUNCTION	When it comes to set value, buzzer will go off. It will measure after load release. Condition NG: maximum value < measured data OK: maximum value ≥ measured data ≥ set value OK: buzzer and LED will light(approx.1second) NG: buzzer and LED will blink					
OTHER FUNCTIONS	Auto Reset, Auto Zero, Auto Power Off (Approx. 20 Minutes), Battery Residual Display					
OUTSIDE SIGNAL OUTPUT (OPTION)	Total finish signal output (approx. 0.5 second output) Gauge point capacity (Load Resistance) DC30V 1A AC125V 0.3A					
POWER	Ni-cd (BP-3R)					
CONTINUOUS OPERATION	8 Hours (Recharging Time: Approx. 1 Hour)					
OPERATING ENVIRONMENT	Temperature 0~40°C Moisture Below 85%RH (No Bedewing)					
STANDARD ACCESSORIES	QH, BP-3R, QC-1 (1Piece each)					

CTA50~360-P type

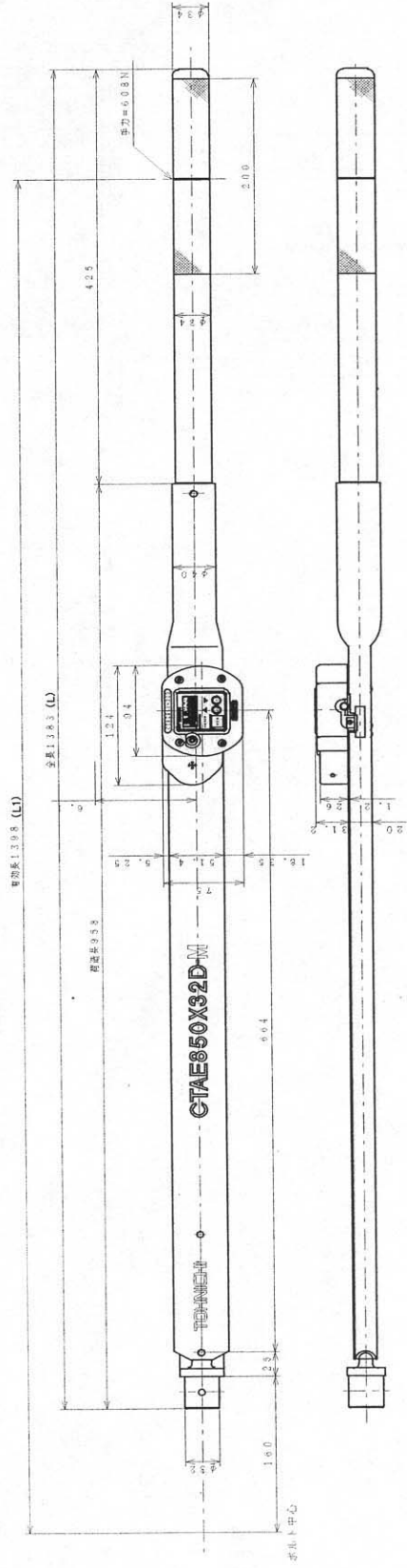


Model	Angle-Measurement area (°)		Angle accuracy	Torque Measurement area (N·m)		Torque accuracy	L1 (mm)	L (mm)	Weight (kg)	Option	
	Minimum~maximum	1 digit		Minimum~maximum	1 digit						
CTA50 x 12D-P			±2° +1 digit (30° /s ~ 180° /s 90° when lotated)	(2.5)10~50	0.05	±1% +1 digit	329	360	0.7	QH12D	
CTA100 x 15D-P				(5)20~100	0.1		409	433	0.8	QH15D	
CTA200 x 19D-P	0~999	1		(10)40~200	0.2		489	500	1.1	QH19D	Quick Charger (QC-1)
CTA360 x 22D-P				(18)72~360	0.4		749	743	1.6	QH22D	
CTAE500 x 22D-P				(25)100~500	0.5		910	912	3.5		
CTAE850 x 32D-P				(43)170~850	1		1398	1383	4.9	QH32D	

CTAE500 × 22D-P

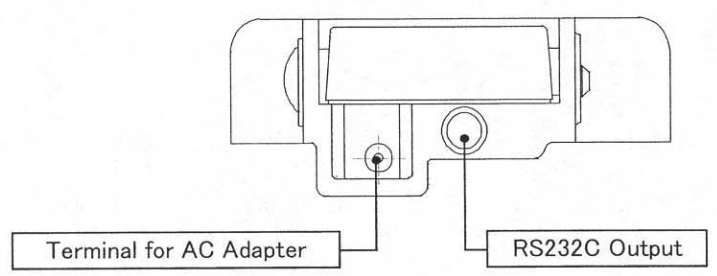
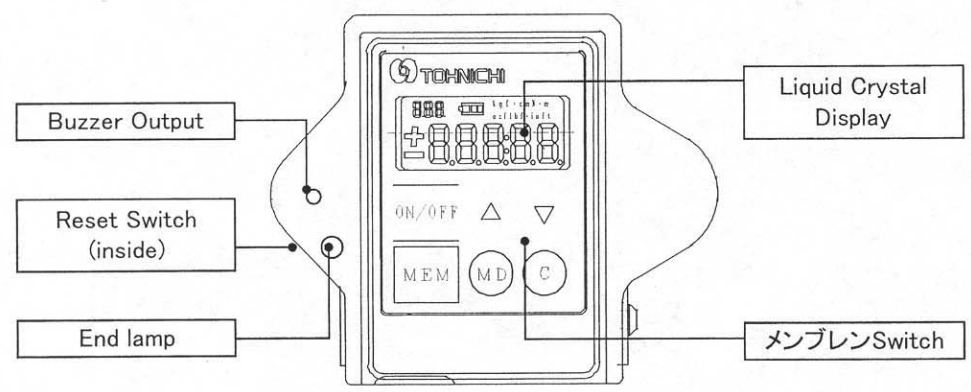


