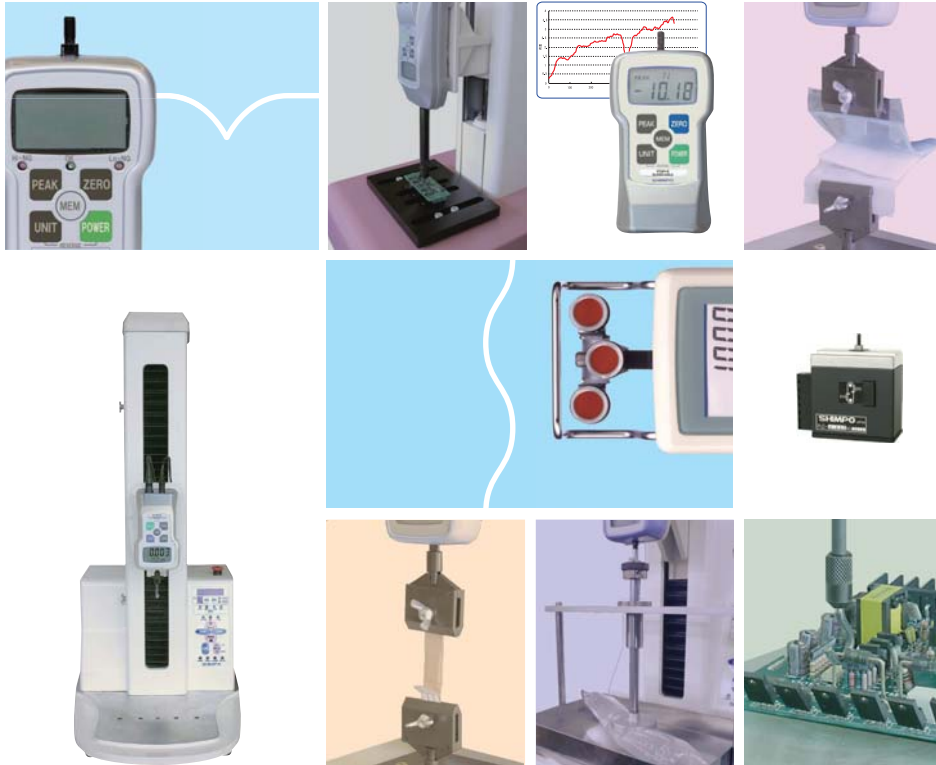
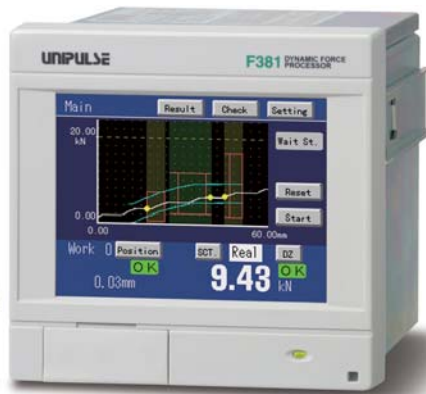


FORCE&TENSION MEASURING INSTRUMENTS



F381

SD CARD AVAILABLE GRAPHIC
DISPLAY/TOUCH PANEL TYPE
DYNAMIC FORCE PROCESSOR



Comparison & Hold Function by Waveform Display

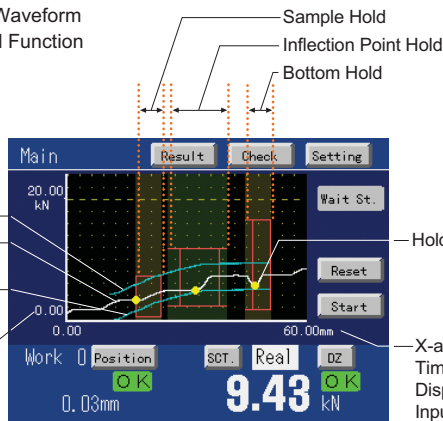
These functions are used to judge the acceptability of measurement waveforms. Depending on type of applications, Waveform Comparison Function and Multi Hold Function can be jointly utilized for judgment.

Waveform Comparison Function

Hi and Lo limit comparison of overall measurement waveform can be performed.

Hi Limit Setting
Measurement Waveform
Lo Limit Setting

Y-axis: Pressure, Load or Torque etc.



Multi Hold Function

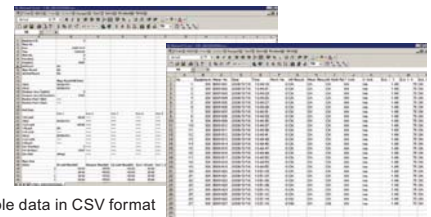
Type of hold can be selected at segmented measuring area.

Hold Point

X-axis:
Time or Displacement Input

Saves Measurement Data in SD Card

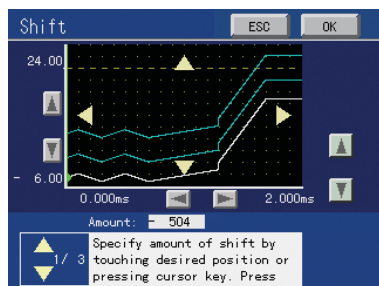
Measurement data and set values can be logged (recorded) in the SD Card where it can be retained as a 100% recorded quality data or be used when setting up equipments or when performing cause analysis or improvement of problems. The data can be easily converted to CSV format and is therefore easily edited in Microsoft Excel or its like.



Example data in CSV format

- CE marking certification
- RoHS-compliant product
- 4000 times/sec high-speed processing
- Analog monitor output
Voltage output is proportionate to the input signal making the recording on recorder convenient. Approx. 2V per 1 mV/V strain gauge input
- A variety of interfaces
RS-232C / DeviceNet / CC-Link / Ethernet
- 3.5-inch color LCD module & touch panel
Operation can be effortlessly performed by a direct touch on the touch panel.
- Excellent operability
F381 is right-down demanding on straightforwardness and is therefore made able to automatically masks non-required setting items and also to display setting in the required sequence when that particular set item has specific setting sequence.
- I/O Input: Plus common / Minus common shared
I/O Output: Sink type / Source type selectable.
It can be connected to various types of external equipments such as PLCs.

Waveform Comparison Function



This function compares the actually measurement waveform against the setup High/Low limit waveforms and will give out an NG judgment when any of the point exceeded the set High/Low limit waveforms. As it compares the measurement waveform in overall, accurate judgment can be made even in applications that are unable to narrow down its judgment points.

