

BTM/ B-BTM

Bolt Tension Meter

Dial Indicating **Hydraulic** **Bourdon Type**

- Bourdon type hydraulic bolt tension meter
- Measure bolt tension to determine optimal torque

Accuracy ±3%



BTM400K



B-BTM13K

S.I. Model	Axial Tension Range [kN]		Metric Model	Axial Tension Range [ton]		American Model	Axial Tension Range [lbf]		Applicable Nominal Diameter of Bolts (Minimum Length) [mm]	Dimensions			Weight [kg]
	Min.-Max.	Grad.		Min.-Max.	Grad.		Min.-Max.	Grad.		Overall Length [mm]	Overall Thickness [mm]	Overall Height [mm]	
BTM400K	100-400	5	40BTM-2	10-40	0.5	40BTM-2-A	23000-90000	1000	Hexagon Bolt M16 (70), M20 (75) M22 (80), M24 (85) Torsia Bolt M16 (65), M20 (70) M22 (75), M24 (80)	260	64	280	12.6
B-BTM13K	1.2-13	0.2	1.3B-BTM	0.12-1.3	0.02	1.3B-BTM-A	300-2800	50	Standard Bolt M5 (20), M6 (21) M7 (22), M8 (23)	106	78	217	7.7
B-BTM40K	4-40	0.5	4B-BTM	0.4-4	0.05	4B-BTM-A	1000-9000	100	Standard Bolt M10 (29), M12 (31) M14 (32)	134	82	241	9.8
B-BTM130K	12-130	2	13B-BTM	1.2-13	0.2	13B-BTM-A	3000-28000	500	Standard Bolt M16 (41), M18 (43) M20 (44), M24 (47)	186	106	287	17.5
B-BTM400K	40-400	5	40B-BTM	4-40	0.5	40B-BTM-A	1000-90000	1000	Standard Bolt M27 (72), M30 (74) M36 (79), M42 (84)	280	126	369	31.0

Note
 1. BTM400K comes with a plate and bushing for torsia bolt M20 and M22. Other plates and bushings are optional.
 2. "Hexagon Bolt" in the above list stands for the high-tensile hexagon bolt for friction bonding.

Standard Accessories Plate, Bushing, Spanner for plate, Bolt for plate, Storage Case, Calibration Certificate

BTM Optional Accessories

Busing for Hexagon Bolt

Part #	Applicable Nominal Diameter of Bolts
650	M16
651	M20
652	M22
653	M24

Bushing for Torsia Bolt

Part #	Applicable Nominal Diameter of Bolts
665	M16
666	M20
667	M22
668	M24

Plate for Torsia Bolt/Hexagon Bolt

Part #	Applicable Nominal Diameter of Bolts
669	M16
670	M20
671	M22
672	M24

Fcon Bolt Tension Stabilization

RoHS

- Creates consistent bolt tension
- Applied to fasteners and nuts

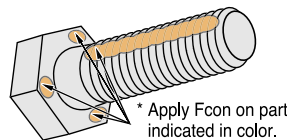


Fcon

Model
Fcon

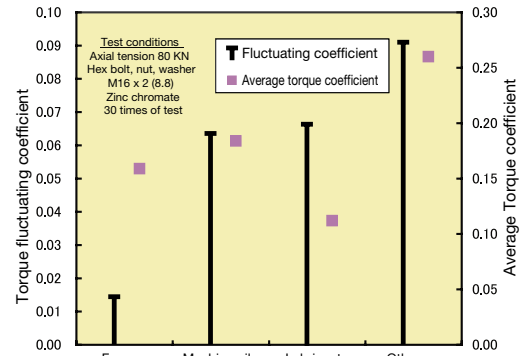
Sales Unit: 10pcs/case
 Content: 90g/bottle

How to apply Fcon on the bolt (in case of M10 bolt)
 Follow the illustration below. Apply some along the screw thread (2 mm width more or less), and on the bearing surface at 3 different spots evenly. Use appropriate amount depending on the size of the bolt.



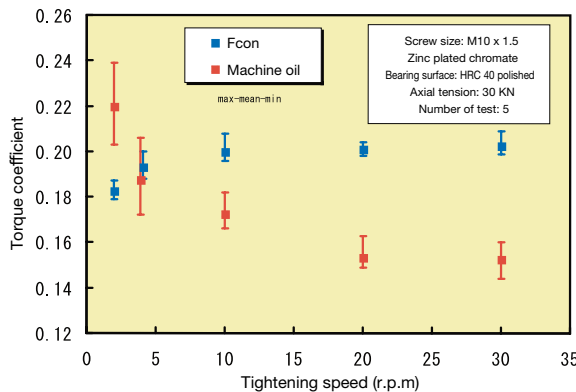
* Apply Fcon on part indicated in color.