CTAE850 × 32D-P



4. Parts names

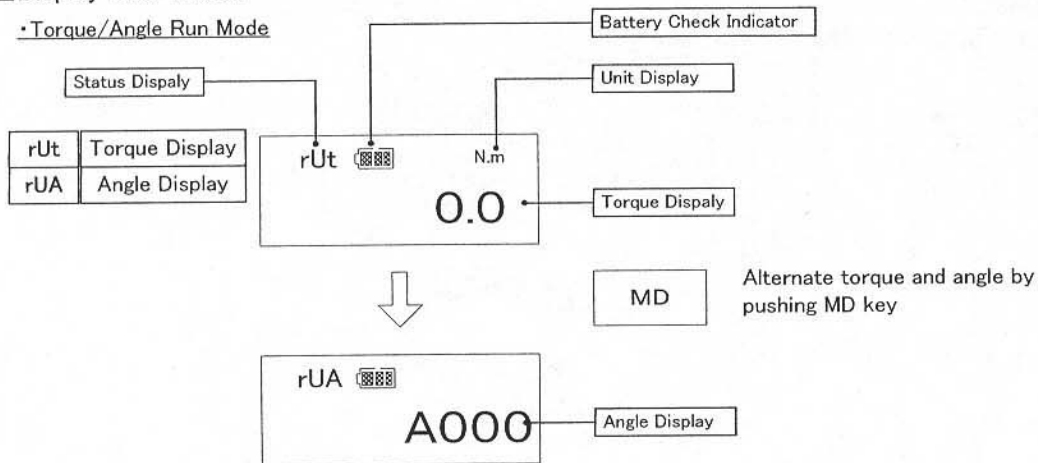
I. Names of display



II. Display after Reset (Run Mode) Angle/Torque Run Mode (Switch Display)

■ Display after Reset

• Torque/Angle Run Mode



■ Key Function



Will not use



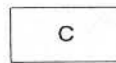
Will not use



Measurement start key (measurement display will appear)



Display switch key

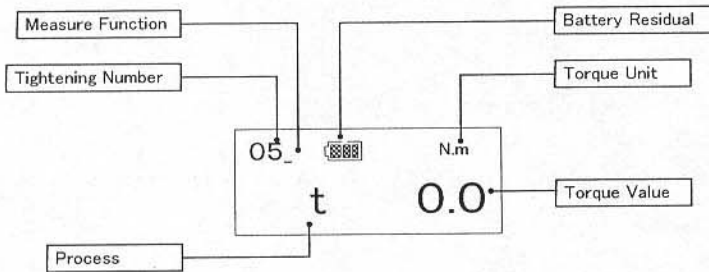


Display Reset, manual zero (only at torque display)
Auto zero function will activated when the angle standstill for 2 seconds.

III. Measure mode display(torque/angle peak display)

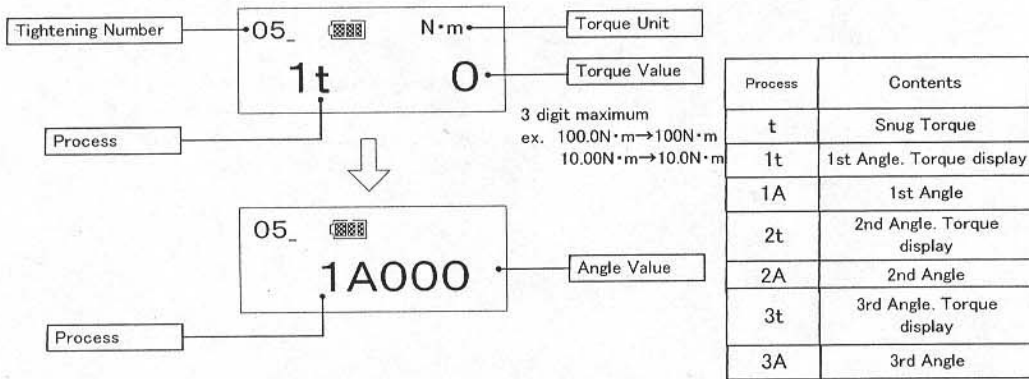
Press the **MEM** key while it is run mode to change display.