▲ Setup Waveform Creation Screen

The High/Low limit waveforms can be easily created on the actual measurement waveform or on the setup waveform creation screen.

Multi Hold Function

After the measuring range is segmented, judgment is carried out while the type of hold (sample, peak, bottom, P-P, max, min, inflection point, End Displacement) is interchanged at will. The multi hold function can specify the Hi/Lo limit value and type of hold at each of the segmented range. Multipoint judgment is possible because the multi hold function is capable of using the peak hold to detect the inhibit timer immediately after the press-fit is started and then uses the inflection point hold to judge the load just before the ramming is commenced.

Displacement Input as a Standard Equipment

It performs 2-dimensional waveform comparison & multi hold through its dual input from the displacement sensor and strain gauge sensor. On X-axis, voltage or pulse input can be connected while on Y-axis, strain gauge sensor can be connected. This is highly effective for applications which are difficult to control only by time factor such as the control for pressing time of press machines and for the imposing time on works with individual differences.
※When nothing is connected with X-axis, Waveform Comparison & Multi Hold by the time series can be done.
※The voltage input is an option.

List of Judgment Results Display

The judgment results of Waveform Comparison Function and Multi Hold Function can be verified on the list display. NG points are marked in red.

Result			
Wave No. : 12345678901234567890			
Work 0	X (kN)	Y (mm)	
SCT. 1	-----	-----	NG
SCT. 2	-----	-----	NG
SCT. 3	-----	-----	NG
SCT. 4	-----	-----	NG
SCT. 5	-----	-----	NG
Wave	-----	-----	OK

A wave No. can be set on each waveform. It is convenient to retrieve the data preserved on the SD card.

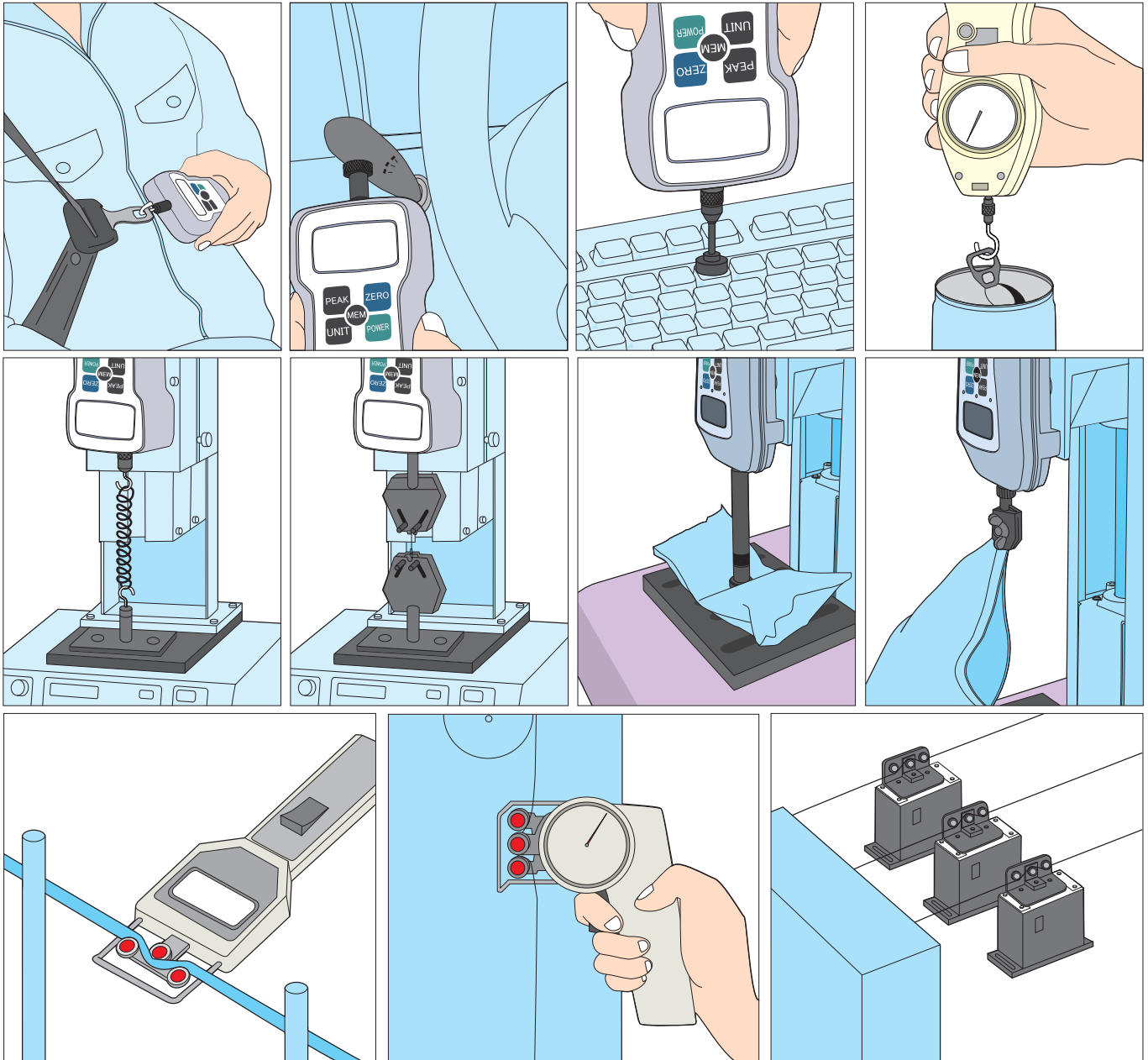
UNIPULSE

Measuring Instruments Products Catalogue

CONTROL THE R&D OR QC BY NUMERIC VALUE THROUGH PERSONAL TOUCH

Nidec-Shimpo responds to the demand of valued customers for their extensive measuring instruments.

