

TORQUE CHECKER

MODEL	DI-1M-IP50
	DI-1M-IP200
	DI-1M-IPIP500

數位扭力計操作手冊

**DIGITAL TORQUE CHECKER
INSTRUCTION MANUAL**

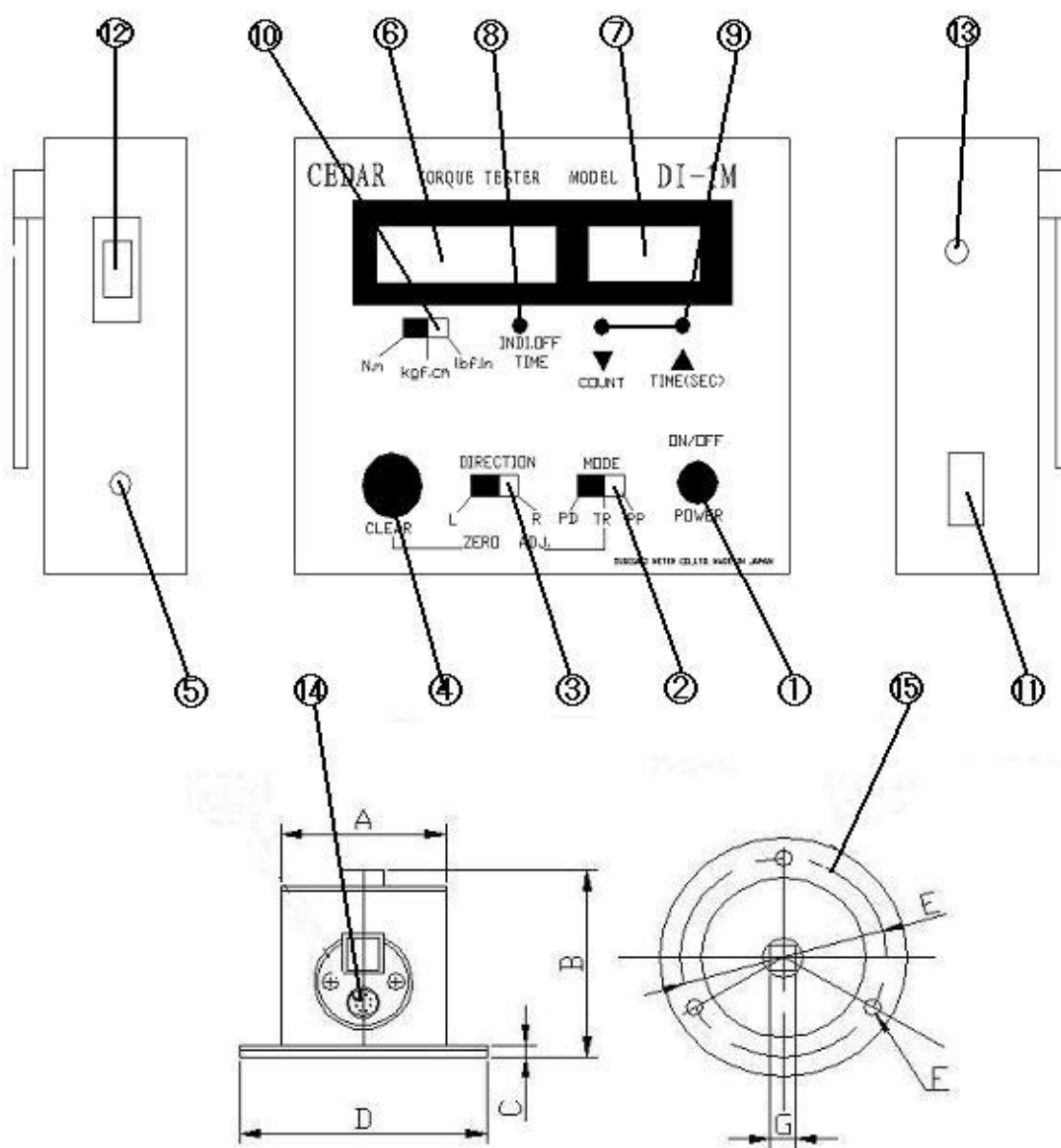
1. 安全警告

1. 工作場所保持乾淨
 - ◎雜亂的工作區域及臺面容易造成傷害。
2. 注意工作場所的環境。
 - ◎勿將扭力計置放於雨中或潮濕處。
 - ◎在固定溫度下(約 24°C)使用扭力計。
 - ◎工作場所照明良好。
 - ◎勿于有易燃液體或氣體之處使用或充電扭力計。
3. 請勿讓孩童靠近。
 - ◎除操作人員以外，皆不可靠近工作場所。
4. 請穿著適宜。
 - ◎勿穿著太寬鬆之衣服或佩戴首飾，以免操作工具時勾扯拉到。
5. 請謹慎操作。
 - ◎操作扭力計時，務必小心使用，注意操作方式和工作場所等相關事宜。
6. 請穩定的固定機身主體。
 - ◎當測試較大扭力時，請使用夾子或虎頭鉗等工具來固定起子，如此會較以手拿持安全,同時也可以雙手操控起子。
7. 請勿測試超過負荷量的扭力。
 - ◎若測試超過負荷量,會使儀器損壞甚至產生意外或傷害。
8. 請勿拆卸、撞擊或震動儀器。
 - ◎避免拆卸產品，因其為精密儀器。如扭力計因過度撞擊或震動而損壞，將無法正常運作同時可能造成意外或傷害。
9. 電擊警告。
 - ◎勿以潮濕雙手碰觸電源插頭，如此可能會遭到電擊。
10. 請用專用的充電器幫電池充電。
 - ◎使用非專用的充電器充電可能會引起火災或導致傷害。
11. 適當的充電。
 - ◎使用指示電壓充電，勿使用直流電或發電機充電，如此會產生高熱，引起火災。
 - ◎充電勿超過八小時，過量充電會引起爆炸，過熱和電池漏液，導致火災。
 - ◎在空氣流動處充電，充電時勿以布覆蓋。
12. 絕對不可將電池(嵌裝於扭力計內)投入火中。
 - ◎如此會導致爆炸或放出有毒物質。(丟棄電池的程式因依照當地之廢棄物處理法令，如果無相關法令，則應將電池送到專門回收處。)
