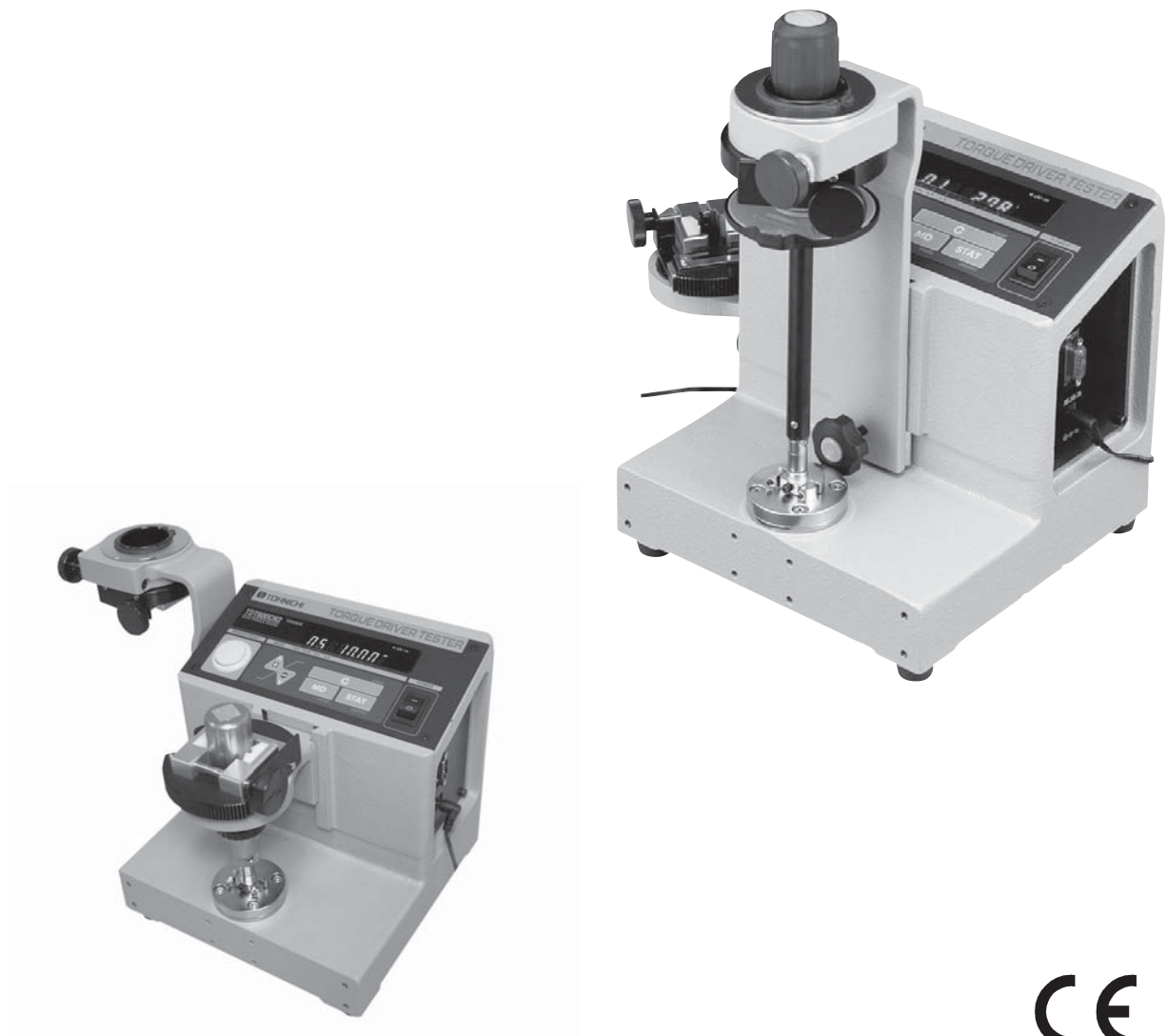


# DIGITAL TORQUE DRIVER TESTER MODEL TDT2-G

## OPERATING INSTRUCTION

TDT2-G TDT2-G Model



CE

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

## Safety Precautions

To customers: Before using this product, please read this operating instruction carefully to use it properly.

If you have any question, please contact your nearest distributor or TOHNICHI MFG. CO., LTD. This operating instruction should be stored in a safe place.






### Safety Symbol

This symbol is used for drawing attention to "safety precautions". If you see this symbol in this operating instruction, attention should be paid to safety. Take preventative actions according to the description and conduct "safe operations and proper control".

### Signal Words

The signal words are the headers which indicate the level of hazard that should be known for human safety and in handling devices. The signal words for safety are "Danger", "Warning" and "Caution" depending on the level of hazard to human. The signal words are used with the safety symbol to indicate the following situations.