● APPLICATION



Load Measuring Instruments : (Digital Force Gauge/All Types of Measuring Stands)

- Seat Belt Pulling Power/Force Opening
- Lever Press Power
- Switch, Key Board Operative Power
- Play-top Can Power
- Spring Characteristic Test
- Crimped terminal insertion-extraction power
- Polyethylene Press Power
- Cap Removing Power
- Seal, food stuffs etc. Peeling Power
- Sewing M/c. Eyelet thread etc. Cutting Power
- Cosmetics Compacts Switching Power
- Spray Work Power/Force

Tensile Strength Measuring Instruments : (Tension Meter)

- Magnetic Tape Tensile Strength Measurement
- Electrical Discharge Processing Tensile Strength Measurement
- Piano-wire, Ele. Wire etc. Tensile Strength Measurement
- Film Tensile Strength Measurement
- Rolled Paper Tensile Strength Control
- Optical Fiber Tensile Strength Measurement
- Roll Mfg. Process Tensile Strength Measurement
- Aluminum Foil Tensile Strength

Communication Intensifying Type
(With Output)

FGPX- □ Series

Industries Most Light Weight



High Capacity Type
(With Output)


FGPX- □H Series

Capacity 5000N



- 1) Connector for Digimatic Signals.
- 2) Connector for AC Adapter
- 3) Connector Outer Parts Connections.
- 4) USB Connector

USB	memory 1000	1000 Rev./Sec	RS-232C Output
D/A Analog Output	LED Comparator	Over Load	Reverse Indication
Push & Pull Peak	Hanger	Unit	TORIEMON USB
Digimatic	Outer Parts Tare.	Outer Signal	

Free Download 

Intensify Communication Function of Input/Output together.
From the exclusive data collection software via "Torieimon USB*", the test results could be transferred to P.C.
* From our web Page, Free Download is possible.

- **Decision Results Display through LED. Confirm at that point.**
LED Display for "HI, LO, OK" Signal Output also possible.
- **USB Communication.**
Data Collection is possible by connecting to the USB Port of P.C.
- **Digimatic Signal.**
Could be connected to Mitsutoyo Digimatic Printer.
- **Outer Parts Signal.**
Displayed Value Maintaining Hold Function, Tare Pulling, PEAK Mode Switching Function are built-in.

FGPX- □ Series

Type	Max. Load	
FGPX-0.2	± 2.000N	0.2kg
FGPX-0.5	± 5.000N	0.5kg
FGPX-1	± 10.00N	1kg
FGPX-2	± 20.00N	2kg
FGPX-5	± 50.00N	5kg
FGPX-10	± 100.0N	10kg
FGPX-20	± 200.0N	20kg
FGPX-50	± 500.0N	50kg
FGPX-100	± 1000N	100kg

FGPX- □H Series

Type	Max. Load	
FGPX-250H	± 2500N	250kg
FGPX-500H	± 5000N	500kg

Power Supply: AC Adapter or Inbuilt Nickel Hydro. Battery (Rechargeable)
Accessories: Measuring Adapters 6 Types (Ref. Page 5). Hanger, AC Adapter, Carrying Case, USB Cable, Handle (FGPX- □ H Series Only)

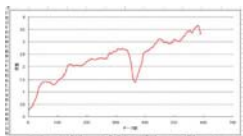
For Details Refer Page 11 ~ 12

For POWERFUL MEASUREMENT

FGP-FGPX Series

USB Communication

Data collection is possible by connecting to USB port of P.C.



Communication Function Enrichment

Exclusive Data Collection Software

TORIEMON USB

Through connecting the USB Cable to PC, from the exclusive data collection software "Torieimon USB" (From our Co.'s Home Page, Free Download possible) Test Results could be collected to PC.

Torieimon USB Function

Trigger (After attaining the set load, Data collection starts)
Independent Data Collection (Measurement Data, ± Peak Data)
Continuous Data Collection.
Collection Frequency: Setting up to 65,000 items is possible.
Collection Interval: 10, 20, 50, 100 Revolutions/Second.
Memory Data Collection.



* Excel is the Microsoft Trade Mark

High Function Type (with Output)
FGP- □ Series

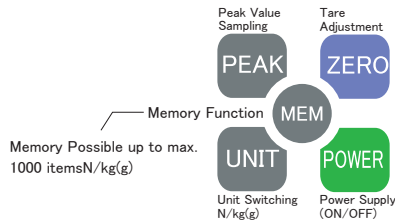
Rich Measurement Function



Wide Variation with Motor Testing Stand and Set.
 From "Toriemon USB*" Test Results could be collected in P.C.

* From our web Page, Free Download is possible.

- **USB Communication:**
Through Interface, the USB employed Data collection could be easily passed with PC Link.
- **Memory Function:**
Three types of Memory Modes viz. Continuous Memory, Independent Memory, Standard Memory could be prepared.
- **Wide Variation through Motor Testing Stand and Set.**
- **Comparator Function In-built.**
With the Upper Limit & Lower Limit Value Settings, Yes/No Judgment could be made.



USB	memory 1000	1000 Rev./Sec	RS-232C Output
D/A Analog Output	Comparator	Over Load	Reverse Indication
Push & Pull Peak	Hanger	Unit	TORIEMON USB

Free Download

Type	Max. Load	
FGP-0.2	± 2.000N	0.2kg
FGP-0.5	± 5.000N	0.5kg
FGP-1	± 10.00N	1kg
FGP-2	± 20.00N	2kg
FGP-5	± 50.00N	5kg
FGP-10	± 100.0N	10kg
FGP-20	± 200.0N	20kg
FGP-50	± 500.0N	50kg
FGP-100	± 1000N	100kg

Power Supply : AC Adapter or In-built Nickel Hydro. Battery (Rechargeable)

Accessories : Measuring Adapters 6 Types (Ref. Page 5), Hanger, AC Adapter, Carrying Case, Exclusive USB Cable

For Details Refer Page11 ~ 12

1000 Rev./Sec	Reverse Indication	Push & Pull Peak	Hanger	Unit
---------------	--------------------	------------------	--------	------

Type	Max. Load	
FGJN-2	20.00N	2kg
FGJN-5	50.00N	5kg
FGJN-20	200.0N	20kg
FGJN-50	500.0N	50kg

Power Supply: AC Adapter or In-built Nickel Hydro. Battery (Rechargeable)

Accessories: Measuring Adapters 6 Types (Ref. Page 5), Hanger, AC Adapter, Carrying Case, Exclusive USB Cable

Economy Type (without Output)
FGJN Series

Measurement results by digital indicator



- Rated Capacity 20.00N (2.000kg) ~ 500.00N (50.00kg).
- With One Touch, Numeric Value Display and Unit Display could be inadvertently displayed by Reverse System.
- Switching over of every unit of N, kg(g) is possible with One Touch.
- Peak Value Measurement (Peak Hold) is possible respectively for Plus Side or Minus Side..
- High Speed Peak Measurement of 1000 Revolutions Per Second.
- Measuring Frequency (Display Cycle) could be selected from max. 20 Revolutions Per Second.

