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QUALITY ASSEMBLY TOOLS

High-precision Torque Meter

Instruction Manual

Applicable Models: AP-2, AP-10, AP-50, AP-100, AP-300

- *Thank you* for purchasing the CHP Assembly Tool. In order to ensure maximum performance and product life, **please read this manual before operating your torque meter.**

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1. General Safety Warnings



WARNING: Read all safety warnings and all instructions. Failure to follow the warnings and instructions may result in electric shock, fire and/or serious injury. Keep this manual readily accessible for reference.

■ Working area safety

- Keep working area clean and well lit.
- Do not operate power tools in the presence of flammable liquids, gases or dust.
- Keep the power tool away from children.

■ Electrical safety

To avoid risk of electrical damage/shock:

- When screen displays “LOBAT”, stop measuring and recharge the battery
- Turn off the torque meter before charging.
- Charging time should not exceed 6 hours.
- Only use Ni-MH battery.
- The meter should not be used during charging.
- The battery charger can only be used for charging the torque meter.
- Make sure the meter is off before connecting or disconnecting the charger.
- Disassemble of battery is not allowed.
- Never modify the plug in any way.
- Do not expose the power tool to wet conditions.
- Do not pull or damage the power cord.
- Use suitable extension cord when operating outdoor.
- Use a residual current device (RCD) when operating in a damp location.

■ Personal safety

To avoid injury during operation:

- Do not use the power tool when under influence of drugs, alcohol or medication.
- Ensure that the switch is in OFF position before connecting the power source.
- Remove and adjusting key or wrench before turning on the power tool.
- Keep proper footing and balance at all time.
- Do not wear loose clothing or jewelry. Keep hair, clothing and gloves away from moving parts.

2. Care/Maintenance

- Use the appropriate power tool for the application. Do not force the power tool.
- Do not use the power tool if the switch is malfunctioning.
- Disconnect the power source before making adjustments, changing accessories or storing the tool.
- Keep the tool away from children or untrained personnel.
- Periodically check for any misalignment or binding of moving parts, breakage of parts and any other condition that may affect the operation.
- Only use compatible power supplies and accessories.

3. Read Before Use

- To avoid damage to the torque meter, do not exceed the maximum torque value of each model.
- The torque meter shall not be used to measure continuous impact tools such as pneumatic screwdrivers or impact wrenches
- Only use suitable cable for connecting data output port
- Do not place heavy objects on the display panel.
- Do not operate or store the torque meter in high temperature/humidity environment. (Humidity:20% - 65%, proper temperature: 15°C – 35°C)

4. Declaration of Conformity (CE)

We, American Hakko Products, Inc., hereby declare that the products described in this manual are in conformity with the following Directive(s)/Standardization document(s):

