DIGITAL TORQUE METER
MODEL TME2

OPERATING INSTRUCTION

TME2 TME2 Model

C E

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.

Precautions for Use

To use the model TME2 properly and safely, please carefully read this operation manual before use. If you have any question, please contact your nearest distributor or TOHNICHI MFG. CO., LTD.

For proper and safe use

(1) Be sure to use with a power voltage from AC100 to 240V±10% as described in this operation manual. The torque meter cannot be used with any other voltage.

(2) Do not give any vibration or shock to the torque meter.

(3) Do not use this torque meter in an environment other than that specified in the operation manual.

(4) Before use, conduct a startup inspection to check the settings.

(5) Be careful not to expose the torque meter to water or oil. If the torque meter gets wet with water or oil, it may break down or burn out.

(6) Do not drop or bump the torque meter. It may result in damage or failure.

(7) Use the torque meter within the measuring range specified in the operation manual.

(8) Be sure to perform a regular inspection.

(9) Before measurement, be sure to make zero adjustment.

(10) To measure a torque exceeding 10N·m, attach the supplied fixing stopper to the base (see the figure below), and secure the base directly on a sufficiently sturdy table that has a horizontal plane.

Should the torque meter give out abnormal smell or catch fire during use, immediately stop using it. Then, move the torque meter to a safe place and contact your nearest distributor or TOHNICHI MFG. CO., LTD.
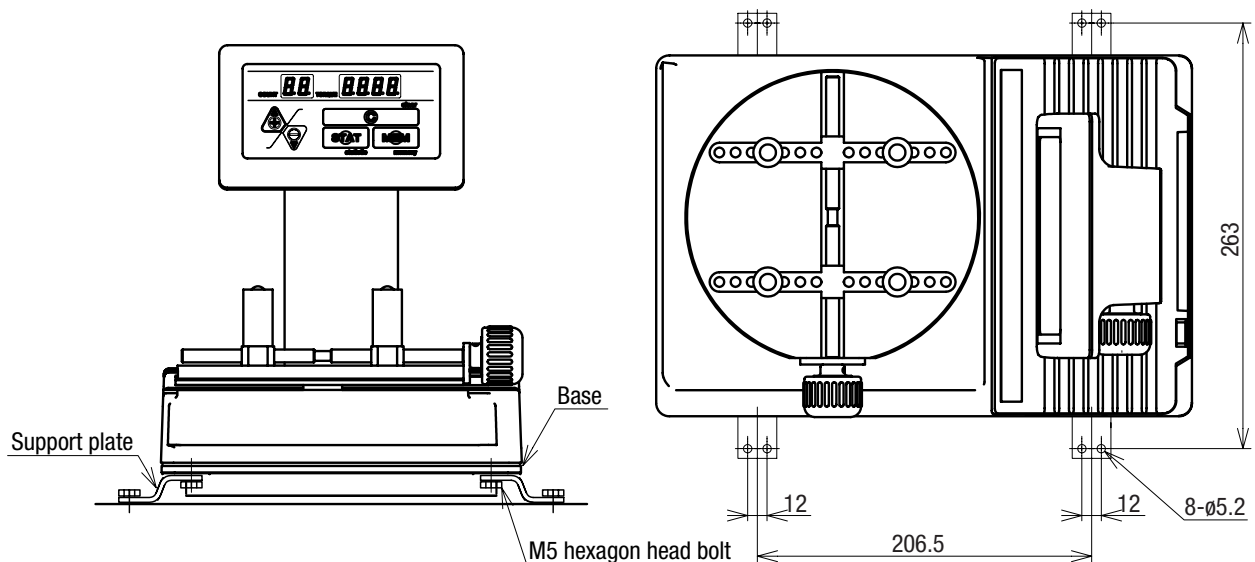
Contents

1 Outline

TME2 is designed to provide wide applications such as measurement of rotational resistance, output torque, operating torque, tightening torque and strength of precision instruments, measurement of tightening force of pins or canister caps and spring force, and inspection of torque drivers or small torque wrenches. It has the following features.

* **Data memory/statistical processing functions**

   Up to 99 measured data can be stored. The number of samples, maximum value, minimum value, average value, range of variations and standard deviation of stored data can be displayed.