For Details Refer Page11 ~ 12

USB USB Communication Function Furnished.	1000 Rev./Sec High Speed Peak Measurement of 1000 Rev./Sec. is possible.	Motor Automatic Measurement is possible through the Motor.	Digimatic Could be connected to Mitsutoyo Digimatic Printer.
RS-232C Output Could be connected to P.C. or Printer.	D/A Analog Output Connecting to Pen Recorder, Data Registration is possible.	Manualr Manually Speedy Measurement is possible.	LED Comparator Upper/Lower Limit Setting, Judgment Output is possible. (LED Display)
Hanger For Storage or Suspension Hanger is attached.	Unit N,kg(g) Unit Switching is possible.	Digital Indication Forwarding Speed and Shifting Distance Digital Display.	Outer Parts Tare Tare Pulling is possible through Outer Parts Signal.
Comparator Upper/Lower Limit Setting, Judgment, Output is possible.	Over Load At the time of Over Load, Signal is displayed and could be used for Machine Protection.	Analog Output Connecting Pen Recorder, Shifting Distance Recording is possible.	Outer Parts Signal Display Value Preservation Hold Function, Tare Adjustment, PEAK Mode Switching is possible.
Reverse Indication LED Display Numeric Values and Unit could be Top-Bottom inversible is possible.	Push & Pull Peak Recording of Press, Pull respective Values is possible.	Program Setting Movement Program Setting is possible.	
memory 1000 Up to 1000 Items, Continuous Memory Measuring Data is possible. Max., Min. etc. Corresponds to Statistics Processing.	Corresponding Measuring Meter Mitsutoyo made Measuring Meter (Optional) could be installed.	TORIEMON USB *1 TORIEMON *2 RHEOEMON *3 FGT-TV	

Through the Exclusive Free Software. Data Collection is possible.

*1. Toriemon USB is exclusively for FGP/FGPX Series.

USB Communication Function could be furnished with easy connection to P.C. Working Environment: DOS/V Substitution Windows XP, Excel 2003/2007

*2. Toriemon is exclusively for FGC-250HB Series. Working Environment: DOS/V Substitution Windows XP, Excel 2003.

*3. Rheoemon is exclusively for FGR- □ Series. Working Environment: DOS/V Substitution Windows XP, Excel 2003.

Analog Force Gauge
MF- □ N Series

Rich Measurement Function



No Power Supply Necessary and Excellent Visibility Analog Force Gauge

- Tension . Compression Both Directions Measurement is possible.
- Due to Aluminum Die-Cast, Firm and Solid Structure.
- Peak Value displayed by Dial-Gauge System.



Carrying Case

Type	Max. Load	
MF-10N	10N	1.020kg
MF-20N	20N	2.039kg
MF-30N	30N	3.059kg
MF-50N	40N	5.099kg
MF-100N	100N	10.20kg
MF-200N	200N	20.39kg
MF-300N	300N	30.59kg
MF-500N	500N	50.99kg

Accessories : Measurement Adapters 8 Types (Refer below)

Sensor Isolated Type Digital Force Gauge
FGPX-RT Series

Measurement is possible, even at Narrow Space also

* Regarding Corresponding Sensor Parts, Inquire Separately.



Measurement Part

Displayed

- Due to Exchangeable Sensor Parts, it corresponds to wide range load ($\pm 2.000N \sim \pm 1000N$).
- Till Date no Equipment ever entered such a narrow place, Even at isolated place also, measurement is possible.
- Load Cell Calibrated Data could be memorized in 5 types, in this machine.
- With the exclusive data collection "Toriemon USB" the measured values could easily be downloaded in P.C.

* For Details, please refer Page 3.

USB	memory 1000	1000 Rev./Sec	RS-232C Output
D/A Analog Output	Comparator	Over Load	Reverse Indication
Push & Pull Peak	Hanger	Unit	TORIEMON USB



Power Supply : AC Adapter or In-built Nickel Hydro. Battery (Rechargeable)

Accessories : Measuring Adapters 8 Types (Ref. Below). Carrying Case

For Details Refer Page 11

Attached Measurement Adapter
 (As set of Accessories to the Machine)

FGPX FGP FGN (M6 用)	Round Drill 70°	Mountain Shape 70°	V Groove 70°	φ 12mm	Hook	L : 92mm
If less than 0.5N is selected, then Measuring Adapter for M4 is offered as accessories.						
MF (M6 用)	Round Drill 90°	Mountain Shape 90°	V Groove 90°	φ 15mm	Hook	L : 90mm
The above mentioned + Big Hook, or Hook Meter thus would be totally 8. Related to 200N~500N Accessories, Inquire Separately.						

The Shapes would somewhat be different according to the size. For details, please inquire.

HARDNESS MEASURING
EQUIPMENT – RHEO TESTER
FGRT- □ Series

Stress Measuring



A from the exclusive data collection
Software "Rheomon" USB function*
Measuring Values could be easily fed to P.C.

* From our web Page, Free Download is possible.

- Not Load, but corresponding to the Object receiving Outer Force, the resistance expressed by Inner Parts is measured.
- By Comparator Judgment Display, suitability is decided.
- With Memory Function, 1000 Items Measured Data is memorized.

RHEOMON

Trigger (After attaining the set load, Data collection starts)
Independent Data Collection (Measurement Data, ± Peak Data)
Continuous Data Collection.
Collection Frequency: Setting up to 65,000 items is possible.
Collection Interval: 10, 20, 50, 100 Revolutions/Second.
Memory Data Collection.

USB	memory 1000	1000 Rev./Sec	RS-232C Output
Comparator	Over Load	Reverse Indication	Push & Pull Peak
RHEOMON			

Free Download

Type	Max. Load
FGRT-1	± 10N
FGRT-2	± 20N
FGRT-5	± 50N
FGRT-10	± 100N

Power Supply: AC Adapter or In-built Nickel Hydro. Battery (Rechargeable)
Accessories: Measuring Adapters 6 Types (Ref. Page 5).

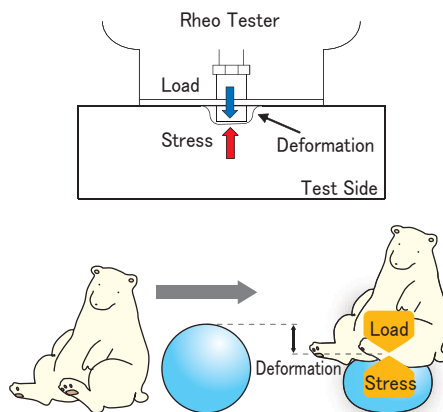
For Details Refer Page 11

Measure the respective Hardness by Digital

The "Texture" of Bread or Cake, Flesh or Fish, Variety of Noodles, as also Sitting Comfort of Chair or hardness of Cosmetics, Stiff Shoulders condition, "Sense of Touch" etc., the most suitable "Feelings" could be indicated by Numeric Values.

