CEM3-G

DATA TORK/
Digital Torque
Wrench

Direction

RoHS

| Inspection | Digital | Interchangeable | Direct Reading | Re-Chargeable | ISO6789:2003 |

• Dual LED & LCD displays for optimal viewing
• 999 memory storage capacity
• For inspection and tightening

CEM20N3×10D-G

CEM850N3×32D-G

CEM100N3×15D-G

TUD TOHNICHI UNIFIED DESIGN   CE

Common Specifications

Display	7 segments LED 4 lines 10mm (Torque value)
	14 segments LCD 3 lines 7mm (Counter)
	7 segments LCD 4 lines 3mm (Clock)
	Battery life indicator (4 steps)
	Judgment LED RED/BLUE
Number of Data Memory	999 (M-2 mode: 99 data)
Communication	RS232C (2400-19200bps)
Functions	Serial output corresponding to a USB connecter
Power Supply	Ni-MH rechargeable battery
Continuous Use	20 hrs with fully charged (8 hours by 1 hour recharging)
Recharging Time	3.5 hours
Operating Temperature	0-40 ℃
Basic Functions	Peak Hold, Auto memory & resetting, Tightening completion buzzer, Judgment of measured data, Auto zero setting, Auto off (3 minutes), Clock

Accuracy ±1%

Model	Torque Range										Hand Force [N]	Overall Length [mm]	Weight [kg]
	N·m		kgf·cm		kgf·m		lbf·in		lbf·ft				
	Min.-Max.	1digit	Min.-Max.	1digit	Min.-Max.	1digit	Min.-Max.	1digit	Min.-Max.	1digit			
CEM10N3×8D-G	2-10	0.01	20-100	0.1	0.200-1.000	0.001	20.0-90.0	0.1	1.50-7.30	0.01	48.1	212	0.46
CEM20N3×10D-G	4-20	0.02	40-200	0.2	0.400-2.000	0.002	36.0-180.0	0.2	3.00-14.50	0.02	92.2	214	0.47
CEM50N3×12D-G	10-50	0.05	100-500	0.5	1.000-5.000	0.005	100.0-440.0	0.5	7.50-36.00	0.05	196.9	282	0.58
CEM100N3×15D-G	20-100	0.1	200-1000	1	2.00-10.00	0.01	200-880	1	15.0-73.0	0.1	275.5	384	0.63
CEM200N3×19D-G	40-200	0.2	400-2000	2	4.00-20.00	0.02	360-1700	2	30.0-150.0	0.2	428.3	475	0.78
CEM360N3×22D-G	72-360	0.4	720-3600	4	7.2-36.00	0.04	650-3100	4	52.0-260.0	0.4	498.6	713	1.13
CEM500N3×22D-G	100-500	0.5	1000-5000	5	10.00-50.00	0.05	890-4400	5	73.0-360.0	0.5	549.5	949	4.00
CEM850N3×32D-G	170-850	1	-	-	17.0-85.0	0.1	-	-	124-620	1	608	1387	5.14

Note
1. Overall length does not include interchangeable head.
2. For interchangeable head, refer to page 45-48.
3. For infrared data transfer, use with R-DT999. Refer to page 70.
4. PH Pipe wrench head type interchangeable head is not available for this model.
5. CEM500N3×22D-G and CEM850N3×32D-G have knurled handles.
6. For USB data transfer, use optional connecting cable, No.584. Refer to page 50.

Standard Accessories
1. Battery pack/BP-5
2. QH interchangeable head. Refer to page 47.
3. Quick battery charger/BC-3-G (100-240V).

CEM3-P   RoHS

• Programmable version of CEM3-G with data management software that links work name with test results.