13. 如有下列情況，應關上主開關並拔掉插頭。
 - ◎當扭力計沒有在使用或充電時。
 - ◎維修扭力計時。
 - ◎扭力計有可能發生危險時。
14. 請細心保養扭力計。
 - ◎為更好、更安全的操作，經常檢查測量接頭，勿使用畸形或壞掉的接頭。
 - ◎根據操作手冊更換零件。
 - ◎定期檢查電線和延長線，更換有損壞的線材。
15. 不可猛烈拉扯電線。
 - ◎不可搬運懸掛著電源線的儀器，也不可拉扯電線來拔出插頭。
 - ◎不可將電線放在高溫、油膩或有銳利邊緣之處。

16. 檢查有無因零件損壞所造成的功能損失。
 - ◎在進一步使用儀器前，仔細檢查有無損壞，能否正常運作和可以運用的功能。
 - ◎ 檢查任何有可能會影響運作的零件是否正常。
17. 請由專業人員來修理儀器。
 - ◎勿隨意更改此產品。
 - ◎應在購買的經銷商處維修產品，若由非專業人員修理此產品，有可能會無法正常運作甚至引起意外或傷害。
18. 請使用專用配件或附件。
 - ◎勿使用本操作手冊規定以外的配件或附件。
19. 不使用時需小心存放。
 - ◎扭力計需存放在乾燥且兒童無法接觸之處、或是安全的地方。在運送時可再利用此產品原有之包裝盒。

2. 外觀

① POWER SW (電源開關)	⑨ COUNT TIME (計數器設置開關)
② MODE (測試模式選擇開關)	⑩ UNIT SW (計量單位選擇開關)
③ DIRECTION (方向開關) (L/R)	⑪ RS-232C OUTPUT (數據接頭)
④ CLEAR (歸零開關)	⑫ ANALOG OUTPUT (類比式數據輸出介面)
⑤ AC ADAPTOR (充電孔)	⑬ DETECTOR INPUT (測試接頭) (輸入)
⑥ LED DISPLAY (液晶顯示器)	⑭ DETECTOR OUTPUT (測試接頭) (輸出)
⑦ BLOW COUNT DISPLAY(打擊次數顯示器)	⑮ SOCKET (測試底座)
⑧ INDI-OFF TIME (顯示時間設置開關)	



