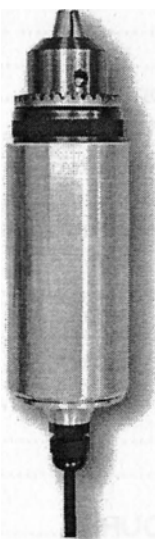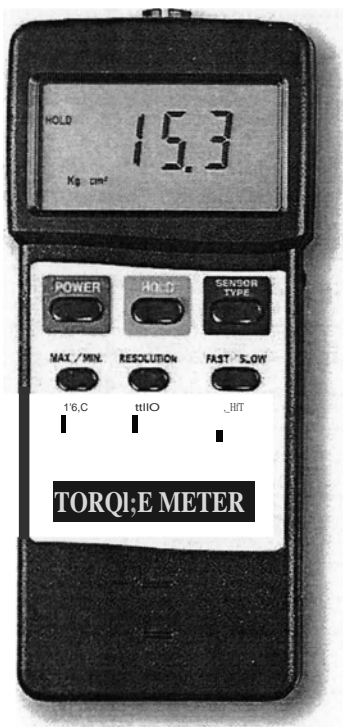# *15 Kg-cm*

TORQUE METER

Your purchase of this TORQUE METER TACHOMETER marks a step forward for you into the field of precision measurement. Although this TORQUE METETR is a complex and delicate instrument, its durable structure will allow many years of use if proper operating techniques are developed. Please read the following instructions carefully and always keep this manual within easy reach.

OPERATION MAN UAL

TABLE OF CONTENTS

1. FEATURES

* Professional torque meter with 15 Kgf-cm torque probe,
   full set.
* 3 kind display unit select button of Kgf -cm, LBf -inch
   and Newton -cm on the front panel.
* Data hold button to freeze the desired reading.
* Peak measu rement to hold the peak value.
* Selecting the high resolution or low resolution.
* Fast or Slow sampling time selecting by push button.
* Record Maximum and Minimum readings with recall.
* RS 232 computer interface.
* Super large LCD display, easy readout.
* Microcomputer circuit, high performance.
* Separate torque probe, easy operation.
* Auto power off saves battery life.
* Built-in low battery indicator.
* Heavy duty & compact housing case.
* Complete set with the hard carrying case.

2. SPECIFICATIONS

2− 1 General Spee,ᶠⁱ1cat1ons

Display	61 mm x 34 mm supper large LCD display. 15 mm (0.6") digit size.
Measurement	Torque value, peak value hold, data hold, Max. & min. value.
Unit	Kgf-cm, LBf-inch, Newton-cm.
Maximum measurement range	15 Kgf-cm, 13.02 LBf-inch, 147.1 N-cm. *N = Newton*

Accuracy	$\pm$ (1.5 % **+** 5 d)

Resolution	*High resolution*
	  0.01 Kgf-cm
	  0.01 LBf-inch
	  0.1 N-cm * N $=$ Newton
	Low resolution
	  0.1 Kgf-cm
	  0.1 LBf-inch
	  1 N-cm * N $=$ Newton

Sensor	Exclusive torque sensor.
Circuit	Exclusive microcomputer circuit.
Data hold	Freeze the desired readinq.
Peak hold	To hold the peak value.
Memory	Maximum & Minimum value .
Overload capacity	22.5 Kgf-cm max. 19.53 LBf-inch max. 220.1 N-cm max.
Power off	Auto shut off, saves battery life, or manual off by push button.

Sampling time	Fast/Slow select.
	  Fast : Approx. 0.125 second.
	  Slow : Approx. 0.334 second.

Data output	RS 232 serial output.
Operating temperature	0 ∘**C** to 50 ℃ (32 ℉ to 122 ℉).
Operating humidity	Less than 80% RH.
Power supply	Alkaline or heavy duty type DC 9V battery, 006P, MN1604 (PP3) or equivalent.
Power consumption	Approx. DC 12 mA.
Weight	Meter 225 g (0.50 LB) . Probe 665 g (1.46 LB).

Dimension	*Meter :* 180 x 72 x 32 mm (7.1 x 2.8 x1.3 inch) . *Torqueprobe:* Round 48 mm Dia. x 160 mm.
Accessories included	* Instruction manual.................... 1 PC. * 15 Kg torque probe...................1 PC. * Pinion.......................................1 PC. * Carrying Case...........................1 PC.
Optional accessories	* Software (Windows version, data record & data acquisition) ....SW-U101-WIN * RS232 cable UPCB-01

2-2 *Display Unit/Max. range/Resolution*

Display unit	Max. range	High resolution
Kg cm	15 Kgf-cm	0.01 Kgf-cm
LB inch	13.02 LBf-inch	0.01 LBf-inch
N ern	147.1 N-cm	0.1 N−cm

Unit	Max. range	Low resolution
Kg cm	15.0 Kgf-cm	0.1 Kg-cm
LB inch	13.0 LBf−inch	0.1 LB−inch
N ern	147 N−cm	1 N-cm

