



Hand Held Type Digital Tension Meter  
High Function Type (with output)

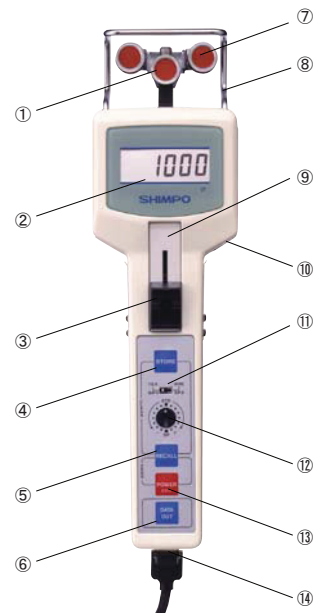
## DTMX- □ C Series

General Purpose Type (without Output)

## DTMB- □ C Series

### Corresponds to High Level Measurement Environment

- |  |   |
|--|---|
| (1) SENSING ROLLER   | (8) WIRE GUIDE  |
| (2) LCD DISPLAY EQUIPMENT<br>Maximum. Minimum Value, PEAK Value,<br>Lights up whenever all indications battery<br>low.   | (9) DIP SWITCH COVER (DIP SWITCH)<br>Memory Mode, Display Time,<br>Data Output, Wire Type Set.                  |
| (3) SLIDE-KNOB FOR GUIDE ROLLER<br>Use when the measuring wire is<br>pinched. (In place of Slido-knob for<br>guide roller, supporting lever can be<br>installed. | (10) CONNECTOR FOR AC ADAPTER<br>Connect the optional adapter.  |
| (4) STORE SWITCH<br>Use at data memory.  | (11) WIRE TYPE SWITCHING SWITCH<br>Matching with the Wire Type, Select<br>TEX (Thread), or WIRE (Steal,Copper). |
| (5) RECALL SWITCH<br>Used when Maximum. Minimum Value<br>Memory Data is to be recalled.  | (12) FIELD ADJUSTMENT SWITCH<br>When indication value is increased<br>it executes correction.                   |
| (6) MEMORY DATA OUTPUT SWITCH<br>Data Output - when PC or Printer<br>is connected.   | (13) POWER SUPPLY SWITCH<br>Performs power supply ON/OFF.   |
| (7) GUIDE ROLLER   | (14) CONNECTOR FOR OUTPUT   |



Width 76 x Thick 48 x Length 275mm  
The photograph is of DTMX- □ C Series

\* Note : 1cN=1.0197 gf=0.01N  
1daN=10N1.02kgf(1kgf9.8N=0.98daN)

Model	Maximum Load	
	Force	Weight
DTMX-0.2C	196.1cN	200.0g
DTMB-0.2C		
DTMX-0.5C	490.3cN	500.0g
DTMB-0.5C		
DTMX-1C	981cN	1000g
DTMB-1C		
DTMX-2C	1961cN	2000g
DTMB-2C		
DTMX-2.5C	2452cN	2500g
DTMB-2.5C		
DTMX-5C	4903cN	5000g
DTMB-5C		
DTMX-10C	9.81daN	10.00kg
DTMB-10C		
DTMX-20C	19.61daN	20.00kg
DTMB-20C		

**Measurement Items :** Optical Fiber, Carbon Fiber, Magnetic Tape, Food Stuffs Film, Steal Wire etc.

**Wire Speed (Max.) :** 1000m/min.

Corresponding with recording or statistical process, high level measurement environment hand belt model controlled through the PC control – the Digital Tension Meter.

- Through RS-232C, digimatic output, analog output, controlling is possible for PC printer measurement values. (DTMX- □ C Series)
- Up to 100 items measured data could be memorized. Further, proper printer connection, Max. Min. Value. Average Values etc. – automatic statistical processing is possible.
- At 1 machine, max. 5 types of wire varieties could be measured. (Thread steal wire and copper wire. Other than this, 2 types sample wires)
- Realization of ± 1% R.C. High Accuracy. (DTMX-0.2C, 0.5C/DTMB-0.2C, 0.5C)
- Application of strong aluminum case against shock or static electricity.

Calibration as per customer's specified special wire calibration could also be coped-up.

Hand held Model  
– for Low Tension Measurement.  
Analog Tension Meter

## ZF2 Series



Low Tension Measurements made possible on Analog Tension Meter.

- Series of 6 types for Max. 1 ~ 5 cN ultra low tension to 100 cN.
- Pressing the trigger, easy measurement by pinching between the measurement wire measuring roller and guide roller.
- Operatically considered slim measuring (230g) and compact design.