* **Data transfer to external devices**

   The RS232C (-compliant) output terminal as standard equipment allows simple connection to a PC or a dedicated printer.

* **Power source**

   Adaptable to AC100-240V±10%. The TME2 can be used in most countries or regions in the world.

* **CE marking acquired**

   The TME2 can be safely used in the EU.

2 Components

1) Main unit of TME2   ... 1 pc.

2) AC adapter (Type: BA-4)   ... 1 pc.

3) Rubber nail   ... 4 pcs.

4) Operation manual   ... 1 pc.

The following components are only for 2TME2.

5) Fixing stopper   ... 4 pcs.

6) Bolt for fixing the stoppers   ... 16 pcs.

7) Nut for fixing the stoppers   ... 8 pcs.

3 Specifications

Model				3TME10CN2	3TME20CN2	3TME50CN2	3TME100CN2	2TME200CN2	2TME500CN2	2TME1000CN2	2TME2000CN2
Newton	Measuring range	Min ~ Max	[cN·m]	2.00 ~ 10.00	4.00 ~ 20.00	10.00 ~ 50.00	20.0 ~ 100.0	40.0 ~ 200.0	100.0 ~ 500.0	200 ~ 1000	400 ~ 2000
		Graduation		0.01	0.02	0.05	0.1	0.2	0.5	1	2

Model				3TME10CN2-M	3TME20CN2-M	3TME50CN2-M	3TME100CN2-M	2TME200CN2-M	2TME500CN2-M	2TME1000CN2-M	2TME2000CN2-M
Metric	Measuring range	Min ~ Max	[gf·cm]	200 ~ 1000	400 ~ 2000	1000 ~ 5000					
			[kgf·cm]				2.00 ~ 10.00	4.00 ~ 20.00	10.00 ~ 50.00	20.0 ~ 100.0	40.0 ~ 200.0
		Graduation	[gf·cm]	1	2	5					
			[kgf·cm]				0.01	0.02	0.05	0.1	0.2

Model				3TME10CN2-Z	3TME20CN2-Z	3TME50CN2-Z	3TME100CN2-Z	2TME200CN2-I	2TME500CN2-I	2TME1000CN2-I	2TME2000CN2-I
English	Measuring range	Min ~ Max	[ozf·in]	2.80 ~ 14.00	5.60 ~ 28.00	14.00 ~ 70.00	28.0 ~ 140.0				
			[lbf·in]					3.50 ~ 17.00	8.80 ~ 44.00	17.6 ~ 88.0	35.0 ~ 175.0
		Graduation	[ozf·in]	0.01	0.02	0.05	0.1				
			[lbf·in]					0.02	0.05	0.1	0.2

Dimension	Length	L'	[mm]	252				331			
	Width	B		158				223			
	Height	H		185				283			
Weight			[kg]	3.5				12			
Accuracy				±1%+1digit							
Data Memory				99 data							
Statistical Processing				Number of samples, maximum/minimum/average value, variation range, standard deviation							
Measurement Mode				PEAK/RUN							
Zero Adjustment				AUTO							
Reset				Manual/Auto (0.1 to 5.0 sec)							
Data Output				RS232C-compliant							
Operating Temperature Range				0-40°C Non condensing							
Power				AC100-240V 50/60Hz							

4 Names of Parts

(1) Counter display

The number of counts is displayed.

(2) Torque measured value display

A torque measured value is displayed.

(3) Count forward key (▲ key)

The counter is moved forward by one or continuously to read out a measured data.

(4) Count backward key (▼ key)

The counter is moved backward by one or continuously to read out a measured data.

(5) Clear key (C key)

In the PEAK mode, the peak value is reset. Or, the stored measured data is cleared. In the RUN mode, the displayed value is automatically set to zero.

(6) Statistical processing key (STAT key)

With this key, the number of samples, maximum value, minimum value, average value, variation range or standard deviation can be selected.