N＝ Newton

3. FRONT PANEL DESCRIPTION

Fig. 1
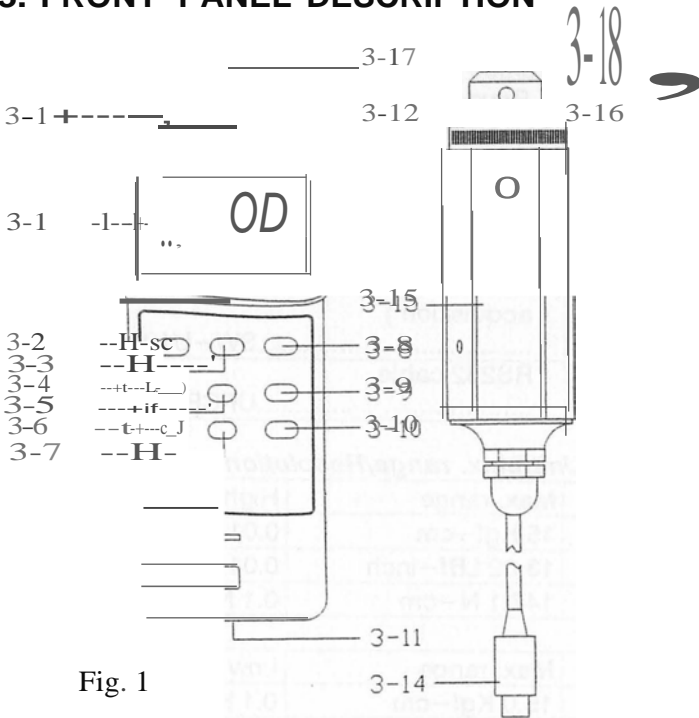
3-1 Display
3-2 Power Button
3-3 Hold Button
3-4 " Max./Min. " Button
3-5 Unit Button
3-6 Peak Button
3-7 Resolution Button
3-8 Sensor Type Button
3-9 Zero Button
3-10 Fast/Slow Button
3-11 Battery Compartment /Cover
3-12 Sensor Input Socket
3-13 RS-232 Output Terminal
3-14 Sensor Cable Plug
3-15 Torque Sensor Body
3-16 Gear
3-17 Cramp
3-18 Pinion

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4. **MEASURING** PROCEDURE

1) Plug in the " Sensor Cable Plug " (3-14, Fig. 1) to
   meter's " Sensor Input Socket " (3-12, Fig. 1).
2) Power on the meter by push the " Power Button " (3-2, Fig. 1).
3) Push the " Sensor Type Button " (3-8, Fig 1) to check if
   the meter's sensor type is same as the external torque sensor.

   Push the "Sensor Type Button ': the LCD will show
   "15 Kg cm ".

4) Unit Button
   Push the " Unit Button " (3-5, Fig. 1) to select the unit
   Kgf -cm, LBf -inch or N-cm (Newton -cm).
5) Resolution Button
   Push the " Resolution Button " (3-7, Fig. 1) to select the
   High resolution or Low resolution.

   ### *Select h"1gh resol utt•on*

Display unit	Resolution
Kg cm	0.01 Kgf-cm
LB inch	0.01 LBf-inch
N ern	0.1 N-cm

   * N = Newton

   ### *Select low resolution*

Display unit	Resolution
Kg cm	0.1 Kg-cm
LB inch	0.1 LB-inch
N ern	1 N-cm

   *N = Newton

6) Fast/Slow Button
   The " Fast/Slow Button " (3-10, Fig. 1) is used to select
   the fast sampling time or slow sampling time.
   * Fast sampling time, display will show the "F "indicntor.
   * Slow sampling time, display will show the " S " indicator.

7) To connect the " Cramp " (3-17, Fig. 1) to the measured installation and use the " Opinion " (3-18, Fig. 1) to lock the " Gear " (3-16, Fig. 1). Ref. Fig. 2 & Fig. 3.
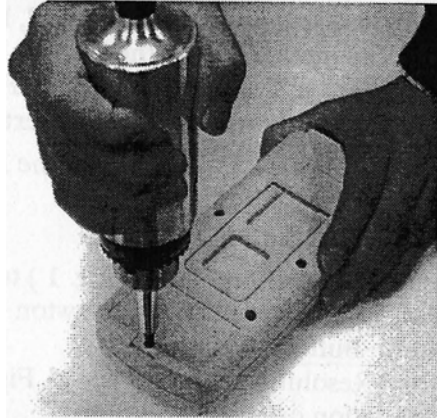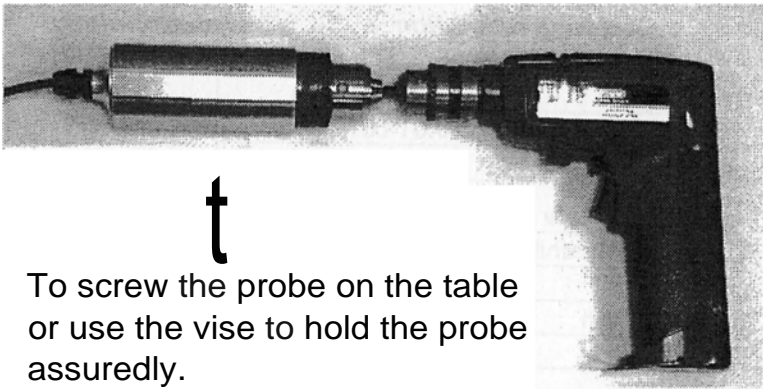

Fig. 2

To screw the probe on the table or use the vise to hold the probe assuredly.