- " **Danger**": Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
- " **Warning**": Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
- " **Caution**": Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

### **Warning**

- (1) Stop using the product when smoke comes out or strange smell or unusual noise occurs.  
Use in an abnormal state may result in electric shock or fire. Immediately turn off the power, remove the plug from the outlet and contact your nearest distributor or TOHNICHI MFG. CO., LTD.
- (2) Do not disassemble or modify this driver tester.  
It may result in loss of safety, degradation in functions, shortening of product life, or failure.
- (3) Stop using the product when foreign matter or liquid such as water gets inside.  
If not, you may be exposed to the danger of electric shock or fire.
- (4) Do not connect or disconnect the power plug with wet hands.  
You may be exposed to the danger of electric shock.
- (5) Do not use this driver tester with a power voltage other than that specified (AC100V to 240V).  
Use with any unspecified power voltage may result in electric shock or fire.
- (6) Do not use a damaged power cable.  
Use of a damaged power cable may result in electric shock or fire.  
When handling the power cable, follow the instructions below.
  - Do not damage, extend or heat the power cable.
  - Do not yank the power cable, put heavy objects on it, or pinch it.
  - Do not bend the power cable by force, twist it or bind it.
  - Do not use a power cable other than that supplied with the product.
  - Do not use the power cable with other devices.
- (7) Handle the power plug carefully.  
Improper handling may result in fire.
  - Remove any foreign matter such as dust before inserting the plug into outlet.
  - Be sure to insert the power plug fully into outlet.
- (8) When removing the power plug from outlet, grasp the plug by hand.  
Do not pull on the power cable. It may damage the cable, resulting in fire or electric shock.
- (9) Do not place this driver tester on an unstable or shaky place such as a rickety table or slope.  
The driver tester may fall, resulting in injury.
- (10) Do not put this driver tester in a place where inflammable liquid or combustible gas is present.  
It may cause electric shock or fire.
- (11) Be sure to use the specified accessories or options.  
Do not use any accessory or option other than those specified in this operating instruction.  
Use of any unspecified accessory may result in accident or injury.

**⚠ Caution**

- (1) Do not put this driver tester in a place of much moisture or dust, in a place that is exposed to water or direct sunlight, or in a place where the humidity or temperature fluctuates largely.  
It may result in electric shock, fire, malfunction, degradation of performance or failure.
- (2) Clean the power plug periodically. Before cleaning, disconnect the plug from outlet and clean the root of the plug and the portion between the blades.  
Accumulation of dust at the root of the power plug may cause a short circuit, leading to fire.
- (3) If this driver tester is not to be used for a long time, be sure to disconnect the power plug from outlet for safety's sake.
- (4) Before moving this driver tester to another place, be sure to turn off the power, remove the power plug from outlet and disconnect all connecting cables. When moving the driver

tester, avoid shock or vibration to it.

It may damage the power cable or connecting cables, resulting in fire, electric shock or malfunction.

- (5) Do not use this driver tester to conduct measurements beyond its capacity.  
For safe and efficient operation, use this driver tester to measure the torque wrenches suited to the capacity.  
Measurement beyond the capacity may cause accident or damage.
- (6) Check for any damaged parts.  
Before use, check the driver tester, accessories and other parts for damage and make sure that it operates normally and fulfills the specified functions.  
Check the parts and all other portions that may affect the operation for damage, installation status, etc.  
For replacement or repair of damaged parts, contact your nearest distributor or TOHNICHI MFG. CO., LTD.

## Precautions for Use

For proper and safe use

- (1) Do not use with a power voltage other than in the range of AC100V to 240V.  
Use the power cable supplied with the driver tester. If the driver tester is used with AC 125V or more, prepare a power cable conforming to the power supply voltage and the standard.
- (2) To prevent electric shock or failure due to static, insert the plug of the power cable to an outlet (three-wire type) with a protective earth terminal which is properly grounded using the supplied 3-wire power cable.  
If power is supplied from a two-wire outlet using a 3P-2P conversion adapter, connect the ground terminal of the 3P-2P conversion adapter to ground.  
If a 3-wire outlet is not available and it is difficult to ground with the ground terminal of the 3P-2P conversion adapter, connect the F.G. terminal on the rear panel to ground.
- (3) Do not use this torque driver tester in an environment other

than that specified in the operating instruction.

- (4) Do not disassemble or modify this torque driver tester.
- (5) Before use, make a pre-operation inspection and check the settings.
- (6) If this torque driver tester gets wet with water or grease, it may break down or burn out. Be careful not to drop water or grease.
- (7) Do not let this torque driver tester fall or bump. It may result in damage or failure.
- (8) Use this torque driver tester within the measurement range specified in the operating instruction.
- (9) Be sure to conduct a periodic inspection.
- (10) Before measuring, make sure that "zero" is displayed.  
Should the driver tester give out abnormal smell or catch fire during use, stop using it immediately. Then, move the driver tester to a safe place and contact your nearest distributor or TOHNICHI MFG. CO., LTD.

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# 1 Features

Model TDT2-G is a digital torque driver tester designed for calibrating or adjusting torque drivers and small torque wrenches, and it has the following features.

- Mechanical loading eliminates errors caused by varied factors such as operator's measuring speed or application force.
- Torque driver will be firmly fixed by the loading device, which minimizes individual margin of errors, especially when calibrating direct-reading torque drivers.
- Units of measure include Newton (cN·m), Metric (kgf·cm) and American (ozf·in, lbf·in).
- Up to 99 data can be stored. The number of samples, maximum value, minimum value or mean value of the stored data can be displayed.
- The driver tester has an RS232C-compliant output connector as standard, and it can be easily connected to a PC or the Tohnichi printer.
- Adaptable to AC100-240V±10%. The driver tester can be used in most of countries or regions in the world.
- This driver tester has CE marking and can be used in EU without problem.