How the Hardness is Measured?

If the pressed load is cracked at the pressed unit area, then the stress could be measured.
The stress shown by the targeted object becomes the index of hardness.
The Unit considered is Pa(Pascal)[N/m²]
Fitting the Press Jig to the Digital Force Gauge, pressing the targeted object, measurements could be taken.
Of-course, the measurements could be taken by attaching stress exclusive function to the Force Gauge.



**Data Measurement
Wireless Transceiver Equipment.**

BETRIX CO. LTD.
TELEMEASURE

Instantly, as soon as measured, Automatic Input

Telemeasure is the Equipment, if fitted with the Ultra small type wireless transmitter to the Measurement Equipment, through the Data Receiver connected to the P.C., then automatically the measured data is fed into the P.C. without wire.
The Inspection Result Table or Histogram etc., all varieties of Q.C. Control Sketches etc., could be prepared immediately.

- Data Recording Notebook not necessary.
- Cable-less Operations are widely improved.
- All types of measurement data is fed to a P.C.
- Real Time Cancel Function.



Through the ID Number set switch, maximum 100 transmissions of measurement equipment numbers could be assigned.

Measured Data is received and automatically fed in PC. !
Without Wire/With Wire – 2 methods are available.

QC PRO
The measured data automatically recording, calculating, analyzing Software. Easy Operation with High Level Business-like.

QC PRO EX
The measured data transmitted through Telemeasure Transmitter etc., automatically gets entered into the Excel Work Sheet. through this Add-In-Software.

Transmitter Specifications	
Wireless Frequency	VHF 273MHz Weak Waves
Transmission Distance	10 m visibility
Input Signal	Digimatic / RS-232C
Power Supply	Coin Battery CR2032
Outer Dimensions/Wt.	32W x 52D x 13H/23g.

Data Receiver DR30 Specifications	
Wireless Specifications	Receiving Distance 10 m. Wireless Frequency VHF273MHz
With wire input	Digimatic Signal Flat 10 Pin x 2
P.C. Output	RS-232 D-sub 9 Pin
Mini Printer Output	Digimatic Signal Flat 10 Pin
ID Passing Limit Function	Setting as per Dip Switch
Buzzer Sound Setting	Setting as per Dip Switch
Working Environment	Temp.0 ~ 40°C / Humidity 20 ~ 40% RH
Power Supply	AC 100V (Adapter DC 9V)
Outer Dimensions	165 W x 86 D x 30 H Excluding Rubber Shoes, Antenna Parts



LOAD SIMPLE TEST STAND
 FGS-50E-L (Low Speed Specifications)
 FGS-50E-H (High Speed Specifications)

LONG STROKE MOTOR STAND



Stroke is 400mm.
 Operation is simple and it corresponds to various works.

- It corresponds to 4 action modes.
 Manual/Short movement/1 Cycle/Return Repetition
- Safety front face cover.
- Forwarding Speed - 2 Types.
 Low Speed Specifications 6 ~ 180mm/min
 High Speed Specifications 20 ~ 600mm/min
- Due to (LED) Indication, for all types of settings, easy to see, operatically is upgraded.
- Free Current -
 Wide range of input current from AC100V ~ 240V.

Motor	Over Load	Digital Indication	Program Setting
-------	-----------	--------------------	-----------------

Type	Max. Load
FGS-50E-L	500N
FGS-50E-H	

Possible Installation to Machines	
FGS-50E-L	FGS-50E-H
FGJN-2 ~ 50	
FGP-0.2 ~ 50	
FGPX-0.2 ~ 50	

For details refer to pages 13 ~ 14

VERTICLE TYPE - FORCE GAUGE EXCLUSIVE MOTOR STAND
FGS-100VC/250VC
 VERTICLE TYPE - HANDLE STYLE FORCE GAUGE STAND
FGS-100HB/250HB

Wide range measuring



To the Vertical Model Stand - Motor type, handle type, line up is added.
 With considerable wide spread scope, high accuracy measurements are realized. All types of force gauges could be installed.

- COMMON**
- Corresponds up to 2N ~ 2500N(0.2kg ~ 250Kg).
 - Stroke : Max. up to 400mm.
 - Measuring Table : 150 × 200mm.

- FGS-□VC**
- Exclusive Data Collection Software "FGT-VC*". Simultaneously collects the force gauge load data and stand movement distance.
 - Corresponds up to 2N ~ 2500N (0.2kg ~ 250kg). LED Indication is applied to display panel.
- * From our web Page, Free Download is possible.

- FGS-□HB**
- With the handle operation, ultra small movement is possible.
 FGS-100HB : Handle - 1 Rotation about 1.33mm
 FGS-250HB : Handle - 1 Rotation about 0.55mm

Motor	USB	Analog Output	Over Load	Free Download
Digital Indication	Corresponding Measuring Meter	Program Setting	FGT-VC	

Type	Max. Load
FGS-100VC	1000N
FGS-250VC	2500N

Manual	Type	Max. Load
	FGS-100HB	1000N
	FGS-250HB	2500N

Possible Installation to Machines	
FGS-100VC/FGS-100HB	FGS-250VC/FGS-250HB
FGJN-2 ~ 50	FGJN-2 ~ 50
FGP-0.2 ~ 100	FGP-0.2 ~ 100
FGPX-0.2 ~ 100	FGPX-0.2 ~ 100
-	FGPX-250H,500H

For details refer to pages 13 ~ 14



Small Type Table Top Testing Machine
FGS-TV

As a Test Machine, Rich Results



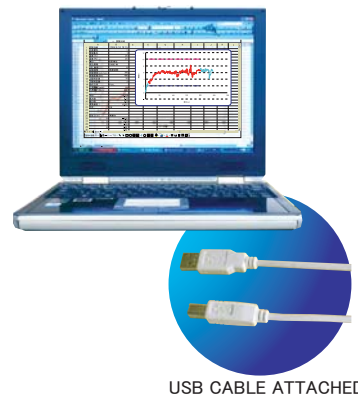
With Digital Force Gauge and Motor Stand, Exclusive Add-In Software "FGT-TV" attached to a machine set for High Ability, High Function Small Type Table Top Testing Machine.

* For Digital Force Gauge (FGP) other than given in theSet, please enquire separately.