EMC Directive 2014/30/EU

5. Product Information

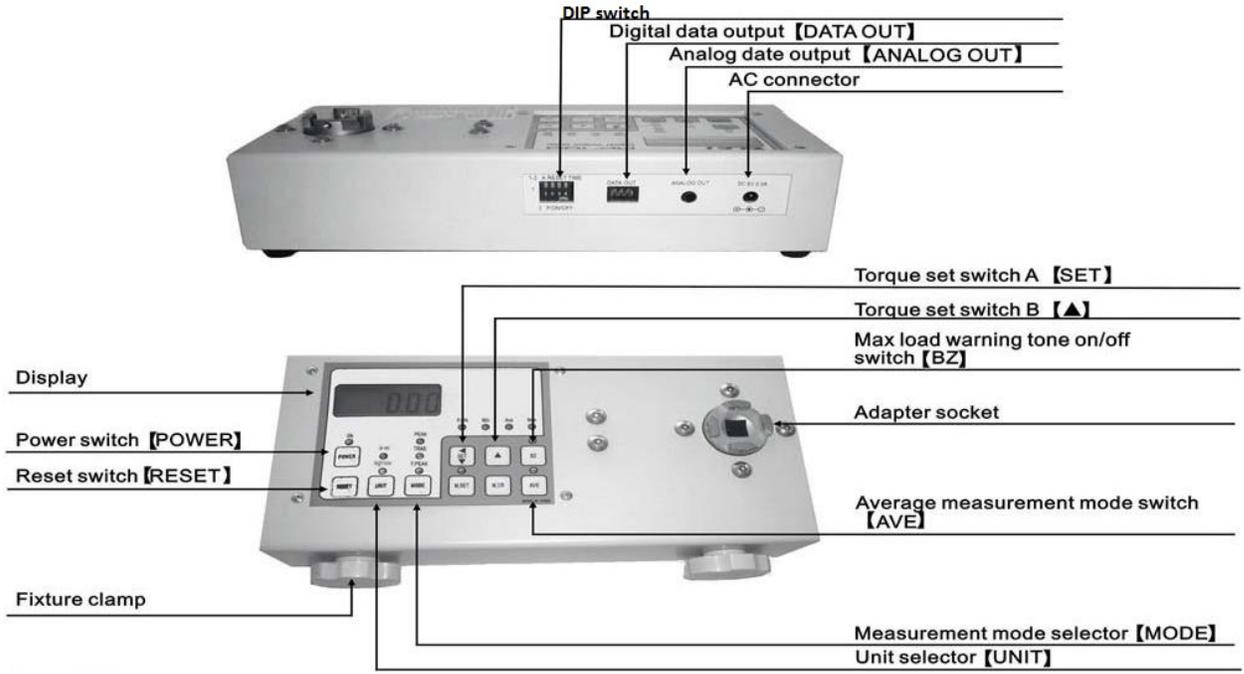
■ Packing List

- Carrying Case w/ keys
- Torque meter
- Power adapter/Charger
- ASJ Joint(s)/Run down adapter(s)
- Power plug adapters (3)
- Serial port cable
- Software CD
- Instruction manual

■ Specifications

Model		AP-2	AP-10	AP-50	AP-100	AP-300
Standard measuring range	(kgf-cm)	0.03~2.00	0.15~10.00	0.75~50.0	1.5~100.0	4.5~300.0
	(lbf-in)	0.026~1.73	0.13~8.68	0.65~43.4	1.3~86.8	3.91~260.4
Accuracy		In $\pm 0.5\%$ (199 digit or less ± 1 digit)				
Display		LCD digital display				
Measuring direction		Clockwise and Counterclockwise				
Measuring mode	PEAK	Lock display when the torque reaches peak value				
	TRACK	Display changes along with the current torque value				
	F.PEAK	Lock display when the torque reaches first peak value				
Power source		Ni-MH chargeable battery/ >300 times recharge				
Charging time		6 hours				
Working Time		8 hours				
AC adaptor		Input: AC100~240V · 60/50Hz Output: DC7.3~8V · 0.5A				
Socket Size		20mm				
Dimension (mm)		230 (L)x 120 (W)x 60 (H) mm				
Weight (kg)		2.0kg				
Caution		1. Not applicable for measuring semi-auto shut-off type electric and pneumatic tools. 2. The max measuring torque cannot exceed the standard measuring range.				

