

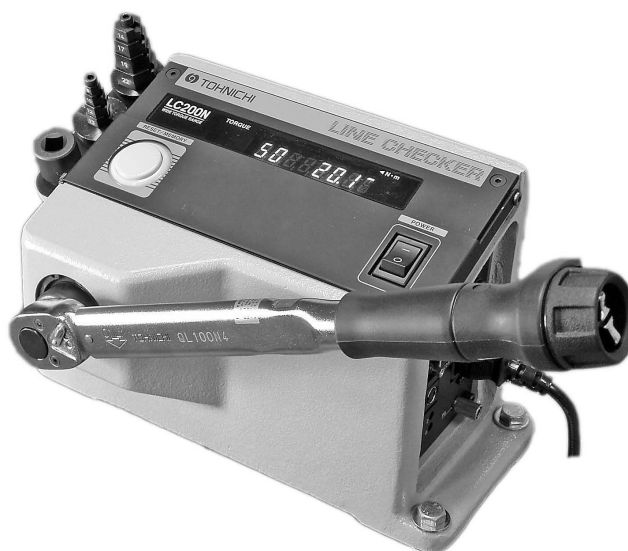
DIGITAL LINE CHECKER

**LC20N (LC200, LC200-A), LC200N (LC2000, LC2000-A)
LC1000N (LC10000, LC10000-A)**

PATENTED

OPERATING INSTRUCTION

LC20N, LC200N LC20N, LC200N Models



LC1000N LC1000N Model



To use this product properly and safely, please read this manual carefully before use. If you have any questions 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 line checker.
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 line checker 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 line checker on an unstable or shaky place such as a rickety table or slope.
The line checker or attachments (socket, ratchet adapter) may fall, resulting in injury.
- (10) Do not put this line checker 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 line checker 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 line checker 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 line checker to another place, be sure to turn off the power, remove the power plug from outlet and disconnect all connecting cables. When moving the line

checker, 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 line checker to conduct measurements beyond its capacity.

For safe and efficient operation, use this line checker 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 line checker, 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 line checker. If the line checker 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 wrench checker in an environment

other than that specified in the operating instruction.

- (4) Do not disassemble or modify this torque wrench checker.
- (5) Before use, make a pre-operation inspection and check the settings.

- (6) If this torque wrench checker 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 wrench checker fall or bump. It may result in damage or failure.

- (8) Use this torque wrench checker within the measurement range specified in the operating instruction.

- (9) Be sure to conduct a periodic inspection.

- (10) Before make measurement, make sure that "zero" is displayed.

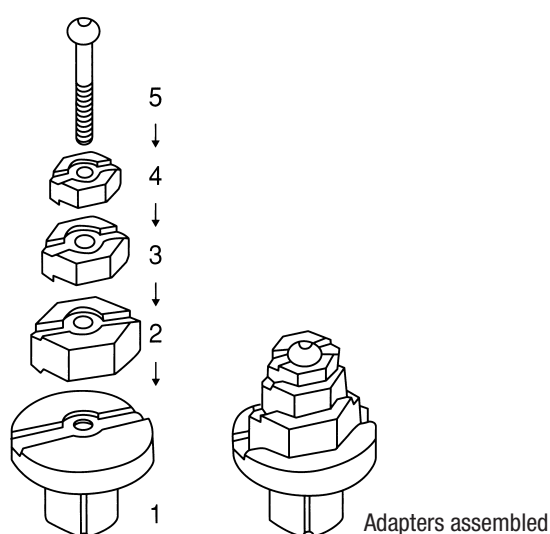
Should the line checker give out abnormal smell or catch fire during use, stop using it immediately. Then, move the line checker to a safe place and contact your nearest distributor or TOHNICHI MFG. CO., LTD.