(7) Memory key (MEM key)

With this key, the measured data is stored as well as output to an external device, and the counter is moved forward by one.
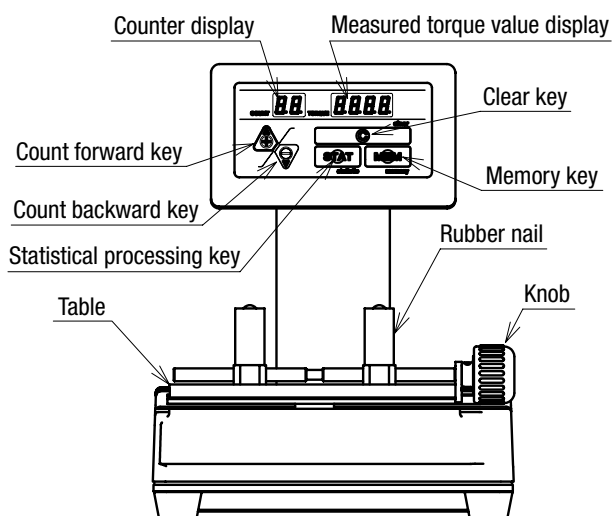
Rear

(8) Power switch

This is a switch for turning the power ON/OFF.

(9) Analog output terminal

At the maximum load, about ±4.5V output is possible. (Max 10mA) RCA type connector

(10) Memory remote terminal

Used to output the measured data to an external device and store it. The counter is moved forward by one.
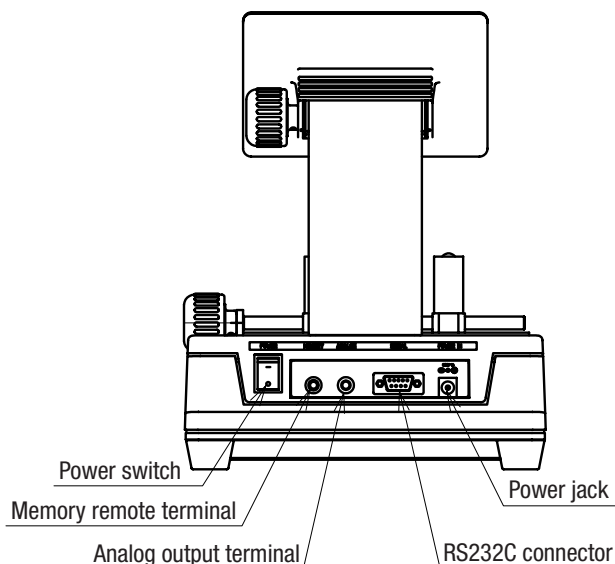
Use under no-voltage contact.

RCA type connector

(11) RS232C terminal

This is a terminal for connecting the TME2 to a printer, PC, etc.

(12) Power jack (12V, 1A, center plus)

Connect the supplied AC adapter (BA-4).

5 Operation

5-1 Preparation

(1) Place the torque meter in a horizontal position.

(2) Insert 4 rubber nails in any holes.

(3) Connect the AC adapter to the power jack on the side of the main unit. Make sure that the power switch is turned off. Then, connect the plug into an outlet.

(4) Turn on the power switch. (After the power is turned on, let the unit stand for 30 minutes or more.)

(5) Set an object to be measured or a jig in the center of a table, and turn the knob to fix it.

(6) Adjust the angle of the display so that it can be easily watched.

5-2 Measurement

When the power is turned on, the unit is set in the peak hold mode (maximum value hold). To use the unit in the RUN mode (Continuous display: a maximum value is not held.), press ▼ key.

If the counter shows "00", the torque display is in the RUN mode. If "C" key is pressed under no load condition, the auto zero function activates and "0" is displayed.

If ▲ key is pressed in the RUN mode (when the counter shows "00"), the counter display changes to 01. The maximum torque value remains in the display and data sampling starts.

After completion of measurement, if MEM key is pressed in the PEAK HOLD mode (when the counter shows any value from 01 to 99), the measured data is stored.

The maximum torque value is held. To clear the value, press "C" key.

Up to 99 readings can be stored (displayed on the counter). By pressing ▲ key when the counter shows 99, the counter display changes to 00 and the display becomes in the RUN mode.

5-3 Data deletion

(1) To delete one data:

Press ▲ or ▼ key and display a data to be deleted. Press "C" key to delete the data.