■ Measurement Display Torque Tightening Display

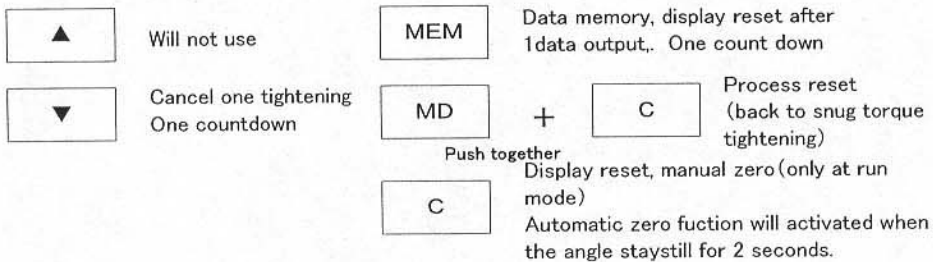


■ 1st, 2nd, 3rd Angle Tightening Display

Torque display remains until snug torque achieved. Display would change into angle afterwards.



■ Key Function



5. Function and operation of key

I. Function

□ **Zero Adjustment (Angle)**

Place the Digital wrench on a flat bench or desk, turn on the power key and leave the digital wrench at a standstill for more than 2 seconds in order to automatically adjust to zero. If "Err 0" appears in the display, the zero adjustment is made by key operation. (Angle zero)

□ **Automatic Zero (Torque)**

In case of residual force remaining after releasing the load, "0" would be shown on the display if its value is bellow than 2%.

If the value is beyond 2%, error message "Err 9" will be displayed.

□ **RUN Mode (Continuous Display)**

After resetting the operation, display would be set as Run-Mode.

When loaded, displayed value will go up and will go back to "0" when it is released. And rotate the wrench at angle run mode; it will display the Angle.

(clock wise only) For angle display reset, press C button or standstill for more than two seconds in order to get Auto zero setting.

□ **Peak Torque (Maximum Torque)**

If the display value exceeds over approximately 2.5% of the maximum capacity, maximum torque value applied remains as Peak torque. If the display value does not exceed approximately 2.5% of the maximum capacity, the display value will return to zero.

□ **Measurement Function**

When it go up to set value, the buzzer will go off and release the load to do measurement.

OK: buzzer and LED will light on for 1 second

NG: buzzer and LED will blink

□ **Snug Torque Setting**

Setting the Torque value to start angle measurement.

□ **Tightening Torque Setting**

Setting of tightening Torque.

□ **Tightening Torque maximum setting**

Setting Maximum Tightening torque

□ **1st (2nd · 3rd) tightening angle setting**

Setting tightening angle from snug torque to 1st, 2nd, and 3rd.

□ **1st (2nd · 3rd) maximum angle setting**

Setting maximum tightening angle from snug torque to 1st, 2nd, and 3rd.

□ **Tightening number setting**

Set the tightening number

□ **Measure time setting**

Measurement time setting value 0.5 ~ 5 seconds.

(Interval can be adjusted freely with 0.5 seconds as minimum digit)

□ **Data Output Method Setting**

Setting data output method (format)

□ **Procedure at NG**

Procedure at NG, Leave the count as it is or start from beginning.

Each setting can be transmitted by original application software from computer.

□ **Over Torque Alarm**

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

□ **Manual Reset**

When automatic function is not used, data reset can be made by pressing C key. And also measured data can be memorize the peak value by pushing MEM key and output RS232C. Then display will reset.




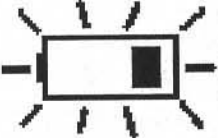
□ **Automatic Power Off**

Power would be turned off unless there is any measurement action either with any key operation for 20 minutes at Applicable condition.

Or power would be turned off without any key operation for a minute at Battery Alarm condition.

□ **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.	Be prepared for recharging. Transmit the stored data to other recorder if necessary.
	Operation no longer available, but still able to transmit data.	Transmit the stored data within 3 minutes and recharge the battery.

□ **Data Transmission**

RS232C(Standard)

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

(See 8 **Data output** application instruction manual)