3. 規格

型號		DI-1M-IP50	DI-1M-IP200	DI-1M-IP500	
測定範圍	N · m	0.30~50.00	30.0~200.0	120.0~500.0	
	Kgf.cm	3.0~500.0	300.0~2000	1200~5000	
	Lb.in	2.61~434.7	260.8~1739	1043~4347	
正確度		測量值±0.5%(F.S)			
顯示器		4 位半 LED 顯示			
測量方向		正、反時鐘方向			
測量模式	P-P peak	保持載重最高值			
	T-R track	會依載重的變化顯示。歸零用			
	P-D peak down	會保持在載重從上升至下降的瞬間			
歸零		按清除鈕成爲零			
數據規格	數據輸出	適用 RS232C			
電源	自動關機	放置 5 分鐘後會自動 OFF			
	電池配置	Ni-Cd 電池 1.2V×5 (1200mA)			
充電時間		8 小時以內			
連續使用時間		約 13 小時			
電池壽命		充電 300 次以上			
專用充電器		輸入：AC110V 50/60Hz 3W / 輸出：DC7.25V (120mA)			
尺寸	顯示器	150 (W) ×115 (D) ×40 (H)			
	傳感器	A	Φ 50	Φ 60	Φ 80
		B	63	78	103
		C	10	15	20
		D	Φ 90	Φ 110	Φ 140
		E	Φ 74	Φ 90	Φ 116
		F	3*Φ 6.5	3*Φ 9	3*Φ 10.5
		G	9.5 方頭	12.方頭	19 方頭
重量	顯示器	約 602 g			
	傳感器	約 632 g	約 2.3 kg	約 3.5 kg	
電纜線		標準 1 m			

※請勿使用測超出扭力計測量範圍的扭力。

※(傳感器尺寸請參考第 3 頁 TORQUE CHECKER 傳感器尺寸圖)

4. 準備與測量方法

4.1 安裝方法

如圖「外觀」所示，配合各端子的凹凸部，將 測試接頭（輸入） 及 測試接頭（輸出） 端子用附屬的電纜線予以連接。尤其是 測試接頭（輸出） 端子，用手指握緊電纜線端子上部的黑色部份插入，直至聽到卡聲為止。另外要拔下 測試接頭（輸出） 端子時，握住電纜線端子的銀色部份，拔下即可。

高扭力測定時，會有被彈回的可能，故需利用孔穴等來確實固定。在扭力計的背部，附有固定孔，使用者可將此扭力計固定。

4.2 測定方式的說明

利用 測量模式選擇開關，配合使用的目的，有三種方式的選擇。

- ① PP (peak 測定) 峰值模式：顯示測量到的最大扭力值。
- ② TR (track 測定) 變值模式：顯示即時的扭力值。
- ③ PD (peak down 測定) 初值模式：顯示地個峰值，需配合歸零開關使用。

4.3 測量方式

- ① 打開電源，壓按電源開關約 1 秒左右。
- ② 先確認顯示部顯示面板是否為 0。若沒有，則將 測量模式選擇開關(MODE)轉為 TR 並按壓 清除鍵(Clear)，進行歸零。
- ③ 當要設置計算打擊次數時，可利用定時計數器 (Count Time) (▲▼) 設定時間；定時計數器能計算固定的時間內計數打擊多少次。進行測試時可以測出工具的異常
- ④ 確認方向開關 (DIRECTION) 是否選擇正確，若欲測試方向與方向開關不同，不會顯示其扭力值。 R：順時針方向；L：逆時針方向
- ⑤ 在傳感器設定，欲要測定的工具，並在傳感器接近欲要測定工具的負載扭力，就會開始進行②測定。
- ⑥ 確認工具的動作正常，並停止後，讀取顯示部的扭力測定值，完成測定的作業。
- ⑦ 完成測定的作業後，按壓 清除鍵(Clear)，顯示會被清除成為 0。若要繼續測定，則從②項開始重復以前的作業即可。

4.4 自動歸零設定 (設定時間、清除顯示數值。)