(2) To delete data between two selected count values:

Press ▲ or ▼ key and display the last count value of data to be deleted. Then, press STAT key to display "ST". Press ▲ or ▼ key and display the first count value of data to be deleted. Then, press STAT key. With any of "n", "HI", "Lo", "Av", "r" or "S" on the display, press "C" key while pressing "STAT" key. The data between the two selected count values is deleted.

(3) To delete all stored data:

　　Turn off the power, and all stored data is deleted.

Cautions:

* Before deleting data, verify whether or not the data should be deleted.

* Before turning off the power, transfer all necessary data into other media.

5-4 Statistical processing function (number of samplings, maximum value, minimum value, average value, variation range, standard deviation)

(1) Press ▲ or ▼ key to display the last count in the data range to be subjected to statistical processing.

(2) Press STAT key once to display "ST". Press ▲ or ▼ key and display the first count in the data range to be subjected to statistical processing.

(3) If STAT key is pressed, the sampling number "n", maximum value "HI", minimum value "Lo", average value "Av", variation range "r" and standard deviation "S" in the specified data range are displayed in turn.

Cautions:

* The data values under 5% of the maximum capacity of the TME2 are not stored and they are automatically excluded from data to be processed.

5-5 Auto Memory/Reset

If the maximum measured value is held in the display and the load is released up to 5% of the maximum capacity of the TME2, after any (preset) time between 0.1 and 5.0 seconds, the measured value is stored and the counter is moved forward by one.

5-6 Auto zero adjustment

If "C" key is pressed in the RUN mode, the auto zero function is activated.

If the displayed value exceeds 5% of the maximum capacity at no-load condition, "Err9" is displayed.

<<When "Err9" is displayed>>

　　• Under no load condition, press "C" key.

　　- If the "Err9" message disappears, the TME2 functions properly.

• If the "Err9" message does not disappear, turn the power OFF, and then turn it ON again.

- If the "Err9" message remains displayed, the torque sensor or the plated circuit may have any problem.

5-7 Over-torque alarm

If the torque exceeds 110% of the maximum measuring range, bars appears on the display and flashes for protection of the instrument.

5-8 Error display

TME2 has a self-diagnosis function. When an error occurs, any of the error messages from Err1 to 9 is displayed.

<<When any of Err1 to 5 is displayed>>

• Turn the power OFF, and without touching any key, turn the power ON again.

- If the Err message disappears, the TME2 functions properly.

- If the Err message does not disappear, the TME2 needs repair. Contact your nearest distributor or TOHNICHI MFG. CO., LTD.

<<When Err8 is displayed>>

- The TME2 needs repair. Contact your nearest distributor or TOHNICHI MFG. CO., LTD.
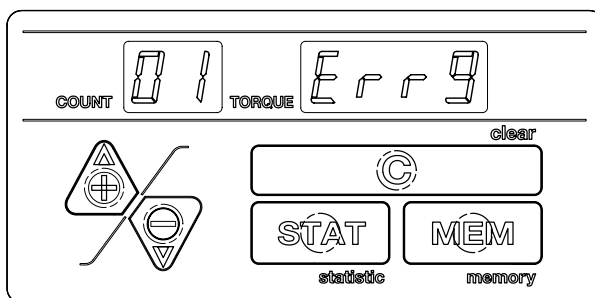
<<When Err9 is displayed>>

• Under no load condition, press "C" key.

- If the Err9 message disappears, the TME2 functions properly.

• If the Err9 message remains displayed, turn the power OFF and turn it ON again.

- If the Err9 message remains displayed, the TME2 needs repair. Contact your nearest distributor or TOHNICHI MFG. CO., LTD.

6 Settings

6-1 Auto Memory/Reset setting

While the counter shows "00", long-press STAT key for about 2 seconds. "0.0" on the display starts flashing. It is ready for setting.