Torque Accuracy	±1%
Portion Registration Memory	Max. 100 parts (Part name, number of screws, tightening direction, high/low torque, measuring order)
Measurement Data Storage	Up to 3,000 screw data (vary depending on parts registered), measurement part name, measured value, pass/fail judgment, measurement time and date)

CEM50N3×12D-P

Display part
Left: Part name, Right: Torque value

CEM3-P application software

Model
CEM10N3×8D-P
CEM20N3×10D-P
CEM50N3×12D-P

Model
CEM100N3×15D-P
CEM200N3×19D-P
CEM360N3×22D-P

Model
CEM500N3×22D-P
CEM850N3×32D-P

Handy Terminal

Compact data collection device for CEM3-G
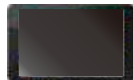
• Upload & download torque measuring information
• Guides user through torque assembly & quality inspection processes
• Statistics and charting capabilities
• Contact Tohnichi for lithium battery shipping specifications.

Battery Pack (P.50)

Model
BP-5

Quick Battery Charger (P.50)

Model	Description
BC-3-G	100V-240V

Printer (P.69)

Model
EPP16M3

Connecting Cable (P.50)

Part #	Applicable Model
575	CEM3-G, CEM3-P, R-DT999 - PC, EPP16M3
584	CEM3-G, CEM3-P, R-DT999G - PC

Data Filing System (P.69)

Model	Media
DFS	CD-ROM

Torque Wrench for Quality Inspection

CTB2-G
Digital Retightening Torque Wrench

Direction

RoHS

| Inspection | Digital | Interchangeable | Signal | Re-Chargeable | ISO6789:2003 |

• Detects movement of fastener for more accurate testing
• For quality inspection applications, confirms previously tightened torque values.

CTB100N2×15D-G

CTB850N2×32D-G

Accuracy ±1%

| Model | Torque Range | | | | | | | | | | Hand Force | Overall Length | Weight |
| | N·m | | kgf·cm | | kgf·m | | lbf·in | | lbf·ft | | | | |
	Min.-Max.	1digit	Min.-Max.	1digit	Min.-Max.	1digit	Min.-Max.	1digit	Min.-Max.	1digit	[N]	[mm]	[kg]
CTB10N2×8D-G	2-10	0.01	20-100	0.1	0.2-1	0.001	20-90	0.1	1.5-7.3	0.01	48.1	212	0.46
CTB20N2×10D-G	4-20	0.02	40-200	0.2	0.4-2	0.002	36-180	0.2	3-14.5	0.02	92.2	214	0.47
CTB50N2×12D-G	10-50	0.05	100-500	0.5	1-5	0.005	100-440	0.5	7.5-36	0.05	196.9	282	0.58
CTB100N2×15D-G	20-100	0.1	200-1000	1	2-10	0.01	200-880	1	15-73	0.1	275.5	384	0.63
CTB200N2×19D-G	40-200	0.2	400-2000	2	4-20	0.02	360-1700	2	30-150	0.2	428.3	475	0.78
CTB360N2×22D-G	72-360	0.4	720-3600	4	7.2-36	0.04	650-3100	4	52-260	0.4	498.6	713	1.13
CTB500N2×22D-G	100-500	0.5	1000-5000	5	10-50	0.5	890-4400	5	73-360	0.5	549.5	949	4.00
CTB850N2×32D-G	170-850	1	-	-	17-85	0.1	-	-	124-620	1	608	1387	5.14

Note
1. Overall length does not include interchangeable head.
2. For interchangeable head, refer to page 45-48.
3. For infrared data transfer, use with R-DT999. Refer to page 69.
4. PH type interchangeable head is not available for this model.

Standard Accessories
1. Battery pack/BP-5
2. QH interchangeable head (P.47).
3. Quick battery charger/BC-3-G, 100-240V

Common Specifications

Data Memory	999 data (T-point torque)
Arithmetic Function	Sampling, Maximum, Minimum, Means
Measurement Mode	Peak/Run
Data Output	RS232C I/F, USB serial output
Zero Adjustment	Auto zero function (C key)
Other Function	Auto power off (3 min./10 min./30 min./non)
Power Source	Ni-MH Nickel metal-hydride battery
Continuous Use	20 hours (8 hours by 1 hour charging)
Battery Charge	3.5 hours
Operating Temperature	0-40 °C

Battery Pack (P.50)

Model
BP-5

Quick Battery Charger (P.50)