# 2 Components

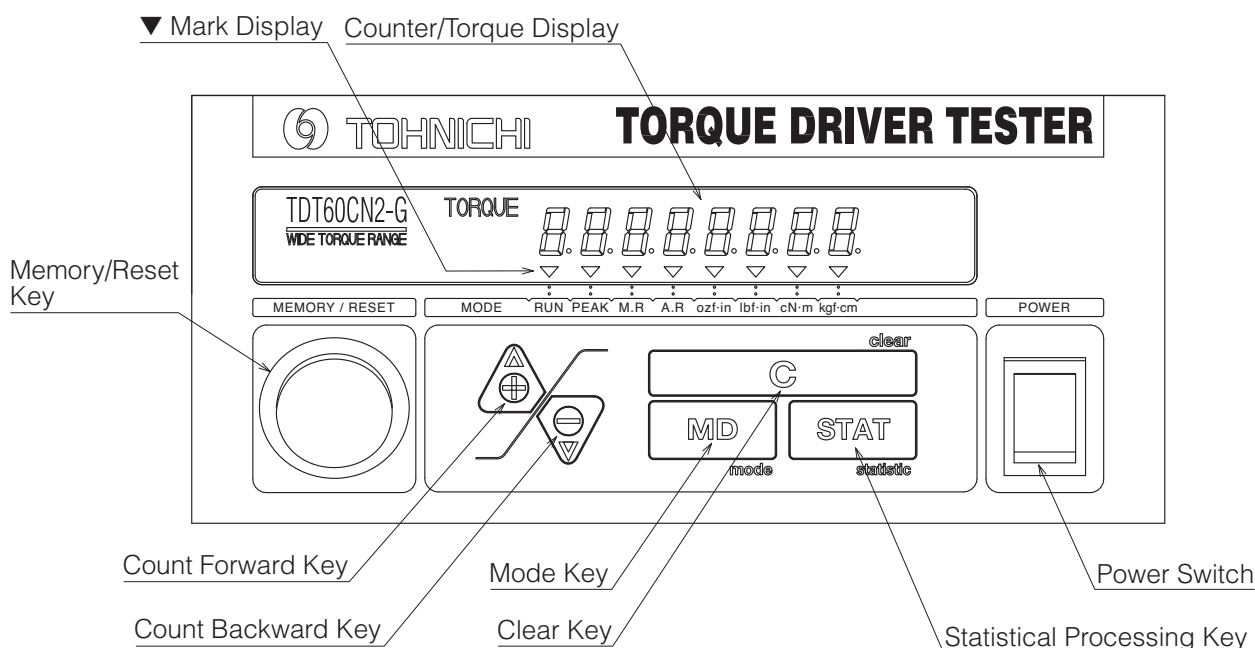
1) Main unit	1 unit
2) AC adapter (BA-3)	1 pc.
3) Power connector conversion adapter (C type)	1 pc.
4) Loading device	2 sets
5) Square drive bit	1 pc.
6) Operating instruction	1 pc.
7) Operation Sticker	1 pc.

# 3 Specifications

Model			TDT60CN2-G	TDT600CN2-G
Torque Range	Newton [cN·m]	Min. to Max.	2 to 60	20 to 600
		1 digit	0.01	0.1
	Metric [kgf·cm]	Min. to Max.	0.2 to 6	2 to 60
		1 digit	0.001	0.01
	American [ozf·in]	Min. to Max.	3 to 80	30 to 800
		1 digit	0.01	0.1
American [lbf·in]	Min. to Max.	0.2 to 5	2 to 50	
	1 digit	0.001	0.01	
Direction			Clockwise and Counter-Clockwise	
Accuracy			±1% + 1digit	
Data Memory			99 Data	
Measurement Mode			PEAK/RUN	
Statistical Processing			Number of samples, maximum value, minimum value, and mean value	
Zero Adjustment			Auto	
Reset			Manual/Auto [Settable in the range from 0.1 to 5.0 sec.]	
Data Output			RS232C-Compliant	
Square Drive			Hex. across flats 6.35 Male, Minus with a 0.7 mm groove	
Operating Temperature Range			0 to 40°C Non condensing	
Power			AC100-240V 50/60Hz	
Weight			Approx. 13.5kg	
Loading Device for LTD/RTD	Applicable Grip Diameter		7 to 40mm	
	Applicable Grip Height		60 to 150mm	
	Holding Function		None	
Loading Device for FTD	Applicable Grip Diameter		7 to 36mm	
	Applicable Grip Height		140 to 230mm	200 to 290mm
	Holding Function		Worm gear fitted	
Applicable Models  ( ) is applicable for a part of the capacity range.		LTD/RTD	15,30,60CN	(60),120,260,500CN
		NTD/RNTD	15,30,60CN	(60),120,260,500CN
		AMLD	(4),8CN	
		BMLD	15,30CN	
		FTD	50CN	(50),100,200,400CN
		FTD2-S	(5),10,20,50CN	(50),100,200,400CN

# 4 Names of Parts

## 4-1. Indicator and Operating Parts



- (1) Counter/Torque Display  
It displays the counter and torque value.
- (2) ▼ Mark Display  
▼ appears according to each status below.
  - RUN: RUN mode is selected.
  - PEAK: PEAK mode is selected.
  - M.R: PEAK mode is selected while Auto memory/Reset has not been set.  
RUN mode is selected.
  - A.R: PEAK mode is selected while Auto memory/Reset has been set.
  - Unit: ▼ appears on the unit (ozf-in, lbf-in, cN·m or kgf·cm) selected.
- (3) Count Forward Key (▲ Key)  
It moves the counter forward by one or continuously to read out measured data.
- (4) Count Backward Key (▼ Key)  
It moves the counter backward by one or continuously to read out measured data.
- (5) Clear Key (C Key)
  - Use this key in PEAK mode to clear the displayed data.
  - Use this key in RUN mode for auto zero adjustment.
- (6) Statistical Processing Key (STAT Key)  
Use this key to select the number of samples, maximum value, minimum value or average value.