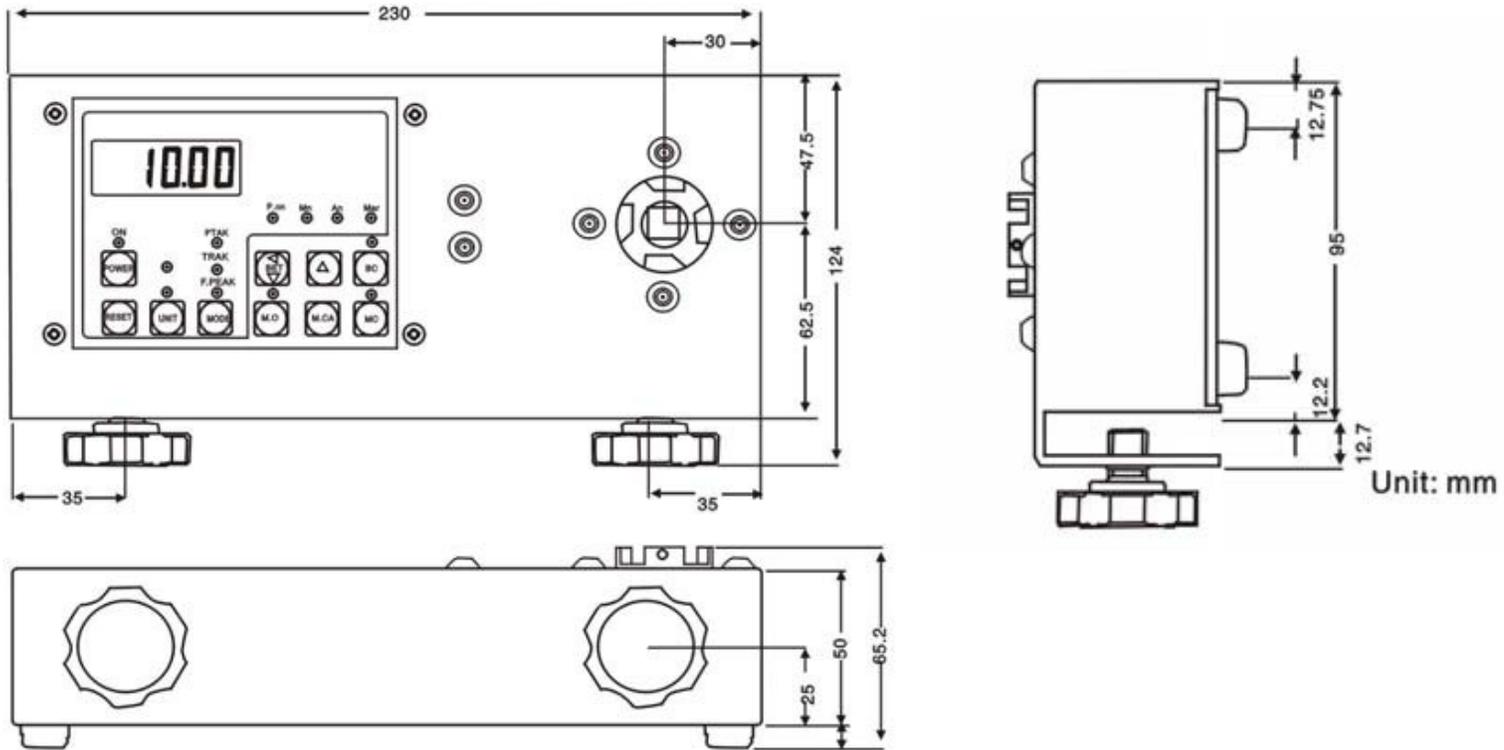
■Outline



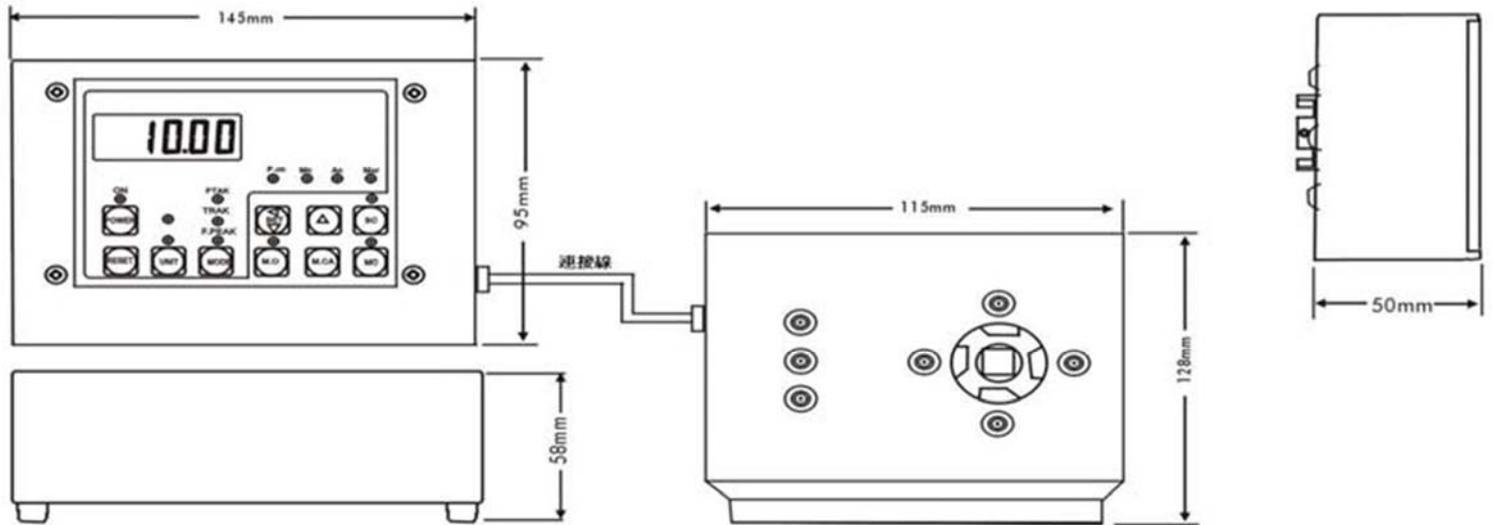
■Integrated Outline Drawing (AP-2/10/50/100)

Outline dimensions are the same for all models.