設定方法：

- ① 按壓內置開關 INDI.OFF TIME 設定自動歸零的時間。
- ② 顯示器畫面會顯示 0.0C。每按 1 次按鍵則數值會變；直至欲設定的數值處停止時，會回復成測定狀態。
- ③ 在 3 秒鐘以內未完成設定的場合，請從①開始再重復操作。顯示數值最低為 0.0 秒，最高為 3.0 秒當顯示 0.0C 則表示取消自動歸零的功能。設定秒數後靜待數秒，儀器會自動進入待測狀態。

※設定時間的選擇 0.0C→0.1C→0.5C→1.0C→1.5C→2.0C→2.5C→3.0C→0.0C 迴圈。

※ PP 測定是自 30 digit 以上、PD 測定是自 50 digit 以上開始作動。

5. 資料傳輸 (僅限 P-P、P-D 模式)

資料的傳輸是以 RS-232C 為傳輸的依據。故需用適合於 RS-232C 的印表機或電腦等設備來配合資料的傳輸；在每次測量完畢按歸零開關時（或機器自動歸零時），扭力計會自動將測得的資料經傳輸裝置輸出到電腦上。

※搭配用的傳輸裝置為選購產品。

6. 資料的傳輸

在測試完成後按 清除鍵(Clear)同時會將資料傳輸。

7. 充電

本扭力計放置 10 分鐘以上沒有操作時會自動切斷電源。

當顯示器上出現 -- L -- 字樣時表示扭力計電量不足，需再進行充電。

請關閉扭力計電源，以隨機配備的充電器，接妥正確的電源與扭力計充電孔即可進行充電。充電時間請勿超過 8 小時。以免造成電池過熱、漏液甚至燃燒等傷害。

8. 服務保證

本產品在購買後一年內若有因生產或運送過程瑕疵而產生之故障情況，本公司無條件提供修理服務。

若有以下情況，則在保證期間內修理必須付費。

- ◎ 不當使用、修理或重組儀器而導致故障。
- ◎ 在購買後因摔落等事故而導致的故障。
- ◎ 因天然災害、污染和不正常的電壓所導致的故障。

9. 調修服務

本產品於出廠前皆已做過可靠且符合國際標準的準確度校正，但為維持扭力計的精確度，應將扭力計作定期的校驗。本公司另提供專業並符合標準的調修服務，唯保證期間外的校驗服務得另收費用

購買時或校正後附帶文件：

- ◎ 校正報告表。
- ◎ 校正標準追溯表。

10. 疑難排除

不良情況	發生原因	處理方法
用測定方式 PP—PD 液晶螢幕無法固定數值	有設定 Auto clear，自動歸零裝置	請再次確認 Auto clear 的機能設定專案。（Auto clear 的機能會以 10 digit 以上的負載扭力作動）若無此必要時，請設定在 0.0C。
雖將電源開關 ON，而 LO BATT 顯示後電源即斷掉	充電不足	請用所附的專用充電器，依規定的充電時間充電。
依規定的充電時間充電後，雖輸入電源，仍無顯示。	長期間未使用，則內部的電池會完全放電。	請將 AC 充電器接續後，按壓側面的 SYSTEM RESET 按鈕，就會複歸。複歸後，將測定方式開關置於 TR 的位置，然後按壓 CLEAR 按鈕，使顯示為 0。