- Stand Equipment for all types of Measurement Modes
 Compression.
 Tensile Test
 Peel Off Test
 Destruction Test
 Reciprocating test
 Force detection test
- USB Communication
 Built-in USB Port. Connecting to the P.C. USB Port, Data Collection and Operations from the P.C., viz. Start, End, Action Selection etc. could be possible.
- Attaching exclusive software, Inserting Load and Deformation Data, Graph Display is possible. Data is directly inserted to Excel.

* Working Environment: DOS/V Interaction Windows XP-7, Excel 2003, 2007

With the exclusive software Peeling Off Power variations are Displayed on P.C. (Image Sketch)



USB CABLE ATTACHED.



Width 468 x Depth 234 x Height 206mm

Motor Type Horizontal Model
FGS-50XB-L (Low Speed Specifications)
FGS-50XB-H (High Speed Specifications)

**Select as per Measuring Environment
 - Horizontal Model Specifications**

According to Measuring Objective, Utility, Small Movement Action or Retrospective Repetition, Return Action etc. freely select the Force Gauge Movement.

Stroke : 140mm
 Measuring Table : 100 x 125mm

Motor	Analog Output	Over Load	Digital Indication
Program Setting	Corresponding Measuring Meter		

Type	Max. Load
FGS-50XB-L,H	500.0N(50kg)
Possible Installation to Machines	
FGS-50XB-L	FGS-50XB-H
FGJN-2 ~ 50	
FGP-0.2 ~ 50	
FGPX-0.2 ~ 50	



Width 160 x Depth 240 x Height 320mm

Manual Lever Type
FGS-5S

**Handy No.1 Press Power
 Testing Machine**

Could be used even as a Horizontal Model.
 Up to 200.0N Load Measuring is possible.

Stroke : 50mm
 Measuring Table : 150 x 160mm

Manualr	Corresponding Measuring Meter
---------	-------------------------------

Type	Max. Load
FGS-5S	200.0N(20kg)
Possible Installation to Machines	
FGJN-2 ~ 20	
FGP-0.2 ~ 20	
FGPX-0.2 ~ 20	



Width 230 x Depth 290 x Height 562mm

Manual Lever Type
FGS-50L

**Most suitable Lever Type
 for Speedy Measurements**

Load Measurements Up to 500.0N is possible.

Stroke : 50mm
 Measuring Table : 150 x 145mm

Manualr	Corresponding Measuring Meter
---------	-------------------------------

Type	Max. Load
FGS-50L	500.0N(50kg)
Possible Installation to Machines	
FGJN-2 ~ 50	
FGP-0.2 ~ 50	
FGPX-0.2 ~ 50	



Width 160 x Depth 240 x Height 320mm

Manual Handle Type
FGS-50H

**With the Handle Operation,
 ultra small movement is possible**

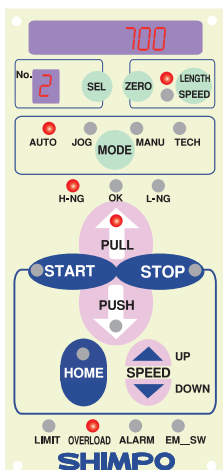
Load Measurements Up to 500.0N is possible.
 Height Control with each 30mm at 6 steps.

Stroke : 150mm
 Measuring Table : 150 x 145mm
 Handle 1 Rotation : about 3mm

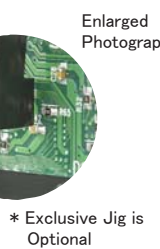
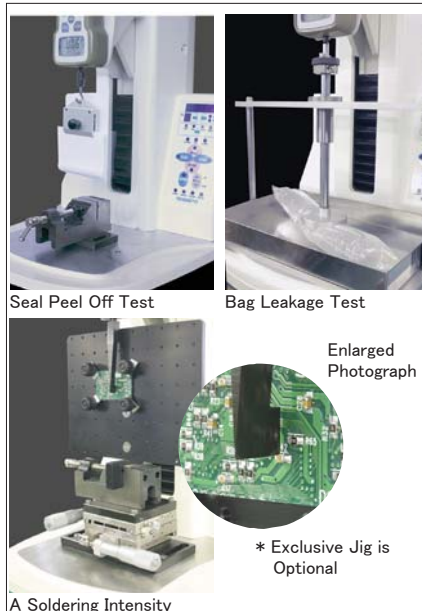
Manualr	Corresponding Measuring Meter
---------	-------------------------------

Type	Max. Load
FGS-5H	500.0N(50kg)
Possible Installation to Machines	
FGJN-2 ~ 50	
FGP-0.2 ~ 50	
FGPX-0.2 ~ 50	

● Convenient Functions for Testing are fully loaded.
 Excellent Operatically Key-Panel.



- Distance and Speed
- Change Programmed and Manual
- Light Switch turns on at Up-Down Limit Value Judgment
- Programmed Start and Manual Operation
- Alarm Indication








* Exclusive Jig is Optional





Motor	USB	Analog Output	Over Load
Digital Indication	Program Setting	FGT-TV	




Type	Max. Load
FGS-2TV	2N(0.2kg)
FGS-5TV	5N(0.5kg)
FGS-10TV	10N(1kg)
FGS-20TV	20N(2kg)
FGS-50TV	50N(5kg)
FGS-100TV	100N(10kg)
FGS-200TV	200N(20kg)
FGS-500TV	500N(50kg)
FGS-1000TV	1000N(100kg)
FGS-5000TV	5000N(500kg)
Possible Installation to Machines	
FGP-0.2 ~ 100	
FGPX-0.2 ~ 500	

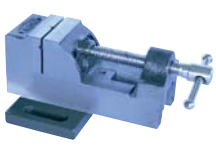
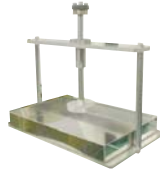


Stroke : 400mm
 Forwarding Speed : 1 ~ 700/min
 Measurement Table : 200 x 190mm
 Sampling : 100 Samples/sec
 Accessories : USB Cable (1.8m)




Exclu-sive Jig (Optional)






One Touch Film Chuck		Wedge Chuck		Pantograph Chuck		Flat Chuck		Fine Point Chuck	
									