-Note: Technical specifications or appearance of torque tester are subject to alteration without notice.



■Separated Outline Drawing (AP-300)



6. Operation

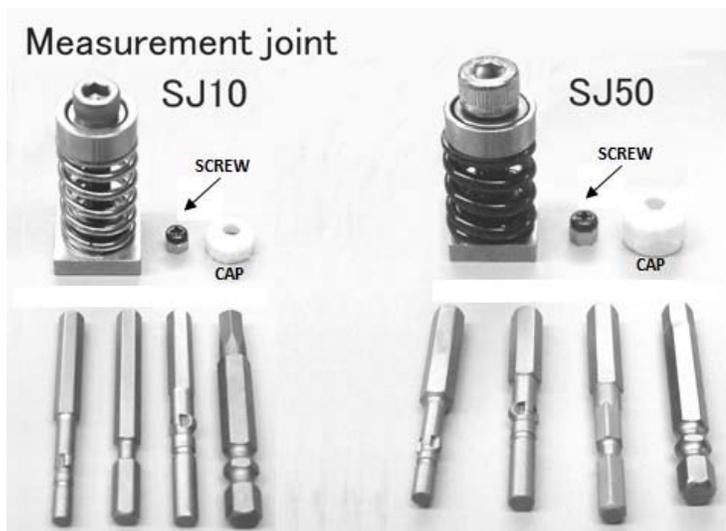
Component Name	Function																
POWER	Power switch: Turns on the torque meter (LED indicator on). Unit will automatically turn off after 10 minutes of non-usage.																
RESET	Return display data to zero.																
Display Screen	Display test unit <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>MODEL</th> <th>Kgf.cm</th> <th>N,m</th> <th>Lbf-in</th> </tr> </thead> <tbody> <tr> <td>AP-02/AP-10</td> <td>0.00</td> <td>0.000</td> <td>0.00</td> </tr> <tr> <td>AP-50/AP-100</td> <td>0.0</td> <td>0.00</td> <td>0.0</td> </tr> <tr> <td>AP-300</td> <td>0.0</td> <td>0.00</td> <td>0.0</td> </tr> </tbody> </table>	MODEL	Kgf.cm	N,m	Lbf-in	AP-02/AP-10	0.00	0.000	0.00	AP-50/AP-100	0.0	0.00	0.0	AP-300	0.0	0.00	0.0
MODEL	Kgf.cm	N,m	Lbf-in														
AP-02/AP-10	0.00	0.000	0.00														
AP-50/AP-100	0.0	0.00	0.0														
AP-300	0.0	0.00	0.0														
UNIT	Select corresponding measuring units based on customer preference :lbf-in<->kgf-cm																
MODE	PEAK: lock display when the torque reaches peak value (press RESET to cancel). TRACK: displays change to current torque value. F.PEAK: lock display when the torque reaches first peak value.																
AC connector	Used for battery charging.																
ANALOG OUT	Output port of analog voltage data.																
DATA OUT	Outputs measured data. This function contributes to use the torque tester in data management control system.																
DIP switch	Used for timing setting of automatic reset.																
SET A [SET]	Beep alarm will occur when reaching the maximum torque load value.																

SET B [▲]	Beep alarm will occur when measurement reaches preset value.
ON/OFF switch for alarm of the max. load[BZ]	Turn ON/OFF the alarm buzzer sound.
Average Measuring Mode [AVE]	Turn ON/OFF Average Measuring Mode.
Joint of adapter	Used for connecting torque tools when using test head or adapters of other types.

■ASJ Joint (Run-Down Adapter)

- ASJ joint is used for torque measurement of an electric driver.
- Choose the ASJ joint suitable for the measurement.

Model of ASJ joint	Part Number	Torque range (kgf.cm/lbf-in)	Model of Torque Meter
SJ-03	AT-L404004	0.2-2.5 / 0.17-2.17	AP-2
SJ-10	AT-L404001	1.5-10.0 / 1.3-8.68	AP-10/AP-50/AP-100
SJ-50	AT-L404002	5.0-50.0 / 4.34-43.4	AP-50/AP-100
SJ-100	AT-L404003	50.0-300.0 / 43.4-260.4	AP-300



■Note:

- Do not overload measurement joint.
- Please check that the bolt and bearing parts are greased before use.
- Please loosen the spring after using the torque meter.
- The suggested number of measurement for each joint is 2500, but please replace the joint if the following issue appears:
 - The spring is bent and deformed or the bolt is worn.
 - Unusual sound while operating.