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1 Features


- Economical and easy to operate, this torque wrench checker is suitable for use at the assembly lines or service facilities.
- The built-in clock keeps track of time and date when measurements were taken.
- Since initial peak torque is picked up by this checker, over torque of click type torque wrench, so called, second peak torque, does not affect the reading.
- Wide measurement range - one checker can measure many types of torque wrenches.
- The internal memory function stores 50 data. The stored data can be easily printed out by connecting the printer to RS232C output.
- Even in 3-digit display mode (PEAK), legible measurements are possible with accuracy of $\pm 1\%$.
- Adapters with hexagon heads that are free to combine can be combined according to the size of the torque wrench to be checked.
(Refer to Fig. 1.)
- Voltage requirements: AC100V to AC240V



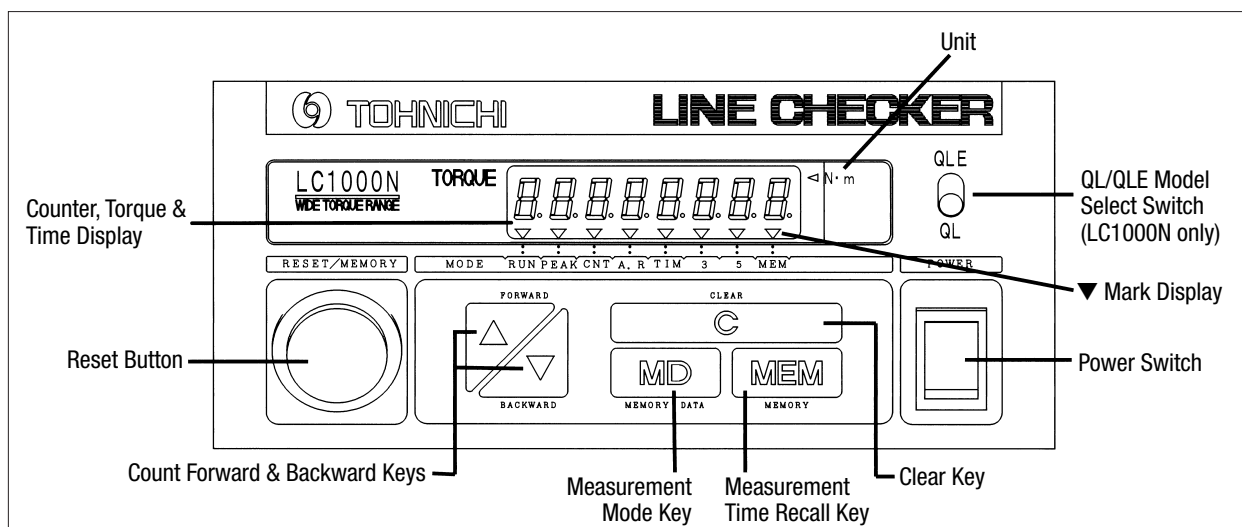
[Fig. 1]

- * Be sure to apply force at the grooved line or dot of torque wrench handle.
- * When calibrating a click type torque wrench with a vertical type torque checker, the head weight of the torque wrench should be added as error. When calibrating a dial or plate type torque wrench, the tare of the torque wrench is added as error. For more accurate calibration, a horizontal type torque wrench tester, such as model DOT, DOTE or TCC, with loading device is recommended.
- * To make zero-point adjustment, remove the torque wrench from the checker and press the "C" key on the display under unloaded condition.