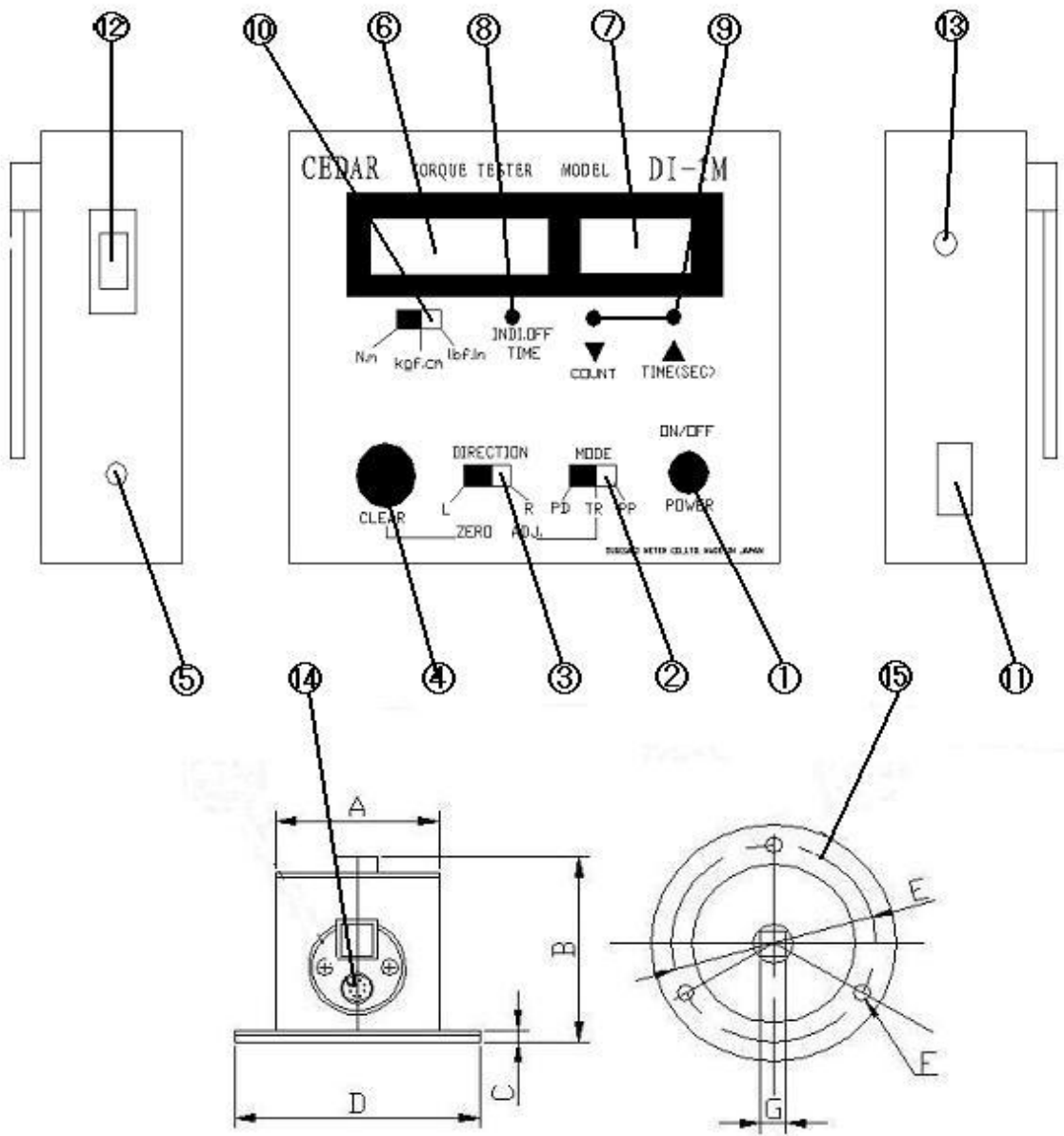
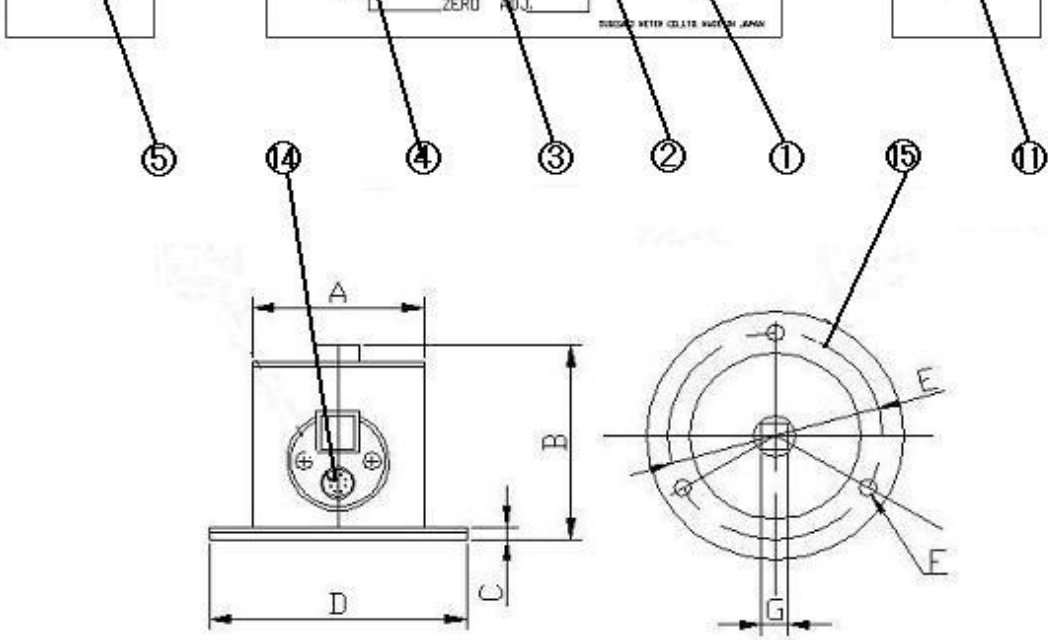
本產品若功能上發生不良狀況時，請依上表進行確認。經對照處理仍無法解除時，請向公司或經銷商提出修理的申請。