(7) Mode Key (MD Key)

Push this key to select RUN mode/PEAK mode.

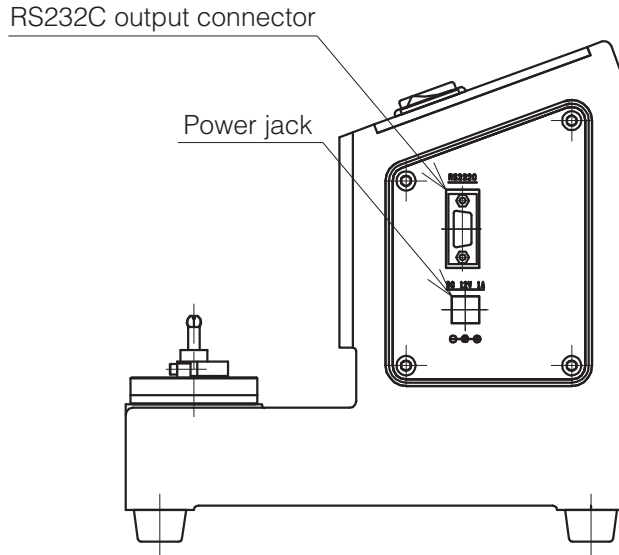
(8) Memory/Reset Key (MEMORY/RESET)

Push this key to save the measured data (measured torque, measurement date and time) and moves the counter forward by one.

(9) Power Switch

Use this switch to turn the power ON or OFF.

**4-2. Power Source and Output**



(1) Power jack (12V, 1A, Center positive)

Connect the supplied AC adapter (BA-3).

(2) RS232C output connector



# 5 How to Use

## 5-1. Handling

- (1) Place the TDT2-G on a sturdy and stable workbench in a horizontal position.
- (2) Connect the AC adapter to the power jack on the side of the main unit. Make sure that the power switch is OFF and insert the plug into an outlet.
- (3) Turn on the power switch. (After the power is turned on, leave the unit as it is for 30 minutes or more for stabilization.)
- (4) Conduct the following settings:  
 Auto memory/reset setting, communication setting, and clock setting  
 For the setting procedures, see "6. Various Settings".
- (5) Install the adapters suitable for the torque driver to be measured.

## 5-2. Measurement

- (1) Using the MD key, set the measurement mode suitable for the torque driver to be measured.  
 Click type torque driver (RTD, LTD, etc.) : PEAK mode (PEAK)  
 Dial direct reading type torque driver (FTD, STC, etc.) : RUN mode (RUN)
- (2) Make auto zero adjustment.  
 For the adjustment procedure, see "5-6. Auto Zero Adjustment".
- (3) Check the measurement torque of the torque driver.
- (4) Set the torque driver, put the grip in the loading device, and clamp the grip.
- (5) Apply torque by the loading device up to the measurement point of the model:  
 Click Type : To the point the driver "clicks" at the set torque.  
 Direct-reading type : To the point the dial indicator of the torque driver reaches the measurement point.
- (6) Click Type : After reaching "click", release the load. Push MEMORY/RESET to save the data and move forward to the next counter. (In AUTO MEMORY/RESET, the data will be saved automatically when the load is released down to less than 2% of the maximum capacity.)  
 Direct-reading type : Push MEMORY/RESET at the point the dial indicator indicates the measurement point to save the data and moves forward to the next counter.
- (7) Repeat the above steps (5) and (6) till the measurement is complete.

## 5-3. Deletion of Data

- (1) To delete one piece of data:  
 Using ▼ or ▲ key, display the data to delete and press "C" key. The data will be deleted.

(2) To delete a certain range of data between two selected count values:

Using ▼ or ▲ key, select the last count value of data to delete and then, press STAT key. "ST" will be displayed. Using ▼ or ▲ key, select the first count value of data to delete and then, press STAT key. With any of "n", "HI", "Lo" or "Av" on the display, press "C" key while pressing "STAT" key. The data between the two selected values will be deleted.

(3) To delete all stored data:

Turn the power OFF. All data will be deleted.

**Caution**

- ※ Before deleting data, re-check whether or not the data should be deleted.
- ※ Before turning off the power, be sure to save the necessary data in another device.

**5-4. Statistical Processing Function (Number of samples, maximum value, minimum value and average value)**

(1) Using ▼ or ▲ key, display the last count of the data range to subject to statistical processing.

(2) Press STAT key once, and "ST" is displayed. Using ▼ or ▲ key, display the first count in the data range to subject to statistical processing.

Press STAT key, and the sampling number "n", maximum value "HI", minimum value "Lo" and average value "Av" in the specified data range are displayed.

**5-5. Auto Memory/Reset**

After PEAK hold, the measured data will be automatically saved 0.1 ~ 0.5 sec (selectable) after releasing load, and the counter moves forward to the next measurement.