2 Specifications

Newton Model		LC20N			LC200N			LC1000N		
		Auto Display Range	Unit	1 digit	Auto Display Range	Unit	1 digit	Auto Display Range	Unit	1 digit
Torque range at PEAK mode		0.500 to 0.995	N.m	0.005	5.00 to 9.95	N.m	0.05	50.0 to 99.8	N.m	0.2
		1.00 to 9.99		0.01	10.0 to 99.9		0.1	100 to 1000		1
		10.0 to 20.0		0.1	100 to 200		1	-		-
Torque range at RUN mode		0.500 to 20.000		0.005	5.00 to 200.00		0.05	50.0 to 1000.0		0.2
Metric Model		LC200			LC2000			LC10000		
		Auto Display Range	Unit	1 digit	Auto Display Range	Unit	1 digit	Auto Display Range	Unit	1 digit
Torque range at PEAK mode		5.00 to 9.95	kgf.cm	0.05	50.0 to 99.5	kgf.cm	0.5	5.00 to 9.98	kgf.m	0.02
		10.0 to 99.9		0.1	100 to 999		1	100.0 to 1000.0		0.1
		100 to 200		1	1000 to 2000		10	-		-
Torque range at RUN mode		5.00 to 200.00		0.05	50.0 to 2000.0		0.5	5.00 to 9.98		0.02
American Model		LC200-A			LC2000-A			LC10000-A		
		Auto Display Range	Unit	1 digit	Auto Display Range	Unit	1 digit	Auto Display Range	Unit	1 digit
Torque range at PEAK mode		5.00 to 9.95	in.lbs	0.05	50.0 to 99.5	in.lbs	0.5	36.8 to 99.8	ft.lbs	0.2
		10.0 to 99.9		0.1	100 to 999		1	100 to 735		1
		100 to 174		1	1000 to 1740		10	-		-
Torque range at RUN mode		5.00 to 174.00		0.05	50.0 to 1740.0		0.5	36.8 to 735.0		0.2
Direction		Clockwise 								
Accuracy		±1 % + 1 digit								
Display		Fluorescent Display Tube								
Data Memory		50 Data (Counter, Time, Torque Data)								
Measurement Mode		PEAK/RUN								
Changing the Number of Digits		3 Digits (PEAK)/5 Digits (RUN) by MD Key								
Zero Adjustment		"C" Key, Auto Zero by Power OFF/ON								
Data Output		Compliant with RS232C (Printer: Standard, PC: Inside Dip Switch)								
Reset		Manual/Auto [0.5 to 5.0 sec. Changeable every 0.1 sec.]								
Operating Temperature Range		0 to 40°C								
Socket		9.5 (Double Square) Female			12.7 (Double Square) Female			25.4 (Double Square) Female		
Power Requirement		AC 100 to 240 V 50/60 Hz								
Dimensions		W 278 x D 160 x H 167						W 500 x D 290 x H 186		
Bolt Pitches to fix Checker		244 x 96 4-ø11 (Hex Socket Head Bolt M10)						470 x 170 4-ø13 (Hex Head Bolt M12)		
Weight		About 10.5 kg						About 34 kg		
Accessories	Socket Adapter	No.270 9.5 (Male) x 6.35 (Female)			No.272 12.7 (Male) x 9.5 (Female)			No.274 19.0 (Male) x 12.7 (Female)		
								No.276 25.4 (Male) x 19.0 (Female)		
	Hexagon Head Adapter	No.282 [8,10,12,13,14,17 (each 1 pc.), Base Adapter (1 pc.), Driver Adapter (1 pc.)]			No.280 [8,10,12,13,14,17,19,22 (each 1 pc.), Base Adapter (2 pcs.)]			-		
	Power cable	2m x 2P Flat Plug								
	Fixing plate	-			-			Attached (Connected), Eyebolt M12		
Options		Battery Pack, Calibration Kit, Printer, Data File System, Supporting Board for Vertical Setting (for LC1000N)								

3 Description of Front Panel



QL/QLE Model Select Switch (LC1000N only)

Set the switch to QL or QLE according to the torque wrench to be measured.

In the QL mode, measurements can be made with the PEAK torque over 35N·m and within the range of 50 to 600 N·m. The maximum value on display is 600N·m.

In the QLE mode, measurements can be made with the PEAK torque over 80 N·m and within the range of 100 to 1000 N·m. The maximum value on display is 1100 N·m.

If measurement is conducted without setting the mode according to the torque wrench to be checked, the measured PEAK torque value is not stored in the LC. If the measured torque exceeds the maximum torque value on display, the display flashes on and off and a buzzer sounds.

RUN : The ▼ mark for RUN lights up when RUN (continuous) mode is selected.

PEAK : The ▼ mark for PEAK lights up when PEAK (maximum value) mode is selected.

CNT : The ▼ mark for CNT remains lit when the count is between 1 and 50.

AR : Auto reset (0.5 to 5 sec).
The ▼ mark for AR lights up when the auto reset mode is selected.

When the ▼ mark for AR is not lit, the system is in manual reset mode.

TIM : The ▼ mark for TIM remains lit when the measured time display mode is selected.

3 : The ▼ mark for "3" lights up when the PEAK mode is in use.

5 : The ▼ mark for "5" lights up when the RUN mode is in use.

MEM : The ▼ mark for MEM remains lit when data memory mode is in use.