Width 125 x Height 155 x Thickness 30mm

Model	Maximum Load	
ZF2-5	1 ~ 5cN	1.020 ~ 5.099g
ZF2-10	1 ~ 10cN	1.020 ~ 10.20g
ZF2-20	2 ~ 20cN	2.039 ~ 20.39g
ZF2-30	3 ~ 30cN	3.059 ~ 30.59g
ZF2-50	5 ~ 50cN	5.099 ~ 50.99g
ZF2-100	10 ~ 100cN	10.20 ~ 102.0g

**Roller Span :** 22mm

**Accuracy :** ± 1%/R.C. or ± 1 Scale

\*For 20K, 50K, 100K please enquire.

For details refer to pages 17 ~ 18

■ DTMX- □ C Series/DTMB- □ C Series

Model	High Function Model (with Output)	DTMX-0.2C	DTMX-0.5C	DTMX-1C	DTMX-2C	DTMX-2.5C	DTMX-5C	DTMX-10C	DTMX-20C
	Common Use Model (without Output)	DTMB-0.2C	DTMB-0.5C	DTMB-1C	DTMB-2C	DTMB-2.5C	DTMB-5C	DTMB-10C	DTMB-20C
Rated Capacity (R.C.) <sup>Note1</sup>		196.1cN(200.0g)	490.3cN(500.0g)	981cN(1000g)	1961cN(2000g)	2452cN(2500g)	4903cN(5000g)	9.81daN(10.00kg)	19.61daN(20.00kg)
Display Possible Scope		0.0 ~ 200.0cN	4.0 ~ 500.0cN	100 ~ 1000cN	200 ~ 2000cN	250 ~ 2500cN	500 ~ 5000cN	1.00 ~ 10.00daN	2.00 ~ 20.00daN
Measurement Wire	Thread	<1000 Denier or <0.015	φ 0.05 ~ φ 0.25	φ 0.1 ~ φ 0.4	φ 0.3 ~ φ 0.7	φ 0.3 ~ φ 0.7	φ 0.5 ~ φ 1.2	φ 0.7 ~ φ 1.4	As per sample Customer's special calibration will be performed.
	Steel Wire	Less than φ 0.08	φ 0.01 ~ φ 0.15	φ 0.05 ~ φ 0.25	φ 0.15 ~ φ 0.4	φ 0.15 ~ φ 0.4	φ 0.3 ~ φ 0.7	φ 0.4 ~ φ 0.8	
	Copper Wire	Less than φ 0.15	φ 0.05 ~ φ 0.25	φ 0.1 ~ φ 0.4	φ 0.3 ~ φ 0.6	φ 0.3 ~ φ 0.6	φ 0.4 ~ φ 1.0	φ 0.7 ~ φ 1.2	
Roller Span		38mm				100mm			150mm·200mm
Roller		Ø12 Hard Coat Aluminum							
Accuracy (when Wire is static)		± 1% R.C.				± 1.5% R.C.			
Measurement Period		0.5, 1, 2, 4 Switching Over Type							
Memory	DTMX- □ C	Final Measurement Value, Max. Value, Min. Value, PEAK Value, Measurement Data 100 items, (Memory Back-up through Battery), Statistical Data <sup>Note5</sup>							
	DTMB- □ C	Final Measurement Value, Max. Value, Min. Value, PEAK Value							
Maximum Speed <sup>Note4</sup>		1000m/min							
Field Adjustment		Max. ± 10.5% of reading, per 1 notch ± 1.5%							
Display Equipment		4 Digit LCD. Letter Height 11.5mm							
Output Signal	Analog Output	0 ~ 1 VDC(Towards Display Possible Scope), (D/A Output Transmission Time about 16msec, Resolution capacity 3000), Load Resistance more than 2kΩ							
	DTMX- □ C Digital Output	RS-232C or Digimatic (Selectable)							
Working Temperature/Working Humidity		0 ~ 45°C / Below 90% R.H.							
Current		AA Size Dry Cell x 4 Nos. (with Alkali Battery, continuous running of about 20 hours) or A.C. Adapter (Optional)							
Dimensions	Outer Shape	Width 76 × Thickness 48 × Length 257mm							
	Wire Guide	Width 65mm							
Weight		About 650g				About 700g			
Accessories		AA Alkali Dry Battery 4 Nos., Carrying Case							
Utility Examples (Excluding Standard Measurement Wire)		Flexible Thread Less than Ø0.15 Metal Thread, Silver Thread Coated format, Optical Fiber Synthetic Fiber Winder	Optical Fiber Opt. Fiber gathering M/c. Carbon Fiber Copper Winder Steel Wire gathering M/c	Aramid Fiber Film for condenser Food stuffs film Up to Ø0.3 Brass Wire Copper Winder Magnetic Tape	Carbon Fiber Steel wire up to Ø0.1 Copper Foil for Electrical wire. (width 20 x 0.1) Tire Code	Specialty, bending angle small things, material demand. Steel Wire for OA. (Copy machine, printer for OA)	Carbon Fiber Measuring Tape (10mm Wide × 0.05t)	Tungsten Wire up to Ø 0.8 Flat or Timing Belt up to width 15mm	Customer's Sample Wire.