Model	FGTT-20-20	Model	FGTT-532	Model	FGTT-21	Model	FGTT-533	Model	FGTT-22-M6
Width	20mm	Open Width	0 ~ 5mm	Open Width	15mm	Width	35mm	Open Width	0.5mm
Open Width	0 ~ 2mm					Open Width	0 ~ 30mm		
Weight	100g	Weight	1.5kg	Weight	200g	Weight	1.5kg	Weight	30g
Allowable Load	200N	Allowable Load	5000N	Allowable Load	500N	Allowable Load	5000N	Allowable Load	100N

Cam Chuck		Oblique Chuck		Roulette Cam Type Attachment					
				<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Below</p>  </div> <div style="text-align: center;"> <p>Above</p>  </div> </div>					
Model	FGTT-23	Model	FGTT-523	Model	FGTT-24	Model	FGTT-27	Model	FGTT-26
Sample Width	30mm	Sample Width	50mm	Open Width	1mm	Open Width	10mm	Open Width	4.0mm
Sample Thickness	2mm	Sample Thickness	4mm						
Weight	200g	Weight	1.0kg	Weight	100g	Weight	1.0kg	Weight	150g
Allowable Load	500N	Allowable Load	2000N	Allowable Load	100N	Allowable Load	1000N	Allowable Load	250N



Rotation Type Crimped Terminal Catching Attachment		For Corrugated Paper Seal Can Intensity Hook		Wire Clamp Jig		Both Vice Jig		T Groove Surface Plate	
									
Model	FGTT-28	Model	FGTT-29	Model	FGTT-25	Model	FGTT-30	Model	FGTT-31
Slit	12	Hook Width	60mm	Open Width	5mm	Open Width	70mm	Open Width	150mm
Weight	500g	Weight	150g						
Allowable Load	1000N	Allowable Load	250N	Allowable Load	500N	Allowable Load	1000N	Allowable Load	5000N

Vice Jig		Leak Test Jig		Solder Test Jig		Bending Jig			
									
Model	GT-30-1	Stroke	110mm	Installation Board Dimensions	200 × 150mm	Model	FGTT-32	Model	FGTT-531
Width	38mm					Width	60mm	Width	100mm
Opening	39mm	Tray Inner	266 × 172mm	XY Table Movement Quantit	12.5mm	Sample Width	10 ~ 60mm	Sample Width	5 ~ 70mm
Allowable Load	500N					Weight	150g 6.4kg	Weight	220g 6.2kg
						Allowable Load	500N	Allowable Load	5000N

Pin Chuck				Film Chuck		Small Chuck				
										
Model	(4PC-0.5) 6PC-0.5	(4PC-1) 6PC-1	(4PC-1.5) 6PC-1.5	(4PC-2B) 6PC-2B	Model	(4FC-20) 6FC-20	Model	(4SC-3) 6SC-3	(4SC-8) 6SC-8	
Diameter	φ0 ~ 0.5mm	φ0.5 ~ 1mm	φ1 ~ 1.5mm	φ1 ~ 2mm	Width	20mm	Width	3mm	8mm	
	Weight	about 14g	about 14g	about 14g	Opening	2mm	Opening	2mm	3mm	
Allowable Load	150N	150N	150N	150N	Weight	about 75g	Weight	about 25g	about 26g	
						Allowable Load	500N	Allowable Load	100N	150N

Film Chuck		Wedge Chuck		Flat Model Chuck		Winding Chuck		Round Bar Chuck	
									
Model	GC-2-5	Model	GC-10-2	Model	GC-40	Model	GC-20	Model	GC-50
Width	50mm	Width	20mm	Width	M10	Chuck diameter	φ 32	Width	8mm
Diameter	0 ~ 2mm	Opening	0 ~ 19mm	Opening	Flat plate and knob type	Grip Dia	φ 0.5 ~ 5mm	Opening	0 ~ 4mm
Weight	about 150g about 420g	Weight	about 180g about 450g	Weight	about 100g about 370g	Weight	about 160g about 425g	Weight	about 200g about 470g
Allowable Load	500N	Allowable Load	500N	Allowable Load	500N	Allowable Load	500N	Allowable Load	500N

Force Gauge Installation
Stand Installation Side

One Sided Roller Chuck		X-Y Table	
			
Model	GC-60	Model	GT-20-3
Roller diameter	φ 8	Shift Qty	± 30mm
Width	32mm	Upper Surface Plat Dimensions	90 × 90mm
Weight	about 170g / about 440g	Allowable Load	500N
Allowable Load	500N	Allowable Load	500N

- Corresponding Machine Types.
FGPX-1 ~ FGPX-100
FGP-1 ~ FGP-100
FGJN-2 ~ 50
(Bracket) Inside is for the models which is less Than FGPX-0.5, and FGP-0.5.
 - Less than 5N, Digital Force Gauge Measurement Adapter Installation Bolts are M4.
• In case of M4, Please Select the (Bracket) Model Type Measurement Adapter.
• Others would be of M6.
 - In case of High Load, for (M10), Please Inquire
- Special Jigs other than these (Exclusive for Peel Off Chuck etc.)
Test Machines could be Manufactured. Please Consult without fail.

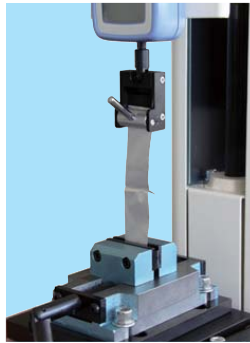
APPLICATION



Bag Seal Opening Power Check



Straw Pulling Power



Solder Intensity



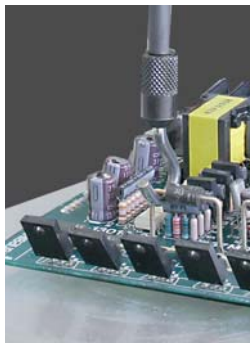
Crimping Power Check of Crimped Terminal.