Model	Description
BC-3-G	100-240V

Printer (P.69)

Model
EPP16M3

Connecting Cable (P.50)

Part #	Applicable Model
575	CTB2-G - PC, EPP16M3
584	CTB2-G, R-DT999G - PC

Data Filing System (P.69)

Model	Media
DFS	CD-ROM

Advantages of the New Retightening Method: T-point Method
• Anyone can measure the tightening torque easily.
• Requires less time to perform the measurement.
• Dispersion of data is small (Figure-3).
• No individual interpretation or performance variable is involved in measuring the torque (Figure-3).
• Internal software converts measured torque to initial tightening torque value (Figure-3).

Retightening Torque Method
Retightening torque method aims to measure the torque at which a tightened bolt start to rotate again as further torque is applied. The retightening measured values are classified as one of these three kinds:
• The torque which overcome the static friction of the bolt (A point).
• The torque at which the bolt starts on turn continuously (B point).
• The maximum torque at this inspection (C point).

Proposal of T-point method (Figure-2)
Retightening torque first starts with the rotation of the head only, then the screw starts to rotate. Shifting from static friction to dynamic friction, the friction whip settles and the torque starts to increase at the steady pace again. T-point method figures TT as retightening torque value.
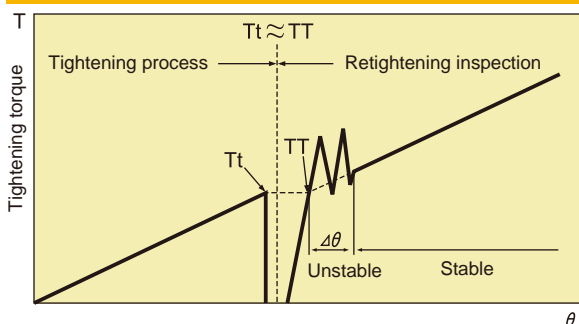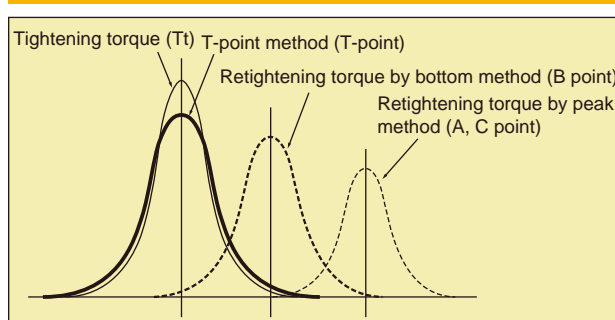
Figure-1 Traditional retightening torque method

Figure-2 New retightening torque method by CTB2-G

Figure-3 Distribution of retightening torque

Refer to Tohnichi Torque Handbook Vol. 9 on page 46 to 47 for the details.

Torque Wrench for Quality Inspection

CEM3-G-BTS
CEM3-G-BTD

Wireless Data Transfer
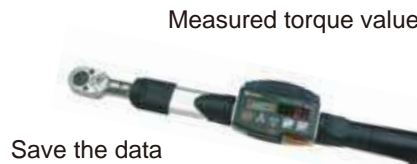Digital Torque Wrench

Direction

🔁 **RoHS**

CEM100N3×15D-G-BTS
CEM100N3×15D-G-BTD

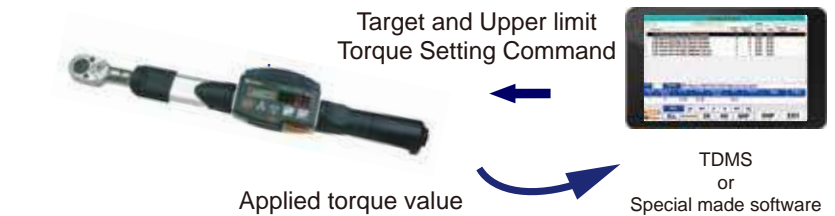** Bluetooth is a registered trademark of Bluetooth SIG, Inc.*

Tightening Data Management System

• Transfer collected data wirelessly by built in Bluetooth® module
• -BTS saves the data and transfers to an external device.
• -BTD receives tightening torque instructions from external device then transfers collected data back out.