■ Operation instructions

- First, check if the battery is sufficient. "LOBAT" will display on screen if battery is low.
Charge the battery for at least 3 hours but no more than 6 hours using the designated battery charger.

- Ensure that the torque meter is on a stable surface.
- Select desired measurement unit 【UNIT】 . (lbf-in \longleftrightarrow kgf.cm)
- Select desired measurement mode:
 - In "TRACK" mode, the display will show current torque value.
 - In "PEAK" mode, the screen displays the maximum measured value.
 - In "F. PEAK" mode, the screen displays the maximum value achieved for the first time in test period;
- Press 【RESET】 to clear display.

Zero adjustment: Select the 【MODE】 to "TRACK" and simultaneously press 【SET】 and 【▲】 for no more than 2 seconds. This can adjust the tester to zero. (Note: if pressed for more than 2 seconds, it will become another mode. In such case, please press 【RESET】 and repeat zero adjustment setting) .

- Please use test head to measure the torque of electric screwdriver according to detailed description below.
- After measurement, please be sure to turn off power supply and remove measurement joint from socket.

■ How to use SJ Joint to measure the torque of an electric screwdriver

- Insert SJ Joint into the adapter socket and then replace electric screw driver bit with suitable test head.
- Set measurement mode to "PEAK".

For measuring forward torque (Clockwise):

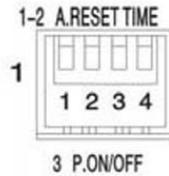
- If necessary, use reverse rotation on electric screw driver (REV) to loosen the joint spring to the point that the spring can be slightly rotated by hand.
- Press RESET to return all readings to zero.
- Set screwdriver rotation to forward, drive until it stops automatically and the spring has been tightened.
- When screw driver stops rotation, the display screen will display the torque value of this screw driver.
- Select screwdriver rotation to reverse to loosen the joint spring and then press RESET to clear readings.
- Repeat operations above.

For measuring reverse torque (counterclockwise):

- Set screwdriver rotation to forward, drive until it stops automatically and the spring has already been tightened at this moment.
- Press RESET to return all readings to zero.
- Set electric screwdriver rotation to reverse and loosen the joint spring.
- The display will show the reverse torque value of the screwdriver.

Function Description

DIP switch: Controls Automatic Reset



Switch		A.RESET TIME		P.ON/OFF	
		1	2	3	4
Time to auto-reset ¹	1 sec	ON	ON	—	—
	2 sec	ON	OFF	—	—
	5 sec	OFF	ON	—	—
	OFF	OFF	OFF	—	—
Data output	Printer ON ²	—	—	—	—
	Printer OFF	—	—	—	—

Note: -Make sure to switch off power supply before changing the DIP switch.
 -When using automatic reset function, the RESET key will not work.

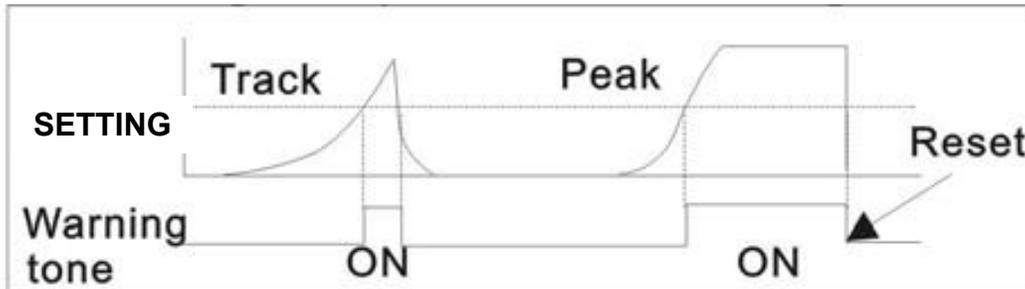
DATA OUT:

-Connect to PC and monitor measurements with data analysis software.