Press ▲ or ▼ key to select any value in the range from 0.1 to 5.0 seconds, and press MEM key for setting. Now, it is ready for communication setting. If the manual memory/reset is required, however, press MEM key while "0.0" is displayed.
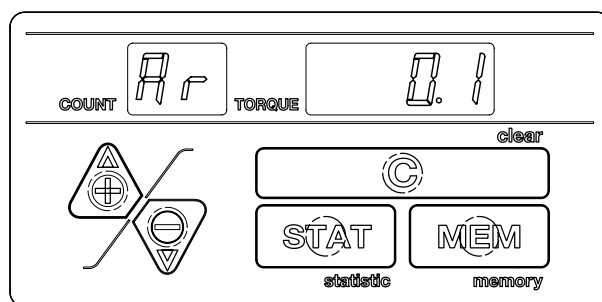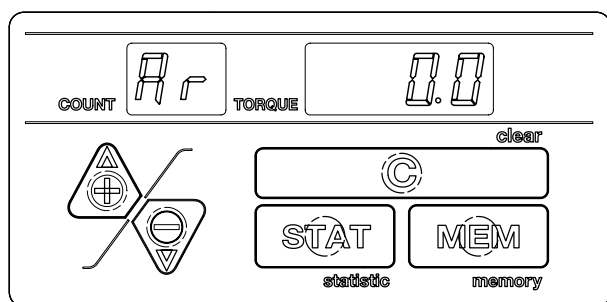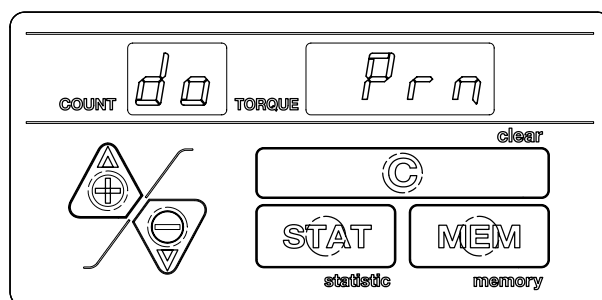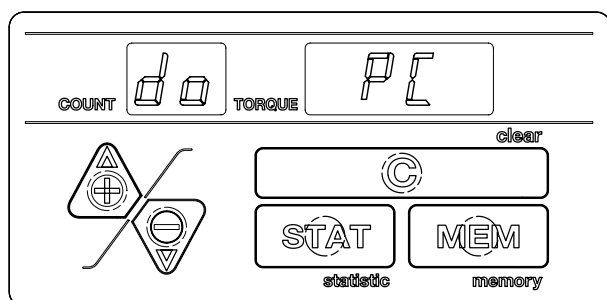
6-2 Communication setting

(1) Output format setting (Factory default: PC output)

For the RS232C output format, perform printer output or PC output setting.

Press ▲ or ▼ key and select "PC" for PC output or "Prn" for printer output. Then, press MEM key for setting. Now, it is ready for communication baud rate setting.
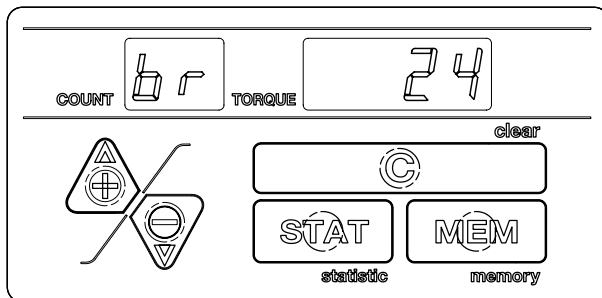
If "C" key is pressed, the setting is canceled and it is ready for measurement.

(2) Communication baud rate setting (Factory default: 2400bps)