1. Caution for safety

1. Keep work area always clean.
 - Cluttered areas and benches may invite injuries.
2. Consider work area environment.
 - Do not use torque meter in the rain or in the damp or wet place.
 - Use the product at a place left at constant temperature (about 24°C).
 - Keep work place well lighted.
 - Do not use or charge the product in presence of flammable liquids or gases.
3. Keep children away.
 - Keep any person other than the operator(s) away from work area.
4. Dress properly.
 - Do not wear loose clothing or jewelry, which may be caught in moving parts.
5. Work with the most care.
 - When using the product, carefully work, with consideration to how to handle, how to work, work environment, etc.
6. Fix main body firmly.
 - When operated for measuring a large torque, use clamps or a vise, etc.
 - It is not only more safe than holding by hand but also makes it possible to grip the torque wrench by both hands.
7. Do not apply a torque exceeding the permissible load.
 - If applied beyond the permissible load, it may cause damage to the detector, resulting in accident or injury.
8. Do not disassembly, shock and vibrate this product.
 - Avoid disassembling the product that is a precise instrument. If the torque meter is damaged by excessive shock or vibration, the product may not only show the full performance but also result in accident or injury.
9. Caution to electric shock
 - Do not touch power plug by wet hand. It may cause electric shock.
10. For charging the battery be sure to use only exclusive charger.
 - Using a charger other than specified may cause a fire or injury.
11. Charge properly.
 - Charge on the indicated voltage. Do not use DC power or engine generator. It may cause abnormal heat, resulting in a fire.
 - Keep the charging time not longer than 8 hours. Overcharge may bursting, overheat and liquid leakage, resulting in a fire or injury.
 - Charge in a well-ventilated place. While being charged, do not cover with cloth.
12. Never throw the battery (built-in the torque meter) into fire.
 - It may cause burst or give off toxic substance. (The procedure for scrapping the battery shall be followed in accordance with local or regional law on waste disposal. If there is no local or regional law on waste disposal, be sure to dispose of the battery at a recycling shop.)
13. In the following cases, turn off the main switch and disconnect the plug from outlet.
 - When not used or charged;
 - When repaired;
 - When any other danger is expected.

14. Maintain torque meter with care.
 - For better and safer performance, check measuring joints regularly and use ones whose tips are free from deformation and wear down.
 - For replacement of accessories follow the instruction manual.
 - Inspect cords and extension cords periodically and if damaged, replace them.
15. Do not handle cord violently.
 - Do not carry the product hanging by cord or draw out socket from outlet by pulling cord.
 - Do not put cord near to a hot, oily or edgy part.
16. Check for absence of damaged parts.
 - Before further use of the product, carefully check for no damage, normal operation, or intended functions.
 - Check whether or not any other components that may affect its operation are normal.
 - Replace parts according to the instruction manual.
17. Have the product repaired by the specialized dealer.
 - Do not modify this product.
 - Repair should be made always by the dealer where you purchased the product.

If repaired by any person with no knowledge or skills of repair, it may not only show the full performance but also may cause any accident or injury.
18. Use only the specified accessories and attachments.
 - Do not use any accessories and attachments other than ones specified in this instruction manual.
19. Store properly when not in use.
 - Store the torque meter in a dry place and in a height out of children's reach, or secured area.
 - To transport the product, reuse the packing case with which this product was delivered.
20. The cautions on use of a main part and a detector
 - The display part and the detector are separated, and this product is proofread and managed by the same serial NO. Be sure to use it by same serial NO.