Accuracy ±1%

Head Size	Model Simplex communication	Model Duplex communication	Torque Range N·m Min.-Max.	N·m 1digit	kgf·m Min.-Max.	kgf·m 1digit	lbf·ft Min.-Max.	lbf·ft 1digit	Overall Length [mm]	Weight [kg]
8D	CEM10N3×8D-G-BTS	CEM10N3×8D-G-BTD	2-10	0.01	0.200-1.000	0.001	1.50-7.30	0.01	212	0.54
10D	CEM20N3×10D-G-BTS	CEM20N3×10D-G-BTD	4-20	0.02	0.400-2.000	0.002	3.00-14.50	0.02	214	0.55
12D	CEM50N3×12D-G-BTS	CEM50N3×12D-G-BTD	10-50	0.05	1.000-5.000	0.005	7.50-36.00	0.05	282	0.66
15D	CEM100N3×15D-G-BTS	CEM100N3×15D-G-BTD	20-100	0.1	2.00-10.00	0.01	15.0-73.0	0.1	384	0.71
19D	CEM200N3×19D-G-BTS	CEM200N3×19D-G-BTD	40-200	0.2	4.00-20.00	0.02	30.0-150.0	0.2	475	0.86
22D	CEM360N3×22D-G-BTS	CEM360N3×22D-G-BTD	72-360	0.4	7.2-36.00	0.04	52.0-260.0	0.4	713	1.21
22D	CEM500N3×22D-G-BTS	CEM500N3×22D-G-BTD	100-500	0.5	10.00-50.00	0.05	73.0-360.0	0.5	949	4.08
32D	CEM850N3×32D-G-BTS	CEM850N3×32D-G-BTD	170-850	1	17.0-85.0	0.1	124-620	1	1387	5.22

Note
1. For the specification, standard accessories and note of the basic CEM3-G model, refer to page 39.
2. To use various functions, special software is required separately.
3. Contact Tohnichi for conditions of wireless certification acquisition for each country

CEM3-G-BTS

CEM3G-BTS Display

Torque Units
Time
Jugdment LED
Counter
Measured Torque Value

• Suitable for bolt inspection
• Transfer the realtime inspection record to PC/Tablet

Measured torque value

Save the data

TDMS
or
Special made software
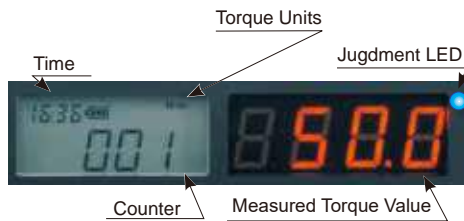
CEM3-G-BTD

CEM3G-BTD Display

Torque Unit
Upper Torque Limit
Jugdment LED
Target Torque
Applied Torque Value

• Suitable for bolt tightening operation
• Change the preset target and upper limit torque by Bluetooth command input
• Preliminary alert at 80 % of the target torque
• Transfer realtime tightening data to PC/Tablet
  (Data will not be saved in the wrench memory)

Target and Upper limit Torque Setting Command

TDMS
or
Special made software

Applied torque value

CEM3-G-WF

Wireless LAN communication
data transfer digital torque wrench

Direction

🔁

CEM100N3×15D-G-WF

• 2.4/5GHz wireless LAN communication version of CEM3-G
• Conforming to the IEEE 802.11 wirelsss communication for LAN networok
• Includes both simple and duplex functionality for tightening and inspection