To set the communication baud rate, press ▲ or ▼ key and select "24" for 2400bps, "48" for 4800bps, "96" for 9600bps or "192" for 19200bps. Then, press MEM key for setting. Now, it is ready for data length setting.
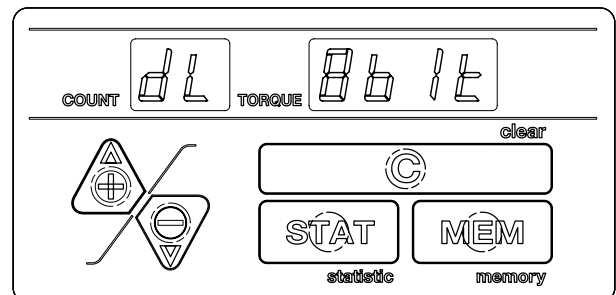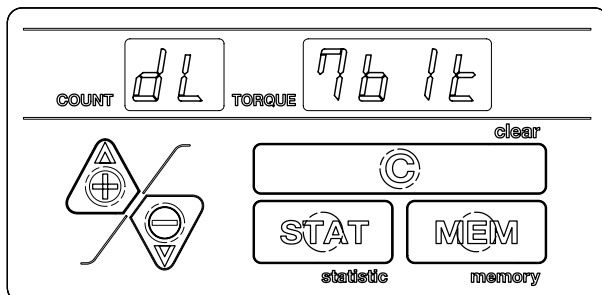
If "C" key is pressed, the setting is canceled and it is ready for measurement.
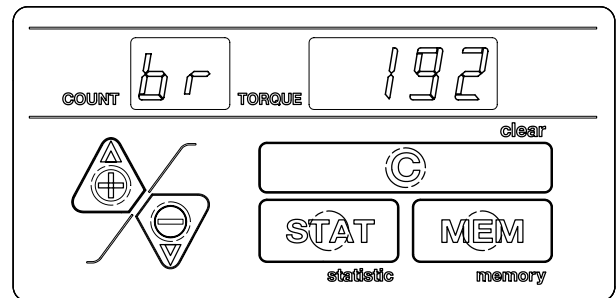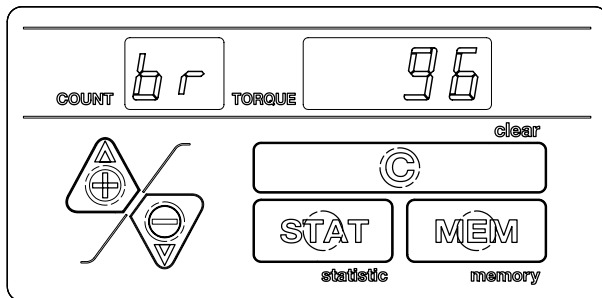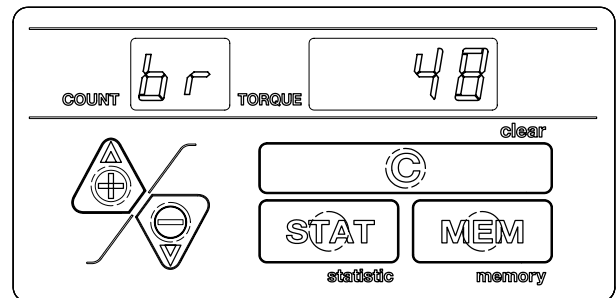
(3) Data length setting (Factory default: 7bit)

To set the data length, press ▲ or ▼ key and select "7bit" or "8bit". Then, press MEM key for setting. Now, it is ready for parity setting.
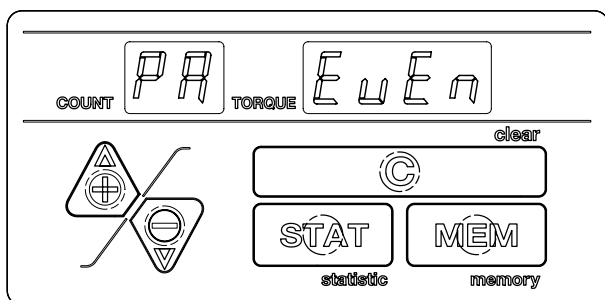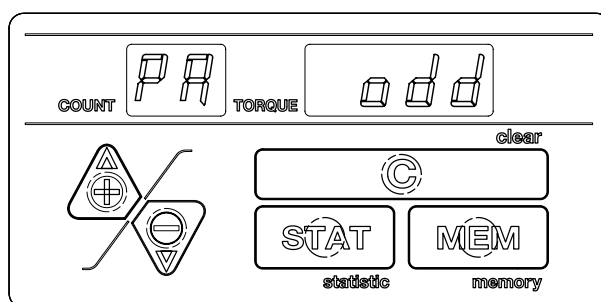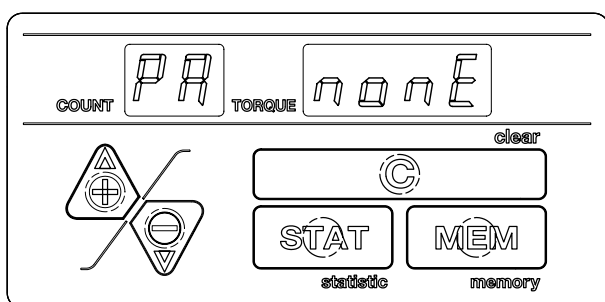
If "C" key is pressed, the setting is canceled and it is ready for measurement.