**5-6. Auto Zero Adjustment**

When the torque is lower than the value indicated in the table below, press "C" key or turn the power OFF/ON. Auto Zero function will be activated.

Before conducting the above operation, remove the torque driver.

TDT60CN2-G	3 cN·m
TDT600CN2-G	30 cN·m

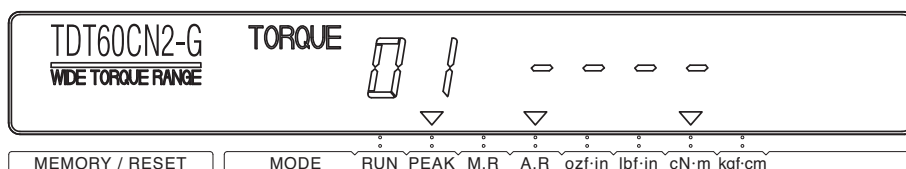
If the torque load exceeds the above value at unloaded condition, "Err 9" will be displayed.

**<<When "Err 9" is displayed>>**

- Under no load condition, press "C" key.
  - \* If the "Err 9" message disappears, the driver tester functions properly.
- If the "Err 9" message does not disappear, turn OFF the power, and then turn it ON again.
  - \* If the "Err 9" message remains displayed, the torque sensor or the circuit board may have problems.

**5-7. Over-Torque Alarm**

If the torque exceeds 110% of the maximum measurement value, bars appear on the display and flash to warn the user of possible breakdown of the tester.



**5-8. Error Display**

The TDT2-G has a self-diagnosis function. When a problem occurs, any of the error messages from Err 1 to 9 will be displayed.

**<<When Err 1 to Err 5 is displayed>>**

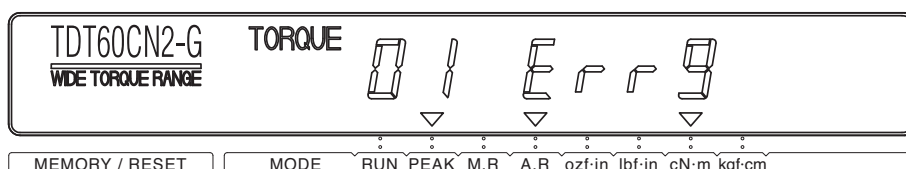
- Turn OFF the power switch. Then, without touching any key, turn ON the power again.
  - \* If the "Err" message disappears, the driver tester functions properly.
  - \* If the "Err" message remains displayed, the tester needs repair. Contact your nearest distributor or TOHNICHI MFG. LO., LTD.

**<<When "Err 8" is displayed>>**

\* The TDT2-G needs repair. Contact your nearest distributor or TOHNICHI MFG. LO., LTD.

**<<When "Err 9" is displayed>>**

- Under no load condition, press "C" key.
  - \* If the "Err 9" message disappears, the driver tester functions properly.
- If the "Err 9" message does not disappear, turn OFF the power, and then turn it ON again.
  - \* If the "Err 9" message remains displayed, the tester needs repair. Contact your nearest distributor or TOHNICHI MFG. LO., LTD.



# 6 Various Settings

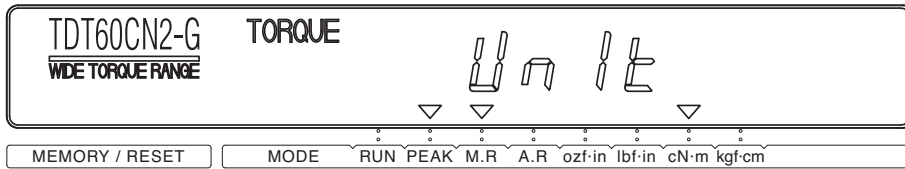
Under no load condition, press keys "C" → "STAT" → "MD" in sequence. Now, the TDT2-G is ready for setting.

<<Measurement mode → Measurement Unit → Auto Memory/Reset → Output format → Communication baud rate → Data length → Parity → Measurement mode>>

## 6-1. Measurement Unit

Using ▼ or ▲ key, select the unit and press STAT key to confirm.

If "C" key is pressed, the setting is canceled and the display goes back to the measurement mode.

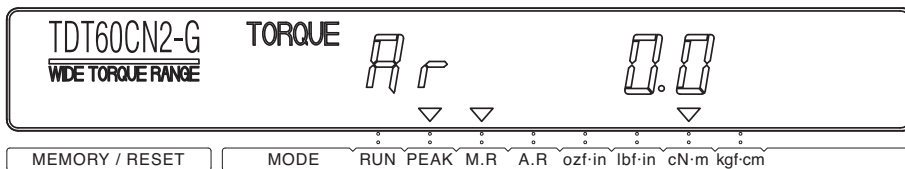


## 6-2. Auto Memory/Reset (Factory default: 0.0)

Using ▼ or ▲ key, select any time between 0.1 to 5.0 seconds and press STAT key to confirm.

If you prefer manual processing, press STAT key while "0.0" is displayed.

If "C" key is pressed, the setting is canceled and the display goes back to the measurement mode.