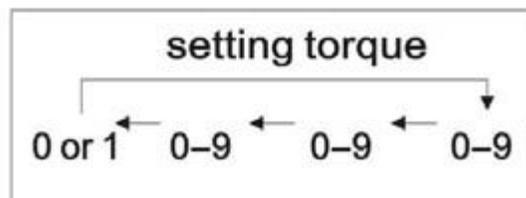
Torque Limits:

-You can set the maximum and minimum torque value on the torque meter. When a measured torque falls outside the required range, a beep alarm will occur.

Example: (Upper limit is set at 100)
 Alarm activates when the torque value is >100.



How to set the maximum/minimum torque value



- Press and hold the **【SET】** button for 2 seconds to enter maximum torque setting mode. Press and hold the **【▲】** button for 2 seconds to enter minimum torque setting mode. (A beep sound will be heard when entering torque setting modes)
- When tester is in torque setting modes, the four-digit display can be adjusted one at a time.

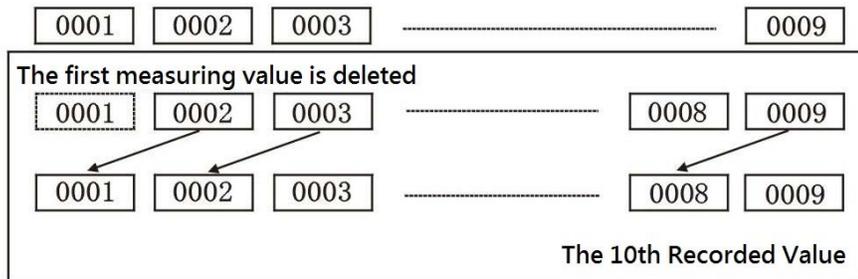
- Upward button **【▲】** : When in torque setting mode, press this button to increase selected value.
Note: The leftmost value can only be 0 or 1.
- Use **【SET】** to cycle through the digits.
- Press and hold **【SET】** for 2 seconds to save and exit the torque setting modes. Press **【RESET】** to cancel and exit the torque setting modes.

■Data Analysis

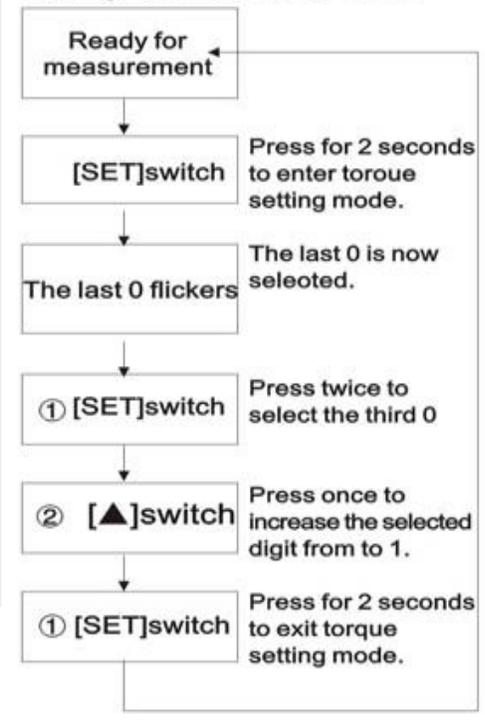
The torque meter can record up to 9 measurements and calculate the minimum, maximum and average torque value.

■Process of measuring

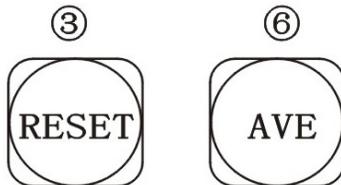
- Measurements will be recorded from 0001 to 0009.
- The torque meter only records the absolute value of each measurement. (No negative value)
- When more than 9 measurements are made, the oldest measurement will be deleted.



setting torque (Maximum) (Example: Changing a torque setting from "0000" to "0100")



■Buttons used during data analysis mode:



RESET button **【RESET】** :

-Press this button during data analysis mode to enter the measured data and reset.

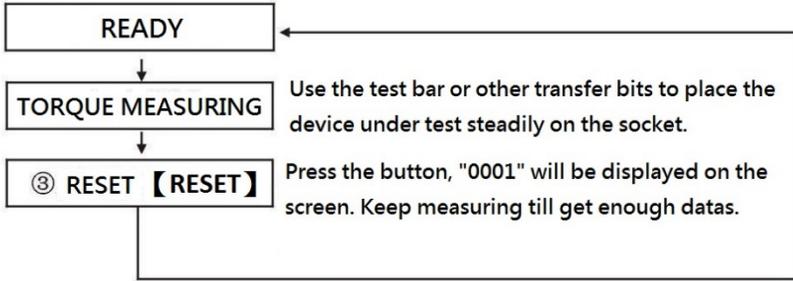
Average Value button **【AVE】**

-Press and hold this button for 2 seconds to enter or exit the data analysis mode.