(4) Parity setting (Factory default: None)

To set the parity setting, press ▲ or ▼ key and select "nonE" for none, "EvEn" for even number or "odd" for odd number. Then, press MEM key for setting. Now, it is ready for continuous output setting.

If "C" key is pressed, the setting is canceled and it is ready for measurement.


(5) Continuous (unrestricted) output setting (Factory default: OFF)

To set the continuous output for RS232C, press ▲ or ▼ key and select "oFF" or "on". Then, press MEM key for setting. Now, it is ready for measurement.

If "C" key is pressed, the setting is canceled and it is ready for measurement.

If the continuous output is set, the displayed torque values are continuously output. In that case, the values are output in the PC output format even if the printer output has been set.
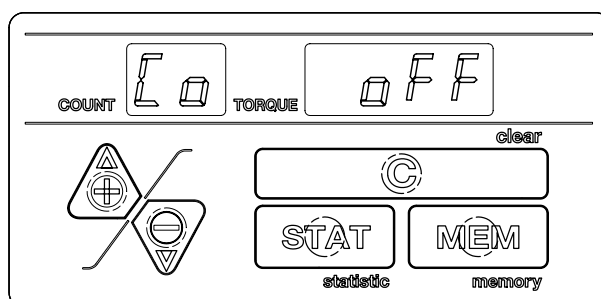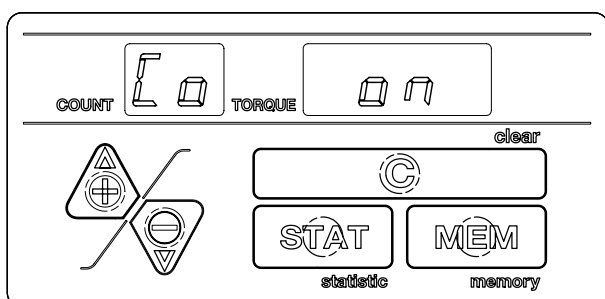
7 External Input/Output Function

7-1 Printing with the printer

Connect the TME2 and the Tohnichi printer (EPP16M2) with a printer cable (Catalog No. 382).

(1) Progressive printing

To print out data one by one, press MEM key. However, in the case of progressive printing, the results of statistical processing are not printed. When the Auto Memory/Reset is set, the results are automatically printed out.

(2) Continuous printing

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

The data, sampling number "n", maximum value "MAX", minimum value "MIN", average value "AVE", variation range "r" and standard deviation "s" in the selected range are printed out.

(3) Statistical processing printing

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

Only the statistical processing results in the selected range are printed out.

Continuous printing example

```
        1 : 1 2 3 . 4 c N · m
        2 : = = = = = c N · m
        3 : 1 2 4 . 4 c N · m
        4 : 1 2 5 . 0 c N · m
        5 : 1 2 3 . 2 c N · m
        6 : 1 2 3 . 6 c N · m
        7 : = = = = = c N · m
            – – – – – – – –
        n = 6
  M A X : 1 2 5 . 0 c N · m
  M I N : 1 2 2 . 0 c N · m
  A V E : 1 2 3 . 7 c N · m
    r   :       3 . 0 c N · m
    s   :       1 . 1 c N · m
```

If the measured value is "0" or "– – – – –" appears on the display of the TME2, the value is excluded in the statistical processing and not printed out, resulting in the printing of "= = = = = =".

7-2 RS232C input/output

(1) Data output format

Data form: RS232C-compliant

Transmission system: Start-stop synchronization serial

Baud rate: 2400/4800/9600/19200bps

Data length: 7bit/8bit

Stop bit: 1bit

Parity: None/Even number/Odd number

Format

R	E	,	0	1	,	1	2	3	.	4	CR	LF

Header		Counter		Displayed data (including decimal point)		Delimiter

(2) External output setting

Data output setting can be made by inputting any of the following commands on an external device.