3. Specification

MODE		DI-1M-IP50	DI-1M-IP200	DI-1M-IP500	
Measuring range	N · m	0.30~50.00	30.0~200.0	120.0~500.0	
	Kgf.cm	3.0~500.0	300.0~2000	1200~5000	
	Lb.in	2.61~434.7	260.8~1739	1043~4347	
Accuracy		±0.5%F.S			
Display		4.5 figures of LED			
Measuring direction		CW;CCW			
● Measurement mode 3 way	P-P peak	Peak load value hold.			
	T-R track	Indication of real time torque value.			
	P-D peak down	Indication peak down point and hold.			
Auto clearance		Setting time peak down point and hold			
Memory data		Serial interface RS232C (Baud rate : 9600)			
Auto power save		5 minutes no use, automatically switch off.			
Power supply		6 VDC (Ni-Cd chargeable battery 1.2V×5cells)1200mAh			
Charging time		From empty – Less than 8hours			
Continuous working time		About 13hours			
Battery life		chargeable for 300 times or more However, it varies depending on operating conditions.			
Exclusive charger		INPUT : AC110V 50/60Hz 3W / OUTPUT : DC7.25V (120mA)			
Size	Display Part	150 (W) ×115 (D) ×40 (H)			
	Detection Machine	A	Φ 50	Φ 60	Φ 80
		B	63	78	103
		C	10	15	20
		D	Φ 90	Φ 110	Φ 140
		E	Φ 74	Φ 90	Φ 116
		F	3*Φ 6.5	3*Φ 9	3*Φ 10.5
		G	9.5 sq	12.sq	19 sq
Weight	Display Part	602 g			
	Detection Machine	632 g	2.3 kg	3.5 kg	
Connection Cord		1 m			

4. Preparation and the measuring method

4.1 The connection method

A detector input terminal and detector output terminal is connected in attached cable code. Each terminal should unite a concavo-convex part and insert it. Insert especially a detector output terminal until it pushes firmly the black part portion of the cable terminal upper part with a finger and sounds it. And when you remove a detector output terminal, pinch the silver portion with cable terminal and extract.

4.2 Installation

Since a detector may be brandished at the time of high torque measurement, a detector should use a fixed hole etc. and fix it firmly. A bodystand is in the reverse side of a indicator. A indicator can be made slanting if a bodystand is stood.

4.3 A setup in the measuring mode

The 3 following modes can be chosen with the setting measuring MODE switch in the measuring mode. It unites with the use purpose and please choose.

- (1) PP (peak measurement) : The maximum under measurement is always displayed.
A setting of torque value can be used in this mode.
*PP measurement operates from 30 or more numerical value.
- (2) TR(track measurement) : The value of the load torque concerning detector is displayed as it is.
- (3) PD(peak down measurement) : Value when load torque value changes from a rise to descent is displayed. When you apply re-load, carry out after pushing a clear button.

4.4 A setup of the measuring direction

Set up the measurement directions L (left) or R (right) with DIRECTION switch.

4.5 Measuring method

- (1) Turn on POWER switch.
*Switch operation is a push type and is pushed for about 1 second (At the time of OFF).
- (2) It checks that the display part is zero. If it is not zero, measuring MODE select switch is set to TR, push CLEAR key, and perform zero adjustment.
- (3) It is set as the time which wants to count the number of blows with a COUNT TIME setup switch.(▲▼) About a blow count : It counts how many times it hit within fixed time.
The abnormalities of a tool can be judged by managing the number.
- (4) It is measurement start, when a tool to measure into a detection part is set and load torque is applied.
- (5) It checks that operation of a tool has been completed normally, the measurement torque value of a display part is read, and it is a measurement end.
- (6) After a measurement end, if CLEAR key are pushed, a display will be cleared by zero. When continuing measurement, it repeats from (2).

4.6 A setup of INDI-OFF TIME

Time selection of zero reset can be performed in this measuring instrument, without pushing a clear button.

Insert and push a thin stick etc. into the hole of an INDI-OFF TIME portion.

Since display time is displayed in the order of 0.0/0.5/1.0/1.5/2.0/2.5/3.0, choose either.