-The LED light will be on during the data analysis mode.

-Press **【AVE】** to cycle through "Min", "Ave" and "Max" of recorded measurements.

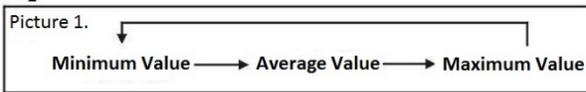
Example



Average Measuring data display

(The data will be displayed under average measuring mode; which will be deleted automatically after exit.)

⑥ The minimum, average and maximum value will be displayed while pressing the average button [AVE]



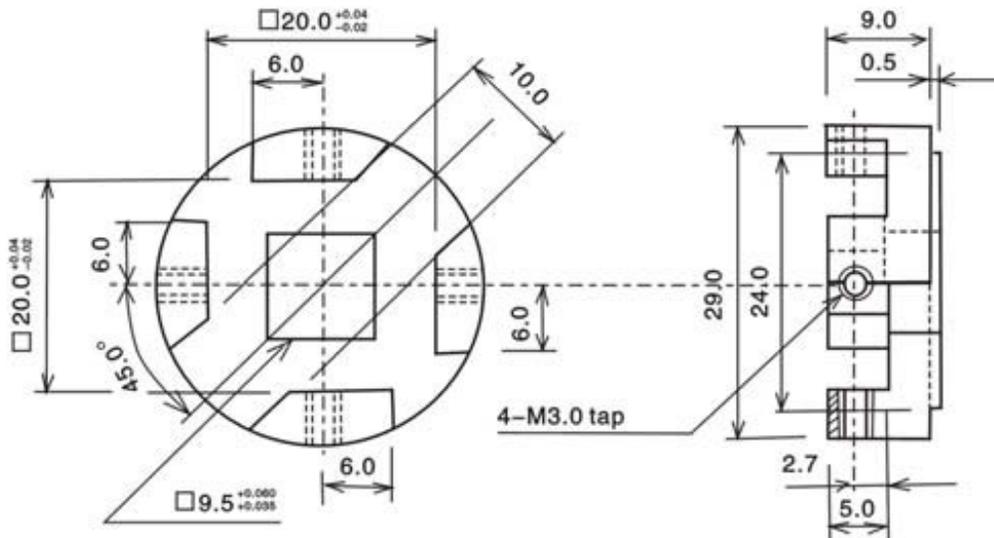
Note:

Make sure the measurement mode is set to "PEAK" or "F.PEAK".

The "UNIT" button will not work when meter is in data analysis mode.

■ Use of Adapter Socket

- Insert ASJ joint or tool head (except threaded rod) firmly into the socket for torque test.
- Do not use the adapter when **vertical** torque exceeds 10kgf-cm.
- Do not use this torque tester to measure impact tools, and follow all other torque measuring principles strictly.



7.Troubleshooting

- If the torque meter does not work properly, check the list below. If the issue can't be resolved, do not open the unit and contact one of our customer service as soon as possible.

Defect	Cause	Solution
“LOBAT” displayed	Low battery	Charge the battery for at least 3 hours but no more than 6 hours using the designated battery charger.
No displaying on the screen	The tester hasn't been used or the battery has been discharged for a long period of time	Switch off the power and charge the battery (no more than 6 hours), then turn it on to see if the display is normal. If the problem still exists, please contact the manufacturer or distributor.
Displayed value fails to return to zero	Zero setting is not calibrated	Complete the zero adjustment setting on page 8.
Display value constantly changing	“TRACK” mode is selected	Change to “PEAK” mode or “F.PEAK” mode
Battery cannot be charged	The battery connecting wire is not fully inserted into the socket	Check whether the connection is okay
	Wrong connection of wiring plug	Connect the battery charge socket If the problem still exists, please contact the manufacturer or distributor.
“LOBAT” is displayed again after complete charging	Battery life ended	Contact manufacturer or distributor
	Insufficient charging	Re-charge (at least 3 hours but not over 6 hours)
Screen displays random values	Can be caused by noise.	Press RESET button to clear the screen

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