M	0	CR	LF

Data is continuously output by 0.5 ms. (unrestricted output)

M	1	CR	LF

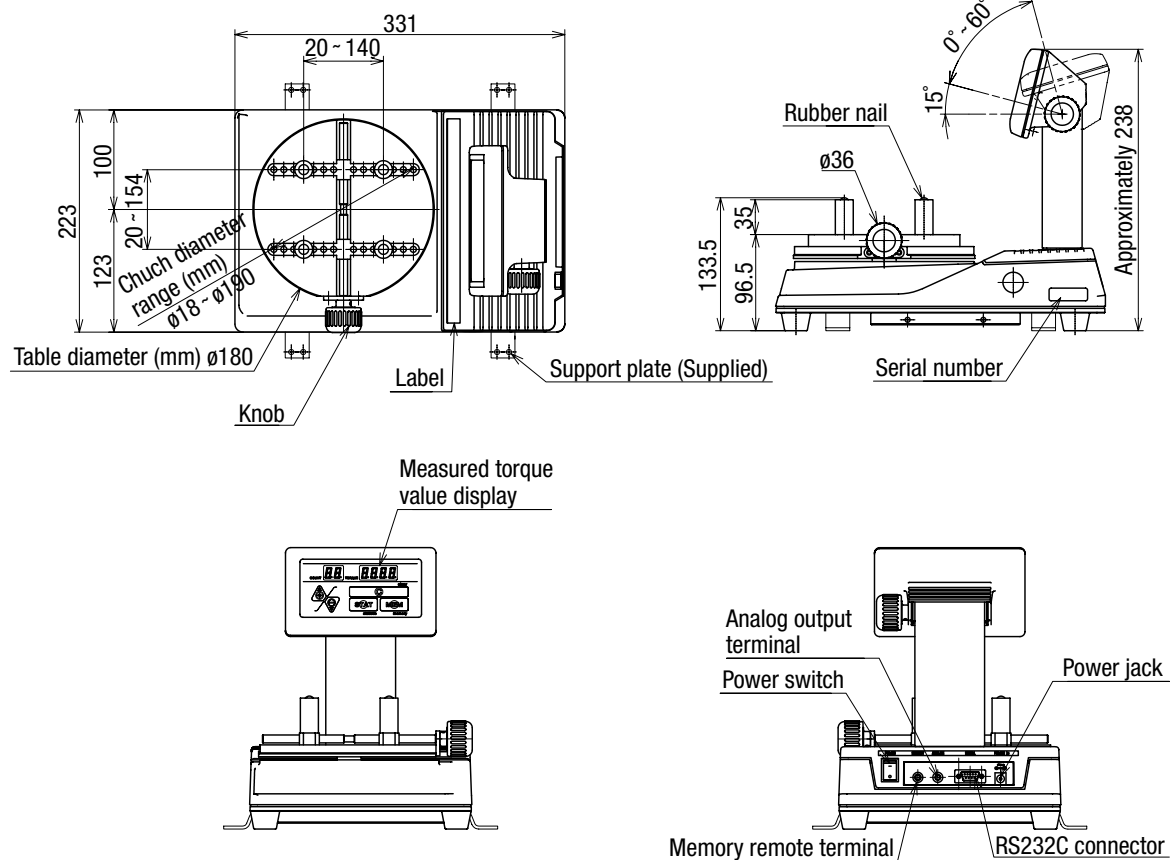One data is output.

M	2	CR	LF

Continuous data output is canceled.

7-3 Analog output

At the maximum load, about ±4.5V output from the analog output terminal is possible.

Use a high input impedance for connection.

* Terminal: RCA type connector

331

20 ~ 140

223

100

20 ~ 154

123

Chuch diameter
range (mm)
ø18 ~ ø180

Table diameter (mm) ø180

Knob

Label

Support plate (Supplied)

0° ~ 60°

15°

Rubber nail

ø36

133.5

96.5

35

Approximately 238

Serial number

Measured torque
value display

Analog output
terminal

Power switch

Power jack

Memory remote terminal

RS232C connector

Designs and specifications are subject to change without notice.