▲ : Data memory recall (Count forward key)

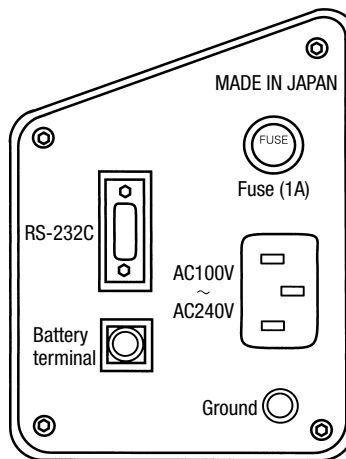
▼ : Data memory recall (Count backward key)

C : Key to clear the display value in PEAK mode (maximum value) and for auto-zero

MD : PEAK or RUN mode select key

MEM : Time data recall key

4 Right Side of Checker



5 Initializing

[To verify that the purchased torque wrench checker is free from defects, be sure to follow the procedures below. Before performing the procedures, remove the torque wrench.]

- 1) Connect between the AC inlet on the right side of the checker and the power supply using the power cable.
- 2) While pressing the "C" key, turn off and on the power switch on the front panel. (After the power switch is turned on, immediately release the "C" key.) The system is now initialized.

At this point, the display on the front panel shows:

Measurement unit: "-" mark indicates "N · m".

Number of digits on display: The ▼ mark for 3 (three figures) lights up.

Count (CNT): The ▼ mark for CNT lights up.

Clock (TIM): The ▼ mark for TIM lights up.

Manual/Auto reset: Manual reset mode

(The ▼ mark for AR is not lit.)

PEAK/RUN: The ▼ mark for PEAK lights up.

By initializing the line checker, the visual check of the fluorescent display tube and automatic checks of the functions of the front panel keys, internal RAM and auto-zero function are conducted.

If any abnormalities are detected, the display shows the error messages as follows:

Err1 to Err5 Membrane keys are faulty.

Err8 The internal RAM is faulty.

Err9 Auto zero, sensor, or A/D converter is faulty.

If Err1 to 9 are displayed, contact your nearest distributor or TOHNICHI MFG. CO., LTD.

6 Setting Measurement Modes

[After one measurement mode has been set, the system automatically goes to the next mode setting. Following the steps below, perform the consecutive operations. In the event of improper entry or operation, press the "C" key. The system will return to its initial state.]

[Setting example]

Manual/Auto reset: Auto reset (1 sec)

Date and time: April 24, 2001, 13:30:00

PEAK/RUN: PEAK

1) Turn on the power switch on the front panel.

2) To set Manual/Auto reset:

Press the "C", "MEM" and "MD" keys and the ▼ mark for AR lights up and "00" flashes. Then, set "1.0" sec by pressing the ▲ or ▼ key, and press the MEM key.

* If the MEM key is pressed while the ▼ mark for AR is lit and "00" is displayed, the manual reset mode will be set.

3) To set the date and time:

Set the flashing number for year at "01" by pressing the ▲ or ▼ key and press the MEM key.

Set the flashing number for month at "04" by pressing the ▲ or ▼ key and press the MEM key.

Set the flashing number for day at "24" by pressing the ▲ or ▼ key and press the MEM key.

Set the flashing number for hour at "13" by pressing the ▲ or ▼ key and press the MEM key.

Set the flashing number for minute at "30" by pressing the ▲ or ▼ key and press the MEM key. The clock starts ticking from 00 seconds. Then, press [MD]. The setting is completed.

7 Changing Individual Modes

[To change one mode only, use the following procedures.]

1) To change only the manual/auto reset mode:

Press the "C", "MEM" and "MD" keys and the ▼ mark for "AR" lights up and "00" flashes.

(If "00" is set, the manual reset mode will be set. If the reset time between 0.5 and 5.0 sec is set by pressing the ▲ or ▼ key, the auto reset mode will be set.)

Press the MEM key. While the clock is displayed, press the "C" key. Then, the display will return to the measurement display.

2) To change only the date and time:

Press the "C", "MEM", "MD" and again "MD" keys. The clock is displayed. Then, press the MEM key. The year flashes.

For the subsequent procedures, refer to "To set the date and time" in "6. Setting measurement modes".

8 Description of Functions

• Auto zero



When the line checker, LC20N or LC200N, is used for the range of 0 to 3.50 N·m in RUN mode and LC1000N for the range of 0 to 180 N·m, press the "C" key or turn the power switch off and on to activate the auto zero function. Before conducting the above operation, remove the torque wrench. If you make adjustment with a torque wrench attached, the tare of the torque wrench will be added as error. Removing the torque wrench will cause the zero-point to move to the negative side and the display will read "----".

If the display shows "----", press the "C" key.