□ **Error Message**

Err0---Zero adjustment not possible

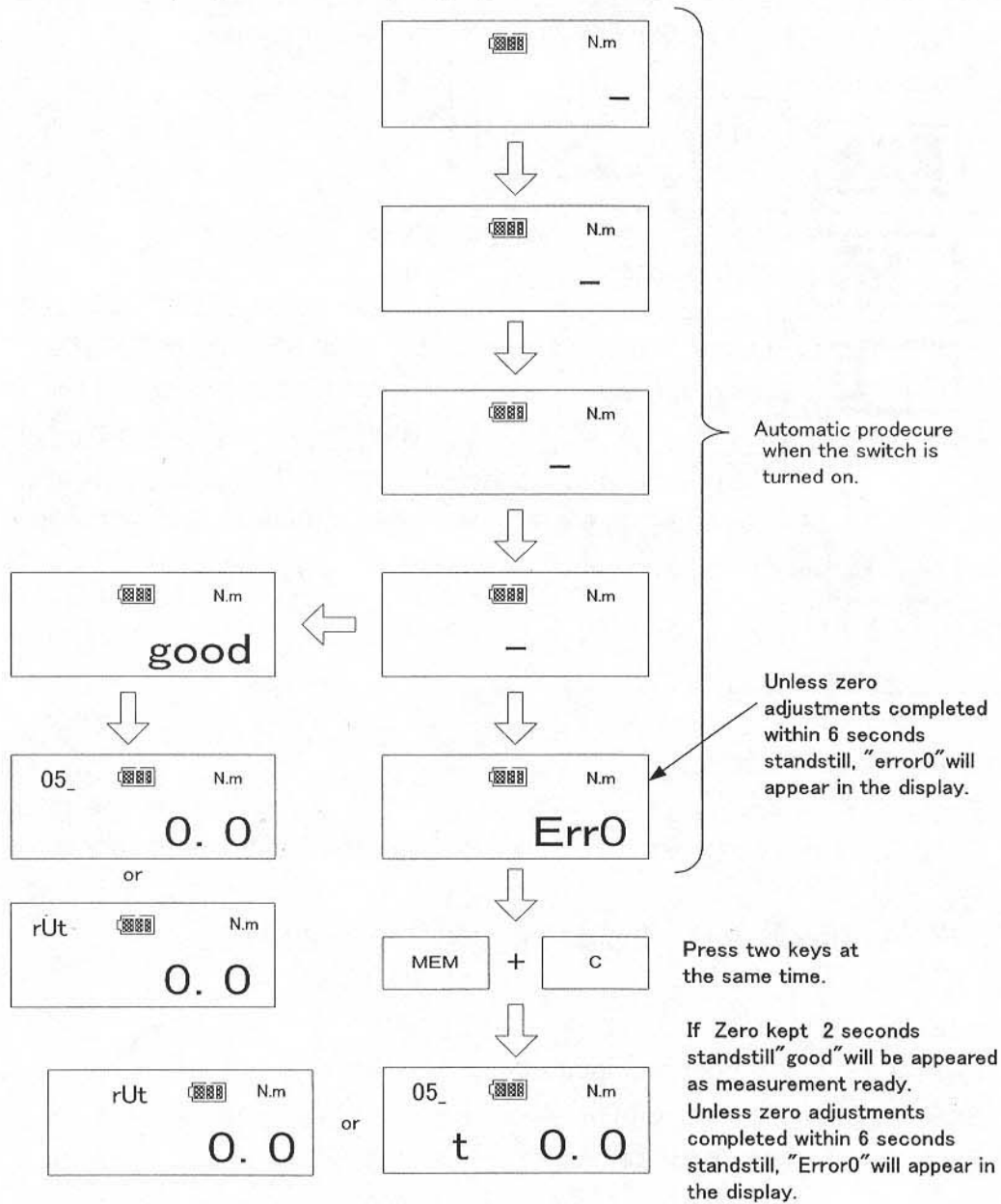
Err6---Angle sensor abnormal

Err9---Torque sensor abnormal

II. OPERATION

① Zero Adjustment

If error message "Err 0" appears in the display when the power switch is turned on, adjust to zero by key operation.



② Various Setting

■ Various Setting (No.1)

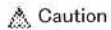
Run mode display

rUt N.m
0.0

Snug Torque setting

Sn1 N.m
010.0

Maximum Tightening Torque



When not using tightening torque, set value to 000.

SE N.m
020.0

Maximum Tightening Torque setting

SEH N.m
025.0

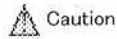
1st Angle value setting

AS1 N.m
A090

1st Angle maximum value setting

AH1 N.m
A095

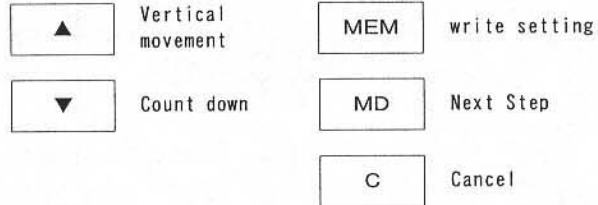
to 2nd Angle setting



Setting can only made from run mode.
Push reset from measuring mode to run mode to setting.



Press keys, C → MEM → MD



Display	Contents
Sn1	Snug Torque
SE	Tightening Torque
SEH	Tightening Torque maximum value
AS1	1st Angle
AH1	1st Angle maximum value
AS2	2nd Angle
AH2	2nd Angle maximum value
AS3	3rd Angle
AH3	3rd Angle maximum value
Cn1	Tightening count
Ar	Measurement Time
do	Data output method
nG	Setting at NG

■ Various Setting (No.2)

2nd Angle value

AS2 AS2 N.m
A090

Caution
 when not using
 2nd angle, set
 value to 000.

2nd Angle maximum value

AH2 AH2 N.m
A095

3rd Angle value

AS3 AS3 N.m
A090

Caution
 When not using
 3rd angle, set value
 to 000.