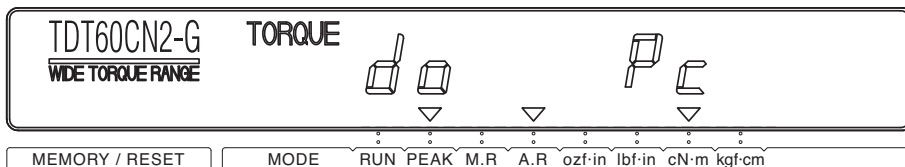
## 6-3. Communication Setting

(1) Output Format (Factory default: PC Output)

Select RS232C output format for transferring data to other media.

Using ▼ or ▲ key, select "Prn" for printer output or "PC" for PC output and press STAT key to confirm. Now, the display is ready for communication baud rate setting.

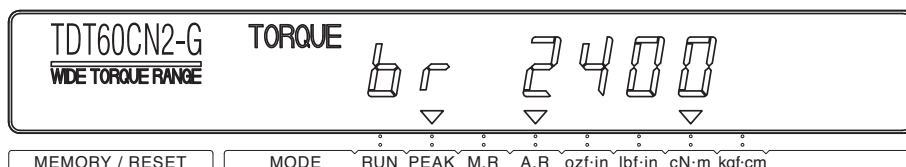
If "C" key is pressed, the setting is canceled and the display goes back to the measurement mode.



(2) Communication Baud Rate (Factory default: 2400 bps)

Using ▼ or ▲ key, select "2400", "4800", "9600" or "19200" and press STAT key to confirm. Now, the display is ready for data length setting.

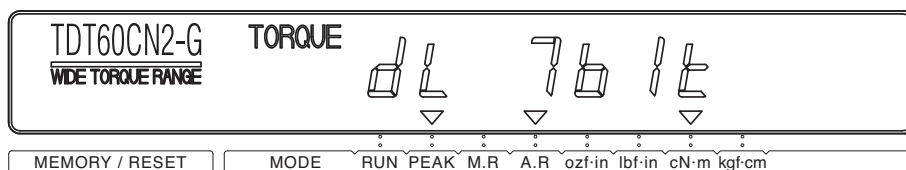
If "C" key is pressed, the setting is canceled and the display goes back to the measurement mode.



(3) Data Length (Factory default: 7bit)

Using ▼ or ▲ key, select "7bit" or "8bit", and press STAT key to confirm. Now, the display is ready for parity setting.

If "C" key is pressed, the setting is canceled and the display goes back to the measurement mode.

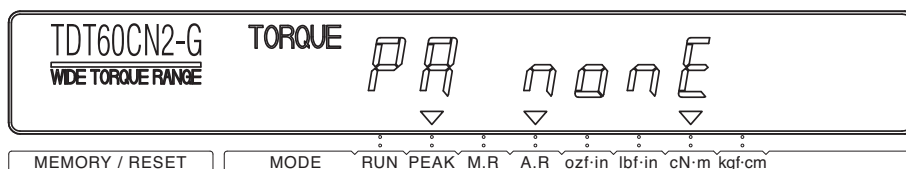


(4) Parity (Factory default: None)

Using ▼ or ▲ key, select "nonE" for none, "EvEn" for even number and "odd" for odd number.

Then, press STAT key to confirm. Now, the display goes back to the measuring mode.

If "C" key is pressed, the setting is canceled and the display goes back to the measurement mode.



# 7 External Output Function

## 7-1. Printer Output

Connect the TDT2-G and the Tohnichi printer (EPP16M2) using a printer cable (Catalog No. 382).

### (1) Printing one by one

After measurement, press Memory/Reset key to print the measured data. In this mode, the results of statistical processing are not printed. In Auto Memory/Reset mode, printing starts automatically.

### (2) Printing a certain range of data

Using ▼ or ▲ key, display the last count value in the print range and press STAT key, then "ST" will be displayed. Using ▼ or ▲ key, display the first count value in the print range and press STAT key. Then, press "▲" key while "n" is displayed.

The measured value, sampling quantity "n", maximum value "MAX", minimum value "MIN" and average value "AVE" of the selected range will be printed out.

**Continuous printing example**

```

1 :  1 2 3 . 4   c N · m           Counter: Torque Unit
2 :  1 2 7 . 6   c N · m

7 :   = = = . =   c N · m
8 :  1 2 2 . 8   c N · m
- - - - -
n = 7
M A X  1 2 7 . 6   c N · m
M I N  1 2 2 . 8   c N · m
A V E  1 2 5 . 0   c N · m
    
```

When the measured value displayed on the TDT2-G is "0" or "----", the value is excluded from the statistical processing, and "===" will be printed out.

### (3) Printing only statistical processing value

Using ▼ or ▲ key, display the last count value in the print range and press STAT key. Then, "ST" will be displayed. Using ▼ or ▲ key, display the first count value in the print range and press STAT key. Press "▼" key while "n" is displayed.

Only the sampling quantity "n", maximum value "MAX", minimum value "MIN" and average value "AVE" of the selected range will be printed out.