Since 0.0 is usually the mode, it pushes a clear button and becomes display zero.

*PP measurement operates from 30 or more numerical value.

*PD measurement operates from 50 or more numerical value.

5. Date output (use only P-P · P-D Mode)

5.1 Data format

Date transfer is RS-232C output conformity. Data can be outputted to the printer corresponding to RS-232C, or a personal computer etc.

Spec.

Spec.	Data bit length	Start bit 1 + data bit 8 + stop bit 2 + NO parity							
	Baud rate	9600bps							
	Connector form	D-Sub-9pin							
	Connector spec.	No. 3 pin : Data output / No. 5 pin : GND							
18	OOO	OE	20	+/-	OOOOO	20	OF	OOOOOO	OD
※	SO	Space	Mark	value	Space	SI	Unit	CR	
	All data 21								

CAN : Cancellation

Measured value : A decimal point is also included. The last is a space when there is no decimal point.

1 0 . 0 0 → 10.00 SI.

Unit : In the case of N·m etc., the remainder space

N . m → N·m (k g f . c m → kgf·cm)

Pulse : The number of blows within a set time

P : example 10P=10Pulse

S : Seconds

CR : Carriage return

△ cautions An interface cable is used for connection of a computer.

Unite with a computer and prepare a cable.

Please inquire about a cable of a dealer where you purchased the product.

5.2 Data output method

Data is outputted whenever it pushes CLEAR key after a measurement end.

6. About charge

If this measuring instrument is left 5 minutes or more or battery capacity stops being sufficient, -L- will be displayed and a power supply will be turned off automatically. Charge should be by inserting the connector of the charger of exclusive use in AC ADAPTOR terminal. The fully charge is in the state which turned OFF the power supply switch, and takes about 8 hours. Do not perform charge of 8 hours or more. (It may become the cause of the fire by a burst of a battery, generation of heat, and liquid leak, or an injury by fault charge.)

7. About system reset

After a Ni-Cd battery discharges completely (when not using it for a long period of time), even if it charges and it turns on a power supply, CPU in equipment may not start. If you become such a situation, please push a system reset button at once. It will be in an initial state. (it is the same as that of the time of purchase) A system reset button is in the inside of a main part.

8. Guarantee

It is allowed to fix gratuitously, if the fault which will originate in manufacture, transportation, etc. of our company within one year after a purchase should occur, although product was manufactured under sufficient quality control.

In the following case, it becomes the charge also within a guarantee term.

- Failure by the error, and unjust repair and unjust reconstruction and damage on use
- Failure by fall etc. and damage after a purchase
- Failure by the natural disaster, pollution, and unusual voltage and damage

9. Calibration trust service

Periodical calibration is required in order to manage the accuracy of torque meter. By our company, the with the high reliability traced to the national standard is performed, and in order to use it within accuracy, I recommend you of one year. I offer a result of calibration document, a certification on calibration, and a traceability system figure by demand. (Periodical calibration is a charge.)

Documents appended at the time of product purchase
Result of calibration document
Certification on calibration document
Traceability system figure

10. Checkpoint when being Troubled

- Before judging it as failure -

When functional fault arises, please check based on a table, without judging it as failure immediately. By the corresponding processing, when fault is not canceled, please tell repair to our company or a store.

In addition, it is allowed to make the guarantee term of torque tester into one year from a purchase. However, also in an onerous case, it is according to the contents of repair.

The situation of torque tester	It does not hold by measurement mode PP-PD.
The cause of generating	It is used by setting up an auto clearance.
The processing method	Please check the setting item of an auto clear function again. When you do not use an auto clearance, please set it as <u>0.0C</u> .

The situation of torque tester	Even if it turns on a power-supply switch, a power supply will go out immediately after LOBAT display.
The cause of generating	Charge is insufficient.
The processing method	Regular time charge is carried out using the exclusive charger appended.

The situation of torque tester	Even if it turns on a power supply after charge of regulation time, it does not display.
The cause of generating	If it is not used for a long period of time, internal battery will carry out full electric discharge.
The processing method	If AC adapter is connected and the S.RESET button of the side is pushed, it will return. After a return, please make a measurement mode switch the position of TR, push a clear button and make a display into zero.

<p>如有疑問請與經銷商聯繫</p>	 杉崎計器株式会社 
--------------------	---