3rd Angle maximum value

AH3 AH3 N.m
A095

Tightening count

Cn1 Cn1 N.m
05

Count 1~20

Measuring time

Ar Ar N.m
0.5

Measuring time 0~5.0 seconds

Caution
 When not using measurement function, set 0 second

Data output method

do do N.m
Prn

Pc	PC output
Prn	Printer output

Setting at NG

nG nG N.m
nG-0

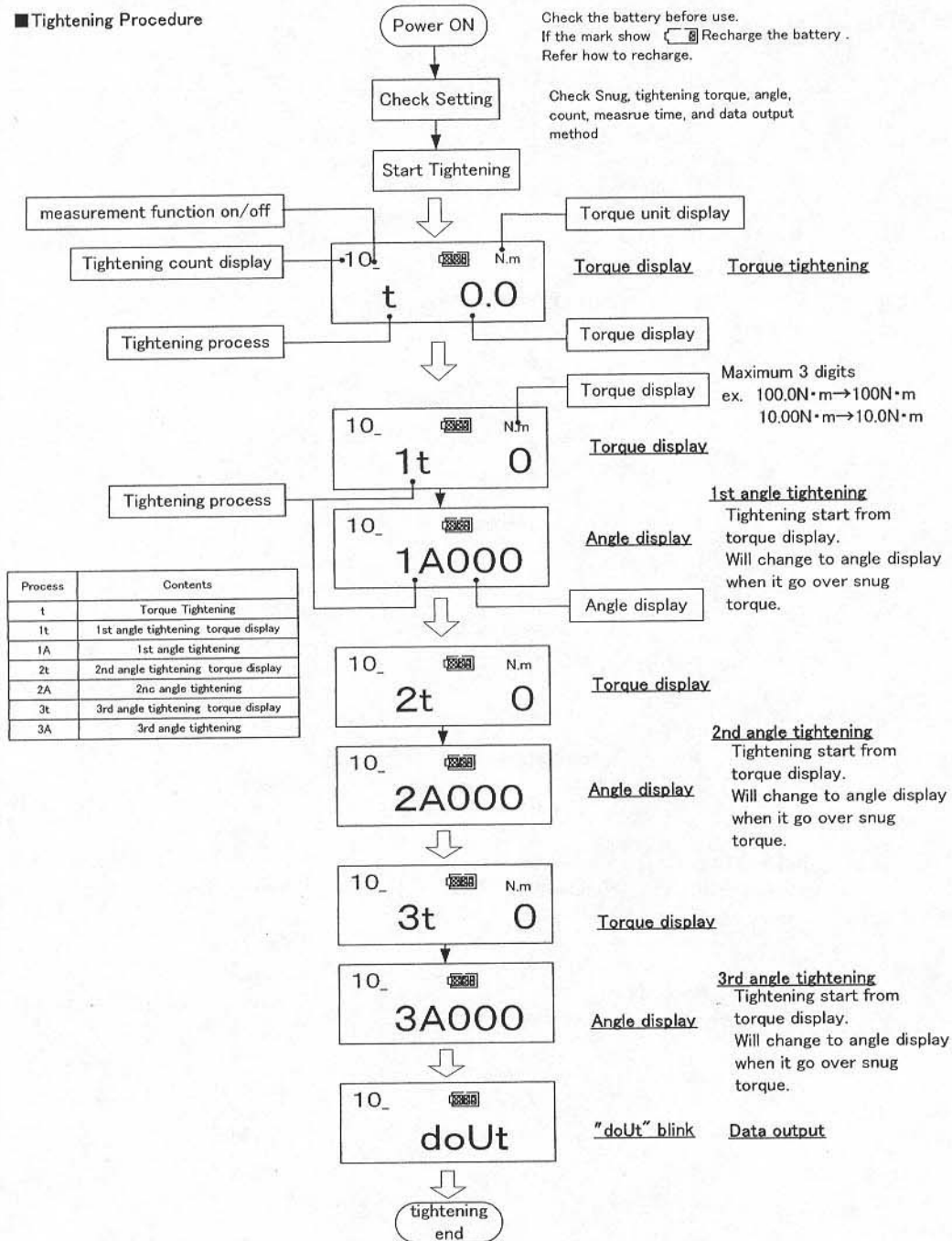
nG-0	Only NG
nG-A	Start from begging

Run Mode Display End Setting

rUt rUt N.m
0.0

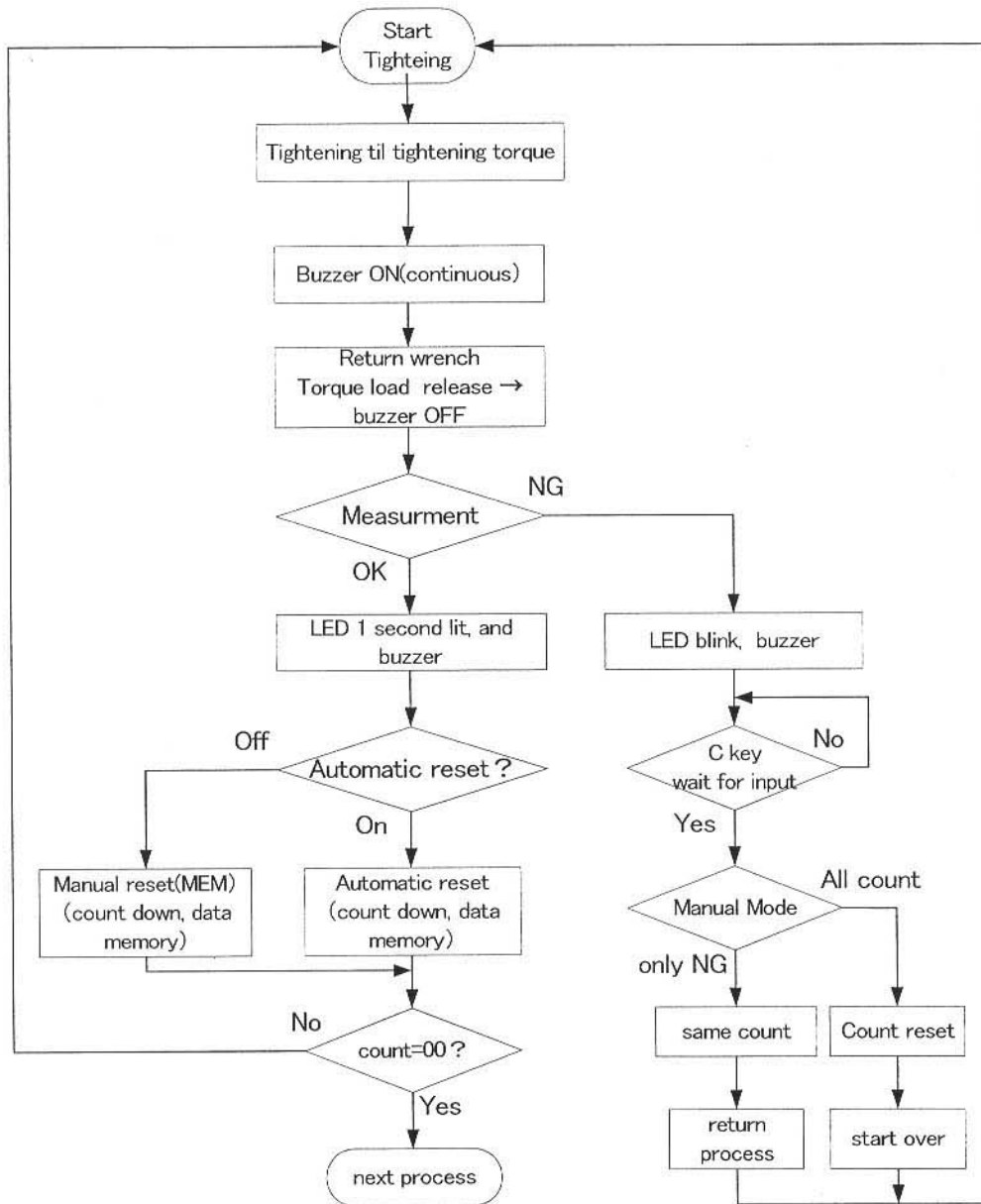
6. How to Use

■ Tightening Procedure



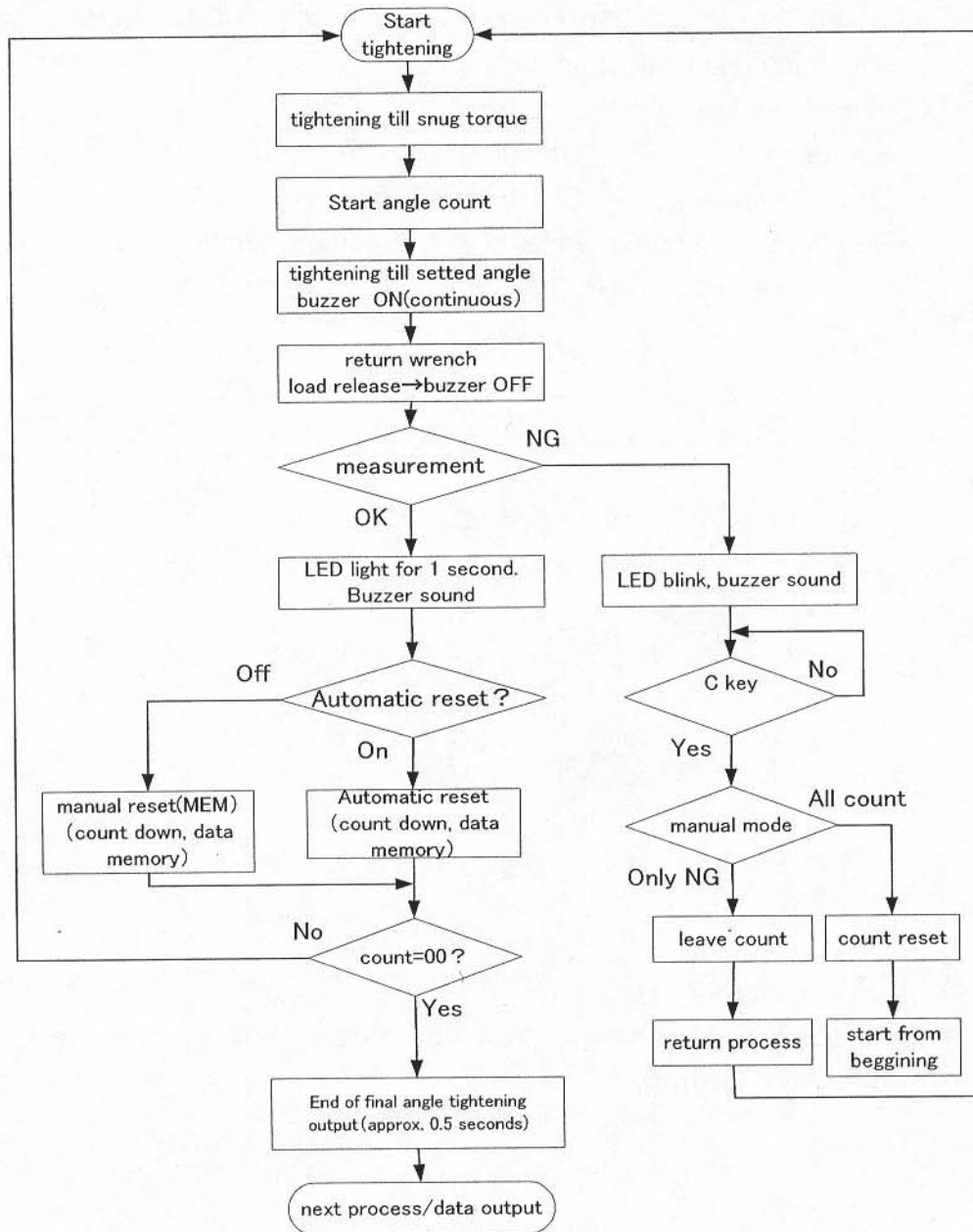
I. Torque Tightening

■ Torque Tightening Mode



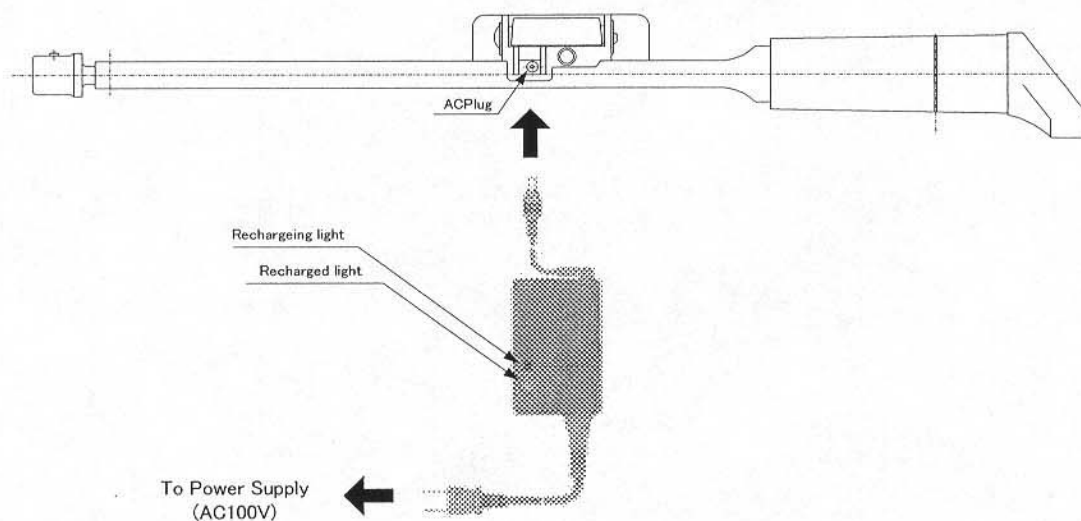
II. Angle Tightening