• To store data

Press the RESET/MEMORY button on the front panel. Data is stored and the counter goes to the next number. After the counter reaches 50, it returns to 1. In this case, the old data under 1 is deleted. Data cannot be stored when the system in RUN mode.

• To delete only one stored data

Use the  or  key to obtain the data you need to delete on the display after removing the torque wrench. Then, press the "C" key or turn the power switch off and on.

• To delete all stored data

While pressing down the RESET button on the front panel, turn the power switch off and on. All data in the memory is deleted and the counter returns to 1.

• Overload warning

When loading exceeds the capacity of the checker, the display maximum value flashes on and off.

• Loading direction

This checker is available for clockwise direction only. If torque is applied counterclockwise, "----" will appear on the display. Releasing the load will bring the display back to 0.

• Measurement of click type torque wrenches

Set the PEAK/RUN mode to PEAK by pressing the MD key. (The number of digits on the display is automatically set to 3.)

• Measurement of beam or dial type torque wrenches

Set the PEAK/RUN mode to RUN by pressing the MD key. (The number of digits on the display is automatically set to 5.)

• When setting errors make operations impossible

Turn OFF the power switch, and then turn ON the power switch while pressing the "C" key. The system returns to its initial state. Refer to "6. Setting measurement modes".

• Backup batteries

This checker contains backup batteries to protect data against power failure.

(The backup period is about one year.)

Charge the batteries with the power of the checker keeping ON for about 30 minutes a day.

• Printing out measurement values

Connect the RS232C output connector on the side of the checker to the printer (EPP16M, optional) using the Tohnichi special cable (#551).

1) When the system is in auto reset mode:

Torque data input → Maximum torque value display → Auto reset → Printing

2) When the system in manual reset mode:

Torque data input → Maximum torque value display → Press the RESET button → Printing

• Print format

96/08/20	N·m
1 : 13:30	125
2 : 13:40	126
3 : 14:00	
50 : 15:25	126
1 : 15:35	127
2 : 17:00	125

Counter Time Torque value

← By turning on the power switch, the date and preset measurement unit will be printed out.

• RS232C specifications (Data transfer to PC)

Start-stop synchronization: Serial, Baud rate: 2400 bps, Data length: 7 bits, Parity: None, Stop bit: 1 bit

Data format

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

• Assembling hexagon head adapters

Select three frequently used size head adapters from the supplied hexagon head adapters. Assemble the three adapters onto the base and tighten the heads with the fixing screws. Then, place the assembled adapters onto the holder on the left side of the checker. (Refer to Fig. 1.)

• Using the battery pack

Turn off the power switch of the line checker. Connect the battery pack to the converter and then to the battery input on the right side of the checker.

By turning the switch on the battery pack to the OUTPUT position, the power of the line checker will be turned on.

When the red lamp on the battery converter lights up, charge the battery pack.

After being fully charged for 8 hours, the battery pack should provide about 5 hours of continuous use.

9 Cautions

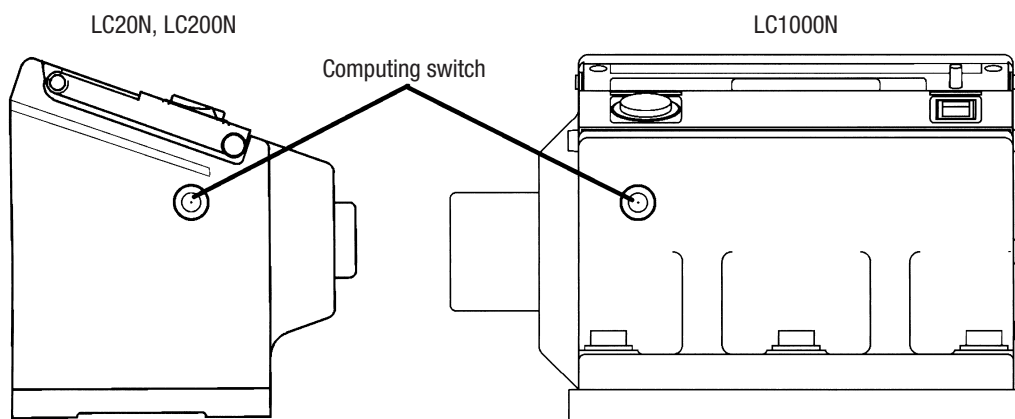
- Be sure to apply force at the grooved line or dot on torque wrench handle when calibrating torque wrenches.
- Do not load more than the maximum capacity of the line checker.
- Before use, make sure that the line checker has been fixed onto a sturdy workbench with four cap bolts.
For LC20N or LC200N, use hex socket head bolts (M10).
For LC1000N, use hex head bolts (M12).
- To make zero adjustment, remove the torque wrench and press the "C" key.
- After the power is turned ON, wait for 3 seconds. Then, if number is not displayed but any other marks or else are displayed, it indicates that the backup batteries are low in voltage. Charge the batteries with the power of the line checker keeping ON for 8 hours a day for three days. (The batteries will be fully charged.)