## 7-2. PC Output

- Data format : RS232C-compliant
- Transmission system : Start-stop synchronization serial
- Baud rate : 2400/4800/9600/19200 bps
- Data length : 7bit/8bit
- Stop bit : 1bit
- Parity : None/Even/Odd

### Format

R	E	,	0	1	,	0	1	2	.	3	CR	LF
Header			Counter			5-digit torque (including decimal point)					Delimiter	

## **8** Optional Accessories

- (1) Printer for this tester .....EPP16M2
- (2) Cable for printer.....Catalog No. 382
- (3) Cable for PC  
TDT2-G → PC .....Catalog No. 383
- (4) Calibration kit  
TDTCL60CN (Applicable model: TDT60CN2-G)  
TDTCL600CN (Applicable model: TDT600CN2-G)
- (5) Loading device for TDT....TDTLA



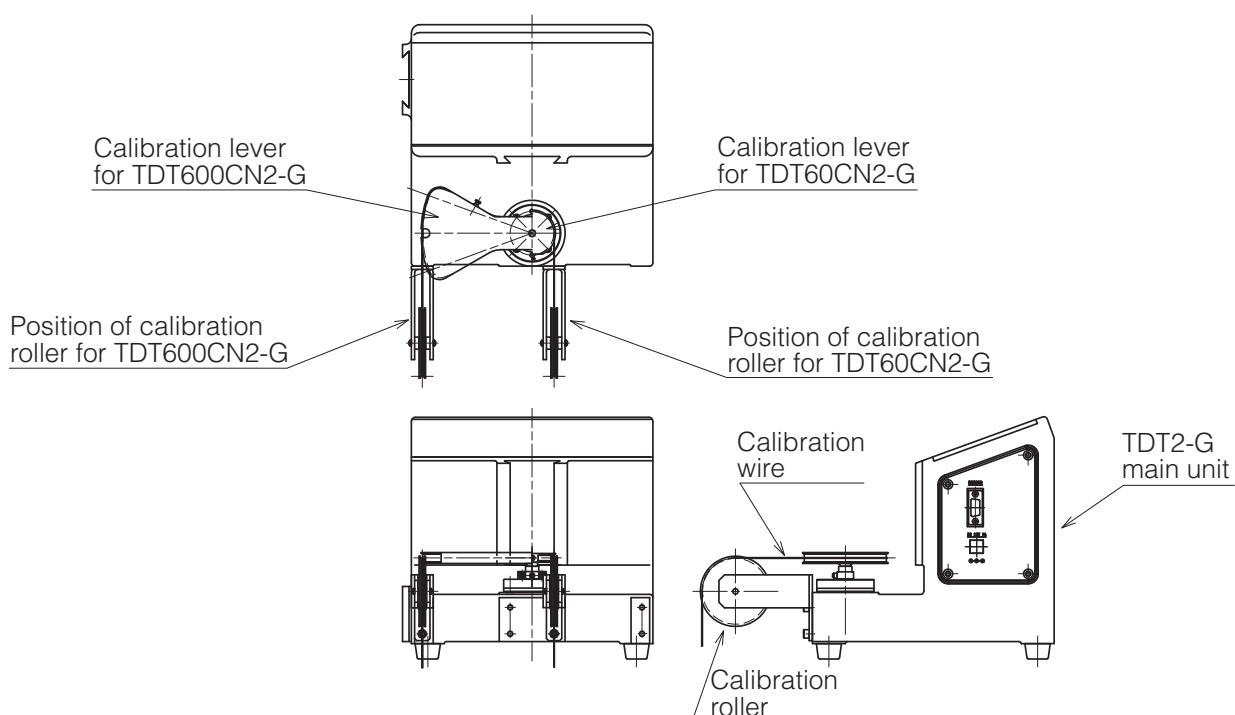
## 9 Calibration Procedure

### (1) Precautions for use

- 1) Be careful not to drop weights on your foot.
- 2) Place a weight gently.
- 3) Start calibration at the minimum value.
- 4) Before calibration, secure the main unit in fixed position to prevent it from moving during calibration.
- 5) Hook wire on the calibration lever securely.

### (2) Calibration procedure

- 1) Place TDT2-G on the measurement table in a horizontal position.
- 2) Turn on the power of TDT2-G. (After the power is turned on, leave the unit as it is for 30 minutes or more for stabilization.)
- 3) Set TDT2-G in RUN mode.
- 4) Insert the square drive of the calibration lever into the TDT2-G sensor portion so that the calibration lever is leveled.
- 5) Hook the wire on the calibration lever, and press "C" key on TDT2-G to make zero adjustment.
- 6) Refer to the table on next page (Weights Information for TDT2-G Calibration), and check the weight. Place weight on the TDT2-G accordingly, and proceed calibration.



## Weights Information for TDT2-G Calibration

Newton Unit

TDT60CN2-G			TDT600CN2-G		
Measuring Point [cN·m]	Loading Weights [kg]	Remarks	Measuring Point [cN·m]	Loading Weights [kg]	Remarks
2	0.1020	Scale Pan + 2g	20	0.2039	Scale Pan + 203.9g
20	1.020	Scale Holder + 20g	200	2.039	Scale Holder + 1.039kg
30	1.530	Scale Holder + 530g	300	3.059	Scale Holder + 2.059kg
40	2.039	Scale Holder + 1.039kg	400	4.079	Scale Holder + 3.079kg
60	3.059	Scale Holder + 2.059kg	600	6.118	Scale Holder + 5.118kg

Metric Unit

TDT60CN2-G			TDT600CN2-G		
Measuring Point [kgf·cm]	Loading Weights [kg]	Remarks	Measuring Point [kgf·cm]	Loading Weights [kg]	Remarks
0.2	0.1	Scale Pan	2	0.2	Scale Pan + 100g
2	1.0	Scale Holder	20	2.0	Scale Holder + 1kg
3	1.5	Scale Holder + 500g	30	3.0	Scale Holder + 2kg
4	2.0	Scale Holder + 1kg	40	4.0	Scale Holder + 3kg
6	3.0	Scale Holder + 2kg	60	6.0	Scale Holder + 5kg