■ ZF2 Series

Model	ZF2-5	ZF2-10	ZF2-20	ZF2-30	ZF2-50	ZF2-100
Rated Capacity (R.C.)	1 ~ 5cN (1.020 ~ 5.099g)	1 ~ 10cN (1.020 ~ 10.20g)	2 ~ 20cN (2.039 ~ 20.39g)	3 ~ 30cN (3.059 ~ 30.59g)	5 ~ 50cN (5.099 ~ 50.99g)	10 ~ 100cN (10.20 ~ 102.0g)
Measurement Wire	Thread : Less than φ 0.15mm					
Roller Span	22mm					
Roller	Hard Coat Aluminum					
Accuracy	± 1% R.C./R.C. or ± 1 Scale					
Speed <sup>Note2</sup>	MAX.900m/min					
Working Temperature	8 ~ 45°C					
Working Humidity	85%以下					
Case Material	Delrin					
Outer Dimensions	Width 125 × Thickness 30 × Length 155mm					
Weight	About 230kg					
Accessories	Carrying Case					

\* Roller Wearing or measuring wire effect (winding etc.), no guarantee for accuracy.

Note 1 : R.C. = Rated Capacity

Note 2 : Our Company Standard Wire Calibration is as under :

Thread : For Hanging - Nylon Thread.

Steel Wire : SUS304(Hardness Hv531 ~ 541)

Copper Wire : Tinning Soft Copper Wire (Hardness Hv69 ~ 82)

Further if the measurement items apt to vibrate, or if they are like rubber inflection etc., then there would be no accuracy guarantee and hence inquire beforehand. Further, for out of specification items, measurement error may arise and hence take caution.

Note 3 : Depending upon the wire material, it may not cope-up and hence please inquire

Note 4 : For Roller Wearing or measuring wire effect (winding etc.), no guarantee for accuracy

Note 5 : Statistic Data

Sample Frequency(DATA) : in

Maximum Value(MAX) : Xmax

Minimum Value(MIN) : Xmin

Average Value(AVG) :  $\sum Xi/n = \bar{x}$

Standard Deviation(DEV) :  $\sqrt{\sum (Xi-\bar{x})/n}$

■ PLS- □ G Series

Model	PLS-10G	PLS-20G	PLS-50G
Rated Capacity (R.C.)	9.81cN (10g)	19.61cN (20g)	49.03cN (50g)
Measurement Item (Measurement Wire)	Metal Wire of Less Than Ø0.06mm <sup>Note1</sup>		
Allowable Over Load	± 200% /R.C. ± 2% /R.O. <sup>Note2</sup>		
Wire Speed (Max.) <sup>Note3</sup>	500m/min		
Roller Shape	φ 15mm "V" Groove Ceramic Roller		
Environment Endurance	Liberation Model (Sensor Parts, Bearing Parts) <sup>Note 4</sup>		
Working Temperature	10 ~ 40°C		
Connected Cables	φ 3mm Sealed Cable Length 3mIndicator		
Indicator	CSD-819 Attached. (with Analogue, comparator output)		
Dimensions	Width 67 × Thickness 33 × Length 101mm		
Weight	About 150kg.		

Note 1 : Measurement is possible for Textile Fiber, Metal Wire about Ø0.06mm. However, the test results depend on the sample supplied.

Note 2 : The Value is for Static Condition : (wire speed 0, wire not moving)

Note 3 : \* Roller Wearing or measuring wire effect (winding etc.), no guarantee for accuracy.

Note 4 : This is not the Preserving Structure as against Very small particles, liquid etc.