10 Optional Accessories

- Battery Pack
The battery pack allows the line checker to be used as a portable checker.
- Printer EPP16M2
- Calibration Kit

Supplementary Description of the Body Side

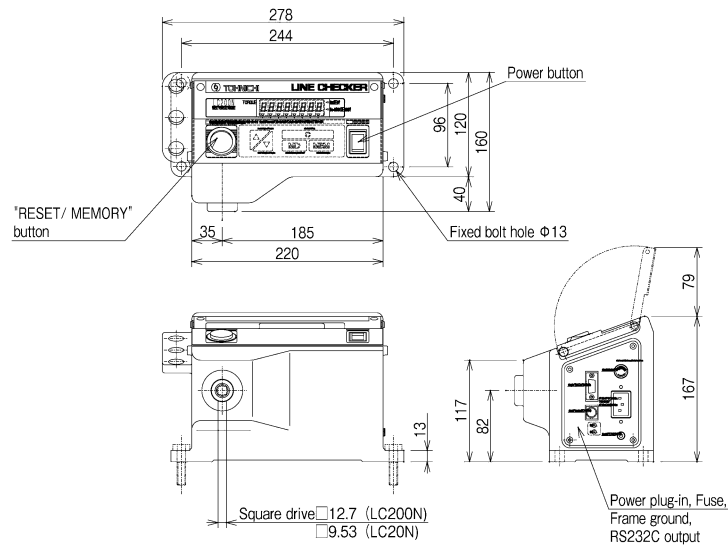
Computing switch on the line checker



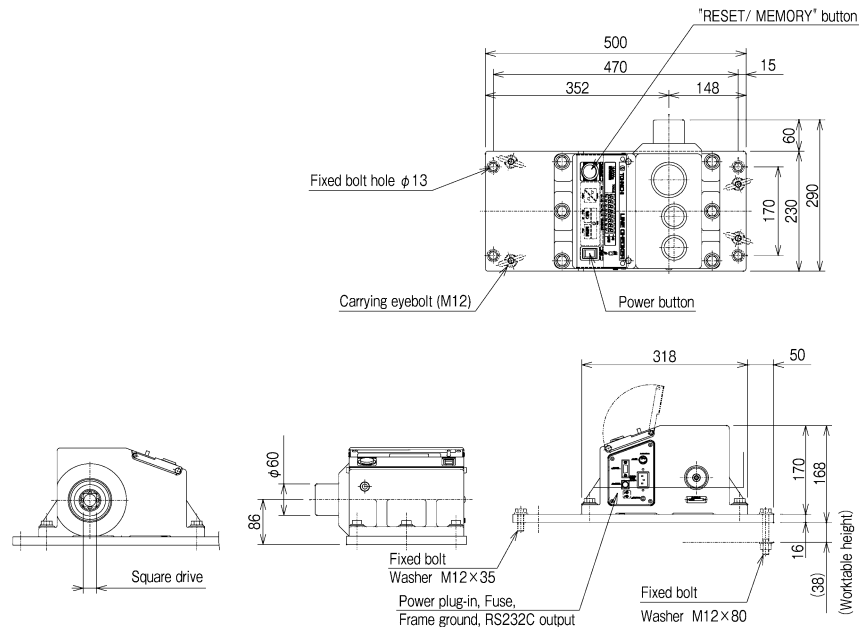
While the computing switch is pressed, the value multiplied by 10.1972 is displayed.

If data is printed out while the computing switch is pressed, "*" is printed after the display value.

■ LC20N, LC200N



■ LC1000N



Designs and specifications are subject to change without notice



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