Fig. 3

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8) Zero Button

Before the measurement, if the meter not show zero value, it can push the "Zero Button " (3-9, Fig. 1) to tare the display value, the LCD will change to zero value.

9) Apply the torque force, the LCD will show the measured torque value.

10) Peak hold

During the measurement, push the "Peak Button " (3-6, Fig. 1), the LCD will show the " PEAK " indicator & the display will hold the peak value.

Remark :

Under the peak hold function , the sampling time wJ1/ define to "Fast sampling "& the disiplay will show the "F "indicator.

11) Data Hold

During the measurement, pushing the " Hold Button " (3-3, Fig. 1) will freeze the measured value & display will indicate "HOLD " symbol. Push the "Hold Button " again to release the data hold function.

12) Data Record (Maximum, Minimum reading)

* The DATA RECORD function displays the maximum and minimum readings. To start the DATA RECORD function, press the " Max./Min. Button " (3-4, Fig. 1) once. " REC " symbol will appear on the LCD display.
* With the " REC " symbol on the display :
  (a) Push the " Max./Min. Button " (3-4, Fig. 1) once, the "Max "symbol along with the maximum value will appear on the display.

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(b) Push t he �"Max./Min . But ton "again, the " Min "
symbol along with the minimum value will appear
on the display.
(c) To exit the memory record function, push the
"Max./Min. "button continuously at least 2 seconds.
The display will revert to the current reading.

13) For quick measurement, follow the procedures
shown below :

Main procedures :

Connect the " Sensor Plu   " to the meter's " In ut Socket ".

Power on the meter & select the dis la unit.

Zero the meter b   ush the " Zero Button ".

Connect the torque sensor cramp to the   measuring
installation

Apply the torque force, meter will display the pressure value.

Optional measuring procedures :

DATA HOLD	MEMORY RECORD	RS232 OUTPU
	Max., Min.	

Power management :

AUTO POWER OFF | or | MANUAL POWER OFF
(Not activated during
Memory Record Selection)

5. AUTO POWER DISABLE

The instrument has built -in " Auto Power Shut-off " in
order to prolong battery life. The meter will switch off
automatically if none of the buttons are pressed within approx.
10 min.

To disable this feature, Select the memory
record function during measurement, by pressing
the " **Max./Min.** " button (3-4, Fig. 1).

6. RS232 PC SERIAL INTERFACE

The instrument features an RS232 output via 3.5 mm
Terminal (3-13, Fig. 1).

The connector output is a 16 digit data stream which
can be utilized to the user's specific applica tion.

**An RS232 lead with the following connection will
be required to link the instrument with the PC
serial input.**

Meter (3.5 mm jack plug)	PC (9W 'D" Connector)

Center Pin ....Pin 2
Ground/shield .... Pin 5

The 16 digit data stream will be displayed in the
following format :

D15 D14 D13 D12 D11 D10 D9 D8 D7 D6 D5 D4 D3 D2 D1 D0

Each digit indicate the following status :

$D0$	End Word
$D1$ & $D8$	Display reading, $D1$ = LSD, $D8$ = MSD For example : */f the display reading is 1234, then DB to 01 is : 00001234*
$D9$	Decimal Point(DP), position from right to the left 0 = No DP, 1= 1 DP, 2 = 2 DP, 3 = 3 DP
$D10$	Polarity 0 = Positive 1 = Negative
$D11$ & $D12$	Annunciator for Display Kq cm = 81 I LB inch = 82 I N cm = 83
$D13$	1
$D14$	4
$D15$	Start Word

RS232 **FORMAT :** 9600, **N, 8, 1**

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7. BATTERY REPLACEMENT

1) When the left corner of LCD display show "   ",
   It is necessary to replace the battery. However, within
   specification measurement may still be made for several
   hours after low battery indicator appears before the
   instrument become inaccurate.
2) Slide the Battery Cover (3-11, Fig. 1) away from the
   instrument and remove the battery.
3) Install a 9 V battery (heavy duty) and replace the cover.

8. OTHER OPTIONAL ACCESSORIES

RS-232 cable, Model : UPCB-01	RS-232 cable, used for connecting the torque meter & the computer.
Application Software (Window version) SW-U101-WIN	After setup whole hardware *Torque meter + RS -232 cable* *+ Computer + software* *(SW-U101-W/N)* whole system can execute as a data logger, data recorder.... record data can be retrieved for EXCELL, ACCESS, LOTUS-123 .....

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