Accuracy ±1%

Head Size	Model Duplex communication	Torque Range N·m Min.-Max.	N·m 1digit	kgf·m Min.-Max.	kgf·m 1digit	lbf·ft Min.-Max.	lbf·ft 1digit	Overall Length [mm]	Weight [kg]
8D	CEM10N3×8D-G-WF	2-10	0.01	0.200-1.000	0.001	1.50-7.30	0.01	212	0.54
10D	CEM20N3×10D-G-WF	4-20	0.02	0.400-2.000	0.002	3.00-14.50	0.02	214	0.55
12D	CEM50N3×12D-G-WF	10-50	0.05	1.000-5.000	0.005	7.50-36.00	0.05	282	0.66
15D	CEM100N3×15D-G-WF	20-100	0.1	2.00-10.00	0.01	15.0-73.0	0.1	384	0.71
19D	CEM200N3×19D-G-WF	40-200	0.2	4.00-20.00	0.02	30.0-150.0	0.2	475	0.86
22D	CEM360N3×22D-G-WF	72-360	0.4	7.2-36.00	0.04	52.0-260.0	0.4	713	1.21
22D	CEM500N3×22D-G-WF	100-500	0.5	10.00-50.00	0.05	73.0-360.0	0.5	949	4.08
32D	CEM850N3×32D-G-WF	170-850	1	17.0-85.0	0.1	124-620	1	1387	5.22

Note
1. For the specification, standard accessories and note of the basic CEM3-G model, refer to page 39.
2. To use various functions, special software is required separately.
3. Contact Tohnichi for status of wireless certification acquisition for each country

CEM3-G-WF Wireless LAN transmitter Specifications

Wireless Standard	IEEE 802. 11a/b/g/n	Authentication Method	WPA2
Frequency	11b/g/n: 2.4/5GHz 11b/g : 2.4/ 11n/a : 5GHz	Transmission Speed	11b: Max.11Mbps 11a/g: Max. 54Mbps 11n: Max. 72.2Mbps
Modulation Method	11b: DSSS, 11a/g/n: OFDM	Communication Distance	Approx. 50m* *Veris in radio conditions
Protocol	TCP/IPv4		
Display	Power LED, Status LED	Acquisition of License	TELEC, FCC, IC. SRRC

Torque Wrench for Assembly

CEM3-G-BTA

Wireless Data Transfer Digital Torque Wrench with Angle

Direction

RoHS

CEM100N3×15D-G-BTA

Bluetooth is a registered trademark of Bluetooth SIG, Inc.

Tightening Data Management System

- Transfer collected data wirelessly by built in Bluetooth® module
- Angle monitoring at the peak tightening torque or measured torque value
- Wireless duplex communication sends the Hi/Lo limit torque and angle settings to the wrench then sends the collected data back out to PC

Accuracy ±1%

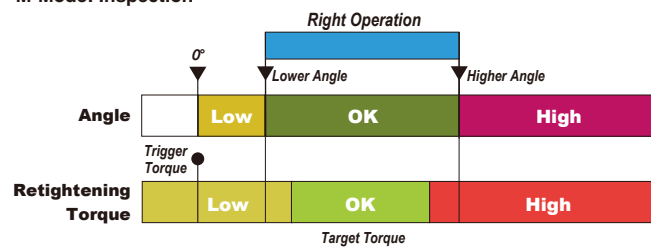| Head Size	Model	Torque Range						Overall Length [mm]	Angle Range		Angle Accuracy	Weight [kg]
		N·m		kgf·m		lbf·ft						
		Min.-Max.	1digit	Min.-Max.	1digit	Min.-Max.	1digit		Min.-Max.	1digit		
8D	CEM10N3×8D-G-BTA	2-10	0.01	0.200-1.000	0.001	1.50-7.30	0.01	212			±2°+1digit (Angular velocity is 30°/ X~180°/s when the bolt turned to 90°)	0.54
10D	CEM20N3×10D-G-BTA	4-20	0.02	0.400-2.000	0.002	3.00-14.50	0.02	214				0.55
12D	CEM50N3×12D-G-BTA	10-50	0.05	1.000-5.000	0.005	7.50-36.00	0.05	282				0.66
15D	CEM100N3×15D-G-BTA	20-100	0.1	2.00-10.00	0.01	15.0-73.0	0.1	384	0-999°	1°		0.71
19D	CEM200N3×19D-G-BTA	40-200	0.2	4.00-20.00	0.02	30.0-150.0	0.2	475				0.86
22D	CEM360N3×22D-G-BTA	72-360	0.4	7.2-36.00	0.04	52.0-260.0	0.4	713				1.21
22D	CEM500N3×22D-G-BTA	100-500	0.5	10.00-50.00	0.05	73.0-360.0	0.5	949				4.08
32D	CEM850N3×32D-G-BTA	170-850	1	17.0-85.0	0.1	124-620	1	1387				5.22