American Unit (lbf·in)

TDT60CN2-G			TDT600CN2-G		
Measuring Point [lbf·in]	Loading Weights [kg]	Remarks	Measuring Point [lbf·in]	Loading Weights [kg]	Remarks
0.2	0.1152	Scale Pan + 15.2g	2	0.230	Scale Pan + 130g
1	0.5761	Scale Pan + 476.1g	10	1.152	Scale Holder + 152g
3	1.728	Scale Holder + 728g	30	3.456	Scale Holder + 2.456g
4	2.304	Scale Holder + 1.304kg	40	4.608	Scale Holder + 3.608kg
5	2.880	Scale Holder + 1.880kg	50	5.761	Scale Holder + 4.761kg

American Unit (**ozf-in**)

TDT60CN2-G			TDT600CN2-G		
Measuring Point [ozf-in]	Loading Weights [kg]	Remarks	Measuring Point [ozf-in]	Loading Weights [kg]	Remarks
3	0.1080	Scale Pan + 8.0g	30	0.2160	Scale Pan + 116.0g
20	0.7200	Scale Pan + 620.0g	200	1.440	Scale Holder + 440g
40	1.440	Scale Holder + 440g	400	2.880	Scale Holder + 1.880kg
60	2.160	Scale Holder + 1.160kg	600	4.320	Scale Holder + 3.320kg
80	2.880	Scale Holder + 1.880kg	800	5.760	Scale Holder + 4.760kg

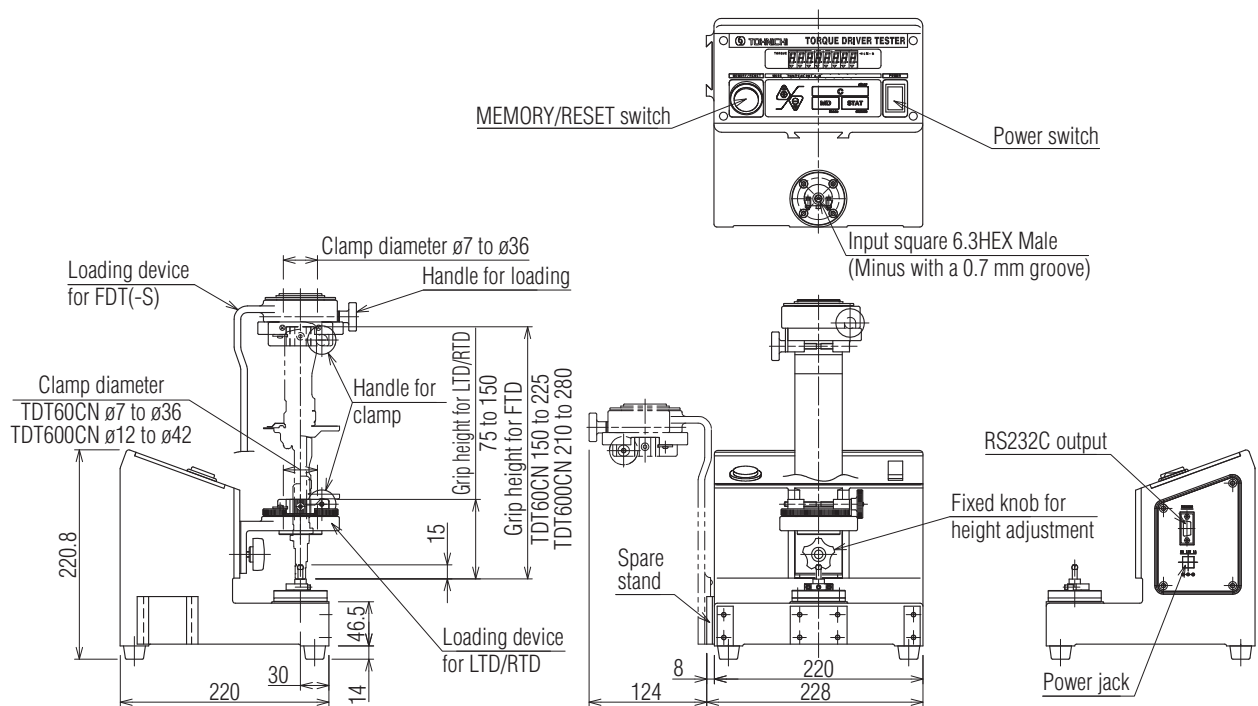
**Required weights**

- (1) For TDT60CN2-G: 1 piece of WS-TCL2 required.
- (2) For TDT600CN2-G: 1 piece of WS-TCL2, 1 piece of WP-TCL2 and 1 piece of WP-TCL5 required.

**Components of TDT2-G Calibration Kit:**

- Calibration Scale Pan 100g 1 pc.
- Calibration Scale Holder 1 kg 1 pc.
- Calibration wire 1 pc.
- Calibration lever 1 pc.
- Calibration roller 1 pc.
- Mounting bolt 2 pcs.

■ TDT60CN2-G, TDT600CN2-G



Designs and specifications are subject to change without notice.



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