Axial Tension Stability Characteristics



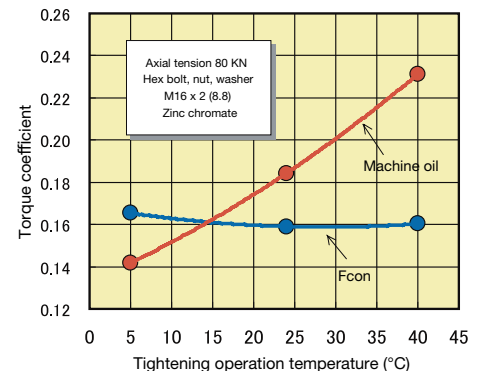
Characteristic of axial tension stabilization
 Torque coefficient calculated by formula $K = T/(d \times f)$
 T = tightening torque, d = nominal size of screw, F = axial tension
 Torque fluctuating coefficient = torque coefficient standard deviation/average torque coefficient

Influence of Tightening Speed



Influence of tightening speed on torque coefficient

Influence of Temperature



Influence of temperature on torque coefficient



TT2000 Ultrasonic Tension Meter



TT2000

Digital **Direct Reading**

- Non-destructive axial bolt tension tester
- Input information regarding fastener & materials
- Sound wave lengths are measured and compared.

Model
TT2000
TT2000C
TT2000M

TT2000 Specifications

Measuring Range	5-10,000mm (Steel material)
Applicable Length of Bolt	50-9,000mm
Applicable Nominal Diameter of Bolt	φ6mm dia or more (Applicable for less than φ6mm dia. with an optional sensor)
Ultrasonic Wave Frequency	0.5-15 MHz
Time Axis Resolution	5ns
Result of Measurement	Bolt initial length (mm), Stress (Mpa), Elongation (mm), Propagation rate (μs)
Measuring Resolution	Depends on bolt diameter and length [Ex.] Based on the first echo measurement (steel material) Bolt diameter φ10, Bolt tightening length 50mm ±approx. 1.47kN Bolt diameter φ20, Bolt tightening length 100mm ± approx. 2.94kN
Memory Capacity of Data	2,000pcs. or time pass measurement 300 items (Max. 50 kinds of different bolts can be registered)
Bolt Temperature Correction	Manual input by key, Auto temperature input *1
Display	Color TFT6.4 type (640 × 480dots)
External Output	8 bits serial interface (RS232C) *2 Composite output (NTSC), Alarm output (photo coupler), Encoder input *3
Power Supply	AC85-130V, AC185-265V (50/60Hz) or DC12V *4
Optional Battery	Portable: 2.5h use for 1.5h Charge Built-in case: 8h use for 4.5h charge
Temperature of Use	0-45 Celsius
Dimensions	Body: H160 × W246 × D60mm Body + Built-in battery: H160 × W246 × D246mm
Weight	Body: 1.2kg Body + built-in battery: 4.9kg

Note

1. Optional thermometer can be connected to TT2000C and TT2000M for auto temperature adjustment Input temperature range is from -40°C to 200°C. Measurement over 60°C requires a sensor specially designed for high temperature.
2. RS232C connector is available only with TT2000C and TT2000M.
3. Composite output, alarm output and encoder input are available only when using a multi connector box (TT2000M) or optional built-in battery case.
4. DC12V can be used only when using the optional portable battery or the built-in battery case.



Axial Tension Calibrator

Model
AFC-20G

TT2000 Optional Accessories

Model Name
RS232C Junction Cable A
Portable Battery Cable
RS232C Junction Cable B
Battery Built-in Body
Handy Type Cover
Portable Type Cover
TT2000 Carrying Case
Portable Battery Pack
Light Shielding Hood
Carrying Case for Body with Battery Built-in Body

Ultrasonic Sensor

Part #	Name	Applicable Bolts
606	5C4.8N	More than M6, L1<approx.80mm
607	5C6.4N	More than M8, L1<approx.50cm
608	5C12.7N	More than M14, L1<approx.2m
609	5C19.1N	More than M20, L1<approx.4m

Note

1. L1 is standard bolt length with material in SCM, S-C, SS for ultrasonic wave reflection measurement n=1.
2. Ultrasonic wave sensor is consisting of 3 parts, Sensor, Magnet Holder and Bolt Holder.
3. Standard 5C6. 4N does not include bolt holder.
4. 5C6.4N=[5: Frequency (MHZ)]
[C: Oscillator Material (C: piezoelectric ceramics)]
[6.4: Oscillator Diameter, mm]
[N: Perpendicular (Normal)]

Features of ultrasonic wave sensor

1. The magnetic holder provides stabilized force through the sensor, which provides high repeatability measurement.
2. The bolt holder gives same position of the sensor to support more accurate measurement.

FP

Force Pen



CD42

Display (Sold separately)

Voltage Output Pen

- Pen style force sensor
- Compact, lightweight, user friendly operation
- Requires CD42 Compact Display

Model	Measurement Range	Rated Output	Accuracy	Allowable Overload	Display (Option)	Weight [g]
	[N]					
FP1	±0.1-1	1mV/V	±1% F.S.	150%	CD42	80
FP2	±0.2-2					
FP4	±0.4-4					
FP10	±1-10					
FP20	±2-20					
FP40	±4-40					

Note 1. CD42 (Display) is optional.
2. FP models are supplied upon request.

Standard Accessories Standard Attachment

FG

Force Grip



FG100



CD42

Display (Sold separately)

Voltage Output Grip

- Grip style force sensor
- For large product testing
- Requires CD42 Compact Display

Model	Measurement Range	Rated Output	Accuracy	Allowable Overload	Display (Option)	Weight [g]
	[N]					
FG40	±4-40	2mV/V	±1% F.S.	150%	CD42	580
FG100	±10-100					
FG200	±20-200					
FG400	±40-400					

Note 1. CD42 (Display) is optional.
2. FG models are supplied upon request.

Standard Accessories Standard Attachment