■ 1st, 2nd, and 3rd Angle Mode



III. Battery charging

- 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 lit-----On charging
Green lamp lit-----Charging is completed
Red lamp flashing/Green lamp lit-----charging error
- ④ When green lamp is lit, the charging is completed.



⚠ CAUTION

Disconnect the AC charger from the Power Supply and the Digital Wrench after charging.

7. OPTIONAL ACCESSORIES

I. Tohnichi Printer

EPP16M2

II. Cable for EPP16M2 Printer

Catalog No.381 (EPP16M2)

Catalog No.377 (EPP16M)

8. Data output

Data Form : RS232C
 Transmit Method : Start stop synchronous serial
 bps Rate : 2400bps
 Data Length : 7bit
 Stop Bit : 1bit
 Varity : None

Snug Torque output format

R	E	S	,	0	1	,	0	2	0	.	0	CR	LF
---	---	---	---	---	---	---	---	---	---	---	---	----	----

Header Snug Display Counter Snug Torque Data Delimiter
(include comma)

Angle 1st, 2nd, and 3rd output format

R	A	1	,	0	1	,	0	9	0	CR	LF
---	---	---	---	---	---	---	---	---	---	----	----

Header Angle Display Counter Angle Data Delimiter
 A1:1st Angle
 A2:2nd Angle
 A3:3rd Angle

Final Torque output format

R	E	T	,	0	1	,	0	2	0	.	0	CR	LF
---	---	---	---	---	---	---	---	---	---	---	---	----	----

Header Final Torque display Counter Final Torque Data Delimiter
(include comma)

□ **Transmission to PC**

① **Transmit 1 data**

Transmit data to PC by pressing MEM key.