Note
1. For the specification, standard accessories and note of the basic CEM3-G model, refer to page 39.
2. Trigger torque can be set from the 5% of the maximum torque to the maximum.
3. Trigger torque set below the minimum torque range of the body is not guaranteed.

By monitoring the final torque and the final angle, reliability for tightening and inspection data can be confirmed

For Inspection

Monitoring excessive or extremely small angle rotation during the re-tightening inspection will provide evidence for correct data verification.

M-Mode: Inspection

Right Operation

0°

Lower Angle · Higher Angle

Angle | Low | OK | High

Trigger Torque

Retightening Torque | Low | OK | High

Target Torque

Possible causes of angle monitoring results

Angle Low
- *Possibility of the operation errors*
- *Stopped loading before the bolt moving*

Angle High
- *Possibility of the operation errors*
- *Rotated too much on the retightening inspection process*

Right Operation
*Torque OK, Angle OK*
Torque NG, Angle OK

Error Operation
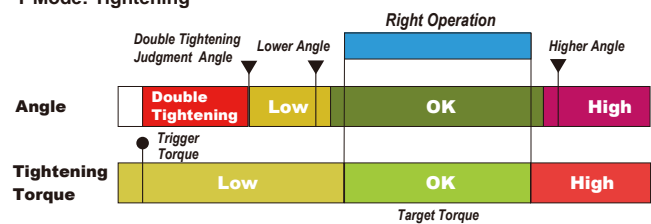*Torque OK / NG*
Angle NG

For Tightening

By detecting final angle at the completion of the tightening operation, it is possible to eliminate tightening errors caused by provisional tightening, the tightening application or double tightening.
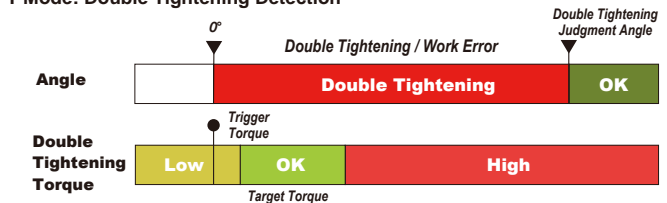
Judgment Result Display

Counter

Judgment LED

Torque/Angle Judgment Symbol

Judgment

Torque Value
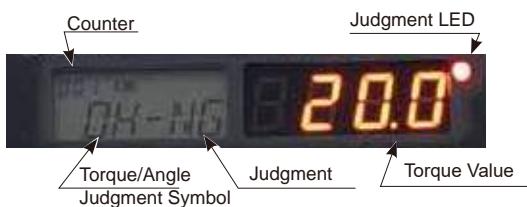
L :Less than the lower limit (Low-NG)
O :OK
H :Beyond the upper limit (High-NG)
D :Double tightening (NG tightening)

T-Mode: Tightening

Right Operation

Double Tightening Judgment Angle | Lower Angle | Higher Angle

Angle | Double Tightening | Low | OK | High

Trigger Torque

Tightening Torque | Low | OK | High

Target Torque

T-Mode: Double Tightening Detection

0°

Double Tightening Judgment Angle

Double Tightening / Work Error

Angle | Double Tightening | OK

Trigger Torque

Double Tightening Torque | Low | OK | High

Target Torque

Possible causes of angle monitoring results

Angle Low
- *Double Tightening*
- *Cross Threaded Screw*
- *Defect fo work/Bolt*
- *Contamination*

Angle High
- *Defect of Work/Bolt*
- *Lack of O-Ring/Gasket*
- *Over torque of the provisional tightening*

Right Operation
Torque OK
Angle OK

Error Operation
Torque OK / NG
Angle NG