■ PLS- □ K- □ - □ B Series

Model	PLS-0.2K-	PLS-0.5K-	PLS-1K-	PLS-2K-	PLS-5K-	PLS-10K-
Rated Capacity (R.C.)	1.961N (0.2kg)	4.903N (0.5kg)	9.807N (1kg)	19.61N (2kg)	49.03N (5kg)	98.07N (10kg)
Measurement Items <sup>Note1</sup>	Thread	φ < 0.15	φ < 0.25	φ < 0.4	φ < 0.7	φ < 1.2
	Steel Wire	φ < 0.08	φ < 0.15	φ < 0.25	φ < 0.4	φ < 0.7
	Copper Wire	φ < 0.15	φ < 0.25	φ < 0.4	φ < 0.6	φ < 1.0
Wire Speed (MAX) <sup>Note 2</sup>	1000m/min					
Detection Roller Displacement	Max. 0.3mm/ at Rated Pulling Power					
Roller Shape	φ 12mm "V" Groove Roller				φ 22mm "V" Groove Roller	
Roller Span	50mm				100mm	
Allowable Over Load	± 200% /R.C.					
Measurement Accuracy (when measurement wire is static) <sup>Note 3</sup>	± 1% /R.O.					
Rated Output <sup>Note 4</sup>	DC10V					
Input Current	DC12V(10.5 ~ 15.5V)0.15A, as per specification DC-5V, DC-24V is possible					
Cable Length	2m					
Weight	About 630g				1kg	
Preservative Structure	IP52					

■ PLS- □ K- □ - □ C Series

Model	PLS-0.2K-	PLS-0.5K-	PLS-1K-	PLS-2K-	PLS-5K-	PLS-10K-
Rated Capacity (R.C.)	1.961N (0.2kg)	4.903N (0.5kg)	9.807N (1kgf)	19.61N (2kg)	49.03N (5kg)	98.07N (10kg)
Measurement Item	< 10, 15, 20, 30mm, Thickness < 0.2mm					
Wire Speed (MAX) <sup>Note 2</sup>	300m/min <sup>Note 1</sup>					
Detection Roller Displacement	Max. 0.3mm/ at Rated Pulling Power					
Roller Shape	φ 13mm Cylindrical Roller width 10,15,20,30mm				φ 20mm Cyl. Roller	
Roller Span	50mm				100mm	
Allowable Over Load	± 200% /R.C.					
Measurement Accuracy (when measurement wire is static) <sup>Note 3</sup>	± 1% /R.O.					
Rated Output <sup>Note 4</sup>	DC10V					
Input Current	DC12V(10.5 ~ 15.5V)0.15A, as per specification DC-5V, DC-24V is possible					
Cable Length	2m					
Weight	About 630g				1kg	
Preservative Structure	IP52					

Note 1 : Our company standard wire calibration is as follows :

Thread : For Hanging - Nylon Thread. Steel Wire : SUS304(Hardness Hv531 ~ 541) Copper Wire : Tinning Soft Copper Wire (Hardness Hv69 ~ 82)

Note 2 : For Roller Wearing or measuring wire effect (winding etc.), no guarantee for accuracy

Note 3 : Depending upon material quality sometimes, accuracy guarantee cannot be given so please inquire.

Note 4 : Depending upon material quality, there may be some variations.

■ Indicator CSD-819C

Model	CSD-819C		
Detector Corresponding Model	PLS-10G	PLS-20G	PLS-50G
Non-Straight Line	within 0.196/FS		
Analog Film	100Hz <sup>Note</sup> (Switch Over possible for 10, 100, 1000Hz)		
A/D Sampling	2000 Rev./Sec. <sup>Note</sup>		
Display Scope	0.00 ~ 10.00cN	0.00 ~ 20.00cN	0.00 ~ 50.00cN
Indicator Resolution Capacity	0.10cN	0.20cN	0.50cN
Display Equip. Frequency	(0.01, 0.02, 0.05, 0.10, 0.20, 0.50 Selectable)		
Display Equipment	20Rev./Sec. (Switch Over possible at 4,20,50,100R/S)		
Mode Display	Red Color 7 Segment LED Letter Height 17.0mm		
Decision Display	PEAK, BOTTOM, ZONE (LED Display)		
Measurement Mode	S0, S1, S2, S3, S4		
Measurement Mode	Track, Peak Hold, Bottom Hold, Peak Bottom Hold, Segment Peak Hold, Segment Bottom Hold		
Analog Output	DC 10V(At Rated Pulling Power)		
Comparator	Setting at 5 Points, Open Corrector Output		
Outer Parts Control	ZERO, PEAK/TRACK, HOLD etc.		
Working Temp & Humidity Scope	0 ~ 50c, <85%RH(However, condensation not allowed)		
Current	AC100V ~ 240V 50/60Hz, About 15VA (Permissible Scope AC-85 ~ 264V)		
Outer Dimensions	Width 96 x Height 96 x Depth 129.5mm		
Weight	About 600 kg		

Settings at Shipping. If disturbed, it may affect the Noise, Response etc.

- R.C. = RATED CAPACITY
- 1cN = 1.0197g = 0.01N
- 1daN = 10N ≒ 1.02kg (1kg ≒ 9.8N = 0.98daN)