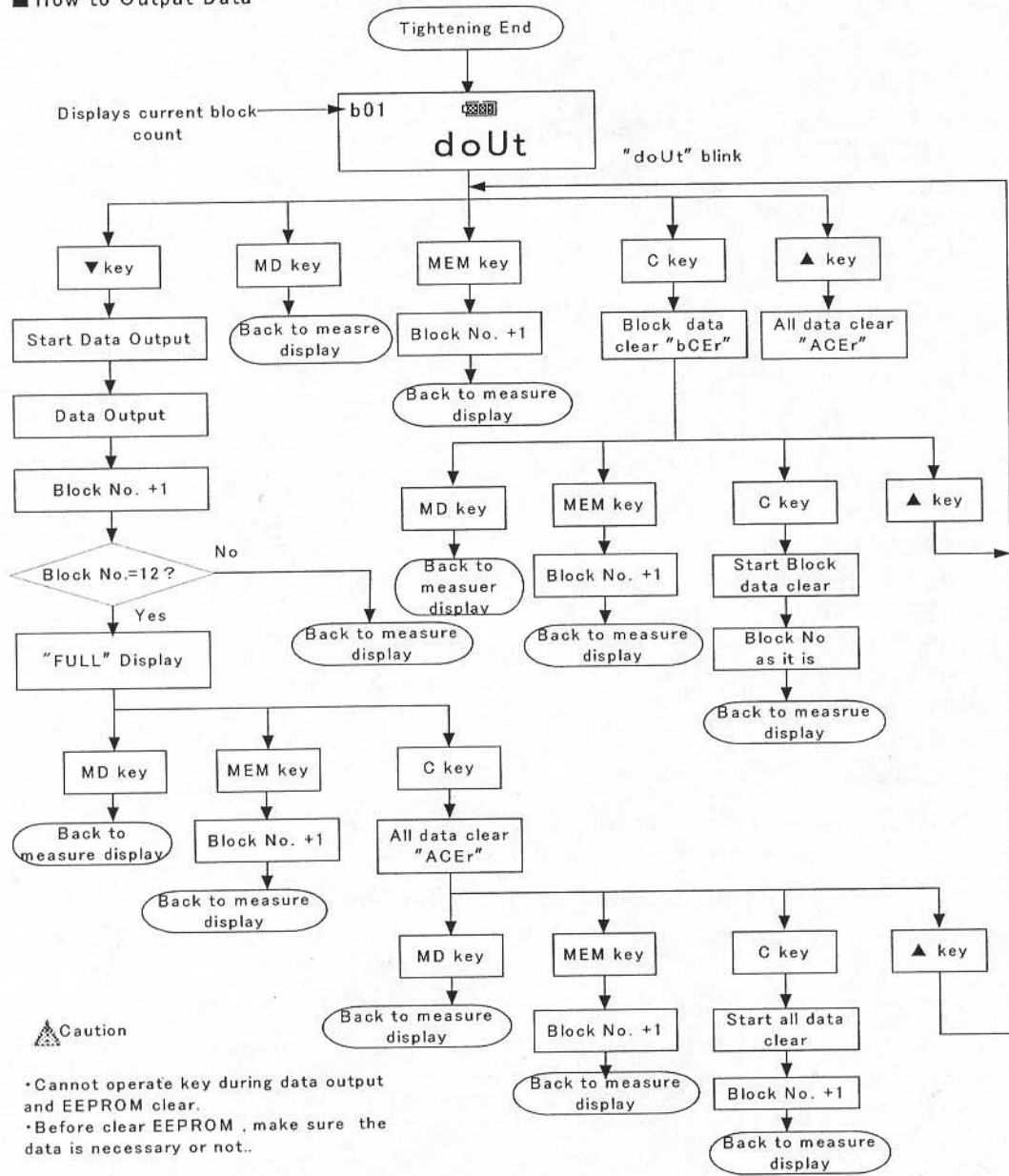
When at automatic measure mode, data is automatically transmitted if data is OK.

② **Transmit all data** (Refer to application manual)

After final process, " doUt" display will blink. Transmit all data by pushing ▼key.

Output 1 engine (Maximum 20 count each) snug torque, 1st angle, 2nd angle, and final torque (when torque reach final set angle) .

■ How to Output Data



PC Output example (Output altogether)

■ PC Data Output example

RES,01,020.0	}	Snug Torque Data
RES,02,021.0		
RES,03,020.5		
RES,04,020.4		
RES,05,020.6		
RA1,01,090	}	1st Angle Data
RA1,02,092		
RA1,03,090		
RA1,04,095		
RA1,05,090		
RA2,01,090	}	2nd Angle Data
RA2,02,091		
RA2,03,092		
RA2,04,091		
RA2,05,090		
RET,01,065.0	}	Final Torque Data
RET,02,064.0		
RET,03,063.0		
RET,04,066.0		
RET,05,065.0		

⚠ Caution

CR+LF display at delimiter will be added in actual display. Above example omitted it.

Printer Output Example (Output altogether)

■ Printer Data Output Example

1: S 20.0 N•m	→ Snug Torque
:1A 90 deg	→ 1st Angle
:2A 92 deg	→ 2nd Angle
: T 65.0 N•m	→ Final Torque
2: S 21.0 N•m	
:1A 91 deg	
:2A 92 deg	
: T 64.0 N•m	
3: S 22.0 N•m	
:1A 93 deg	
:2A 95 deg	
: T 66.0 N•m	