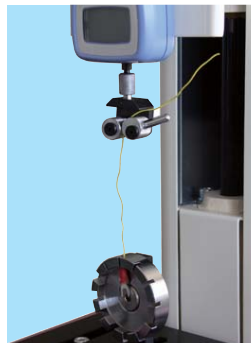
Rubber Pulling Power



Synthetic Fibre Pulling Power



Plastic Bag Press Power



Food Stuff Hardness



Sealed (Lid) Peeling Off Power



Wrapping Adhesion Peel Off Power

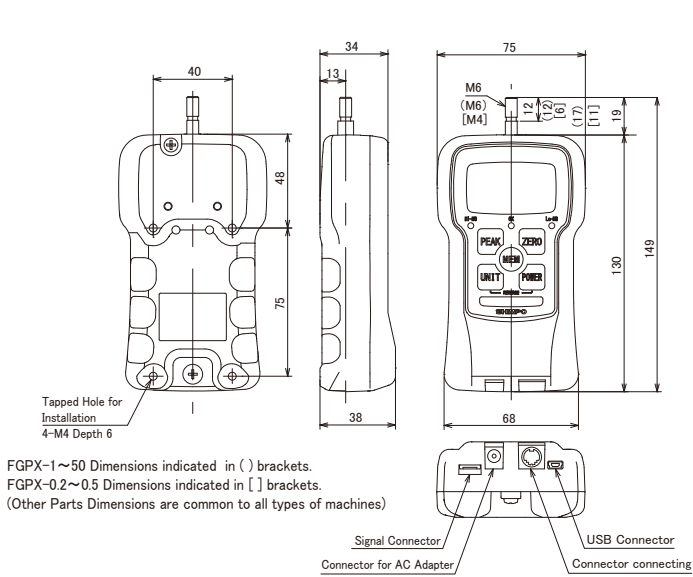


Card Sheet Bonding Peel Off Power

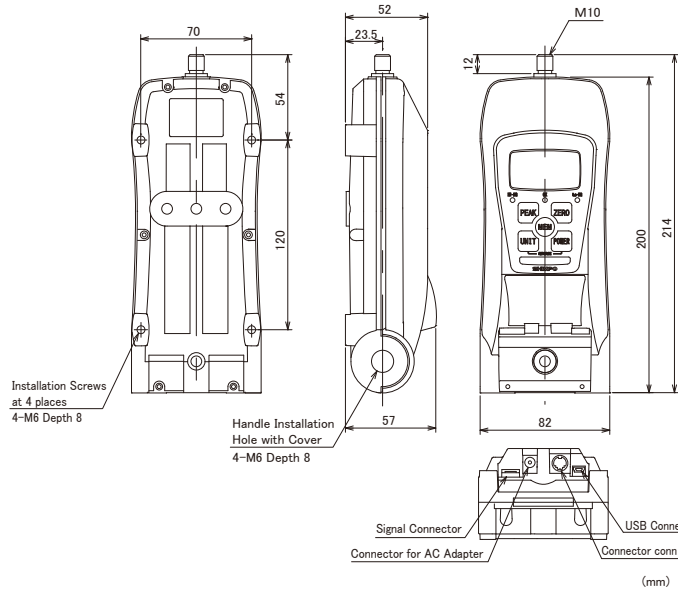
**Indispensable for Quality Control.
For All Varieties "POWER" Measurements.**

Dimensional Drawing

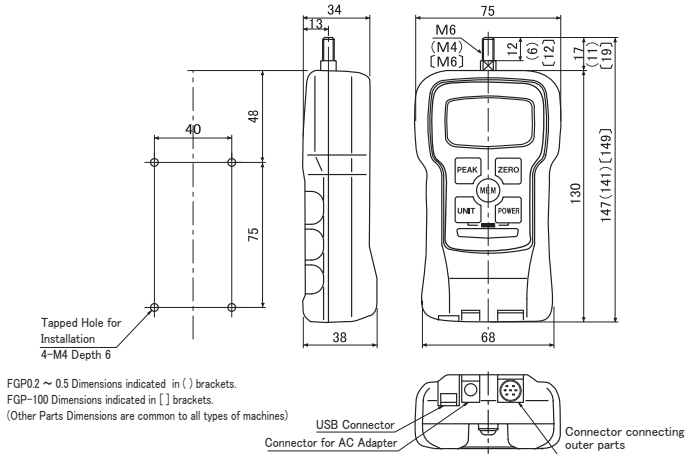
FGPX- □



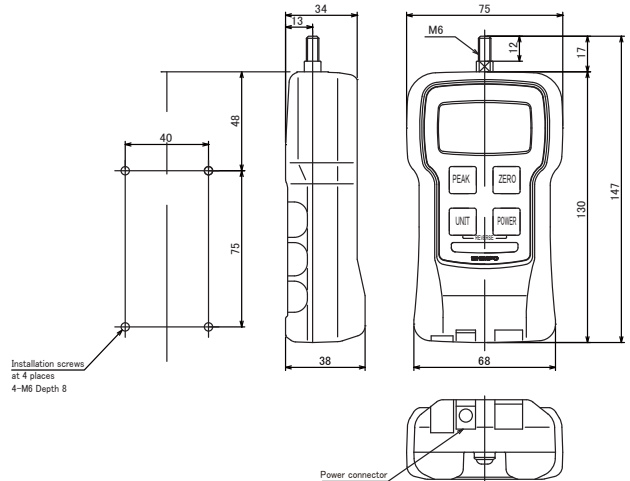
FGPX-250H/500H



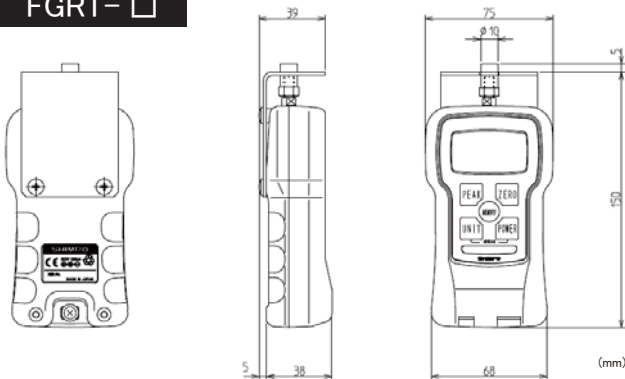
FGP- □



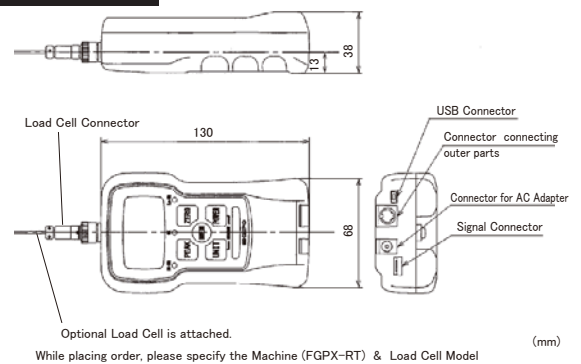
FGN- □ B



FGRT- □



FGPX-RT



Model	FGRT-1/2/5/10
Rated Load Capacity (N)	± 10N/20/50/ ± 100N
Unit	kPa(KiloPascal)
Measurement Method	Normal Measurement, Peak Measurement
Display Intervals	could be selected from 1,2,3,5,10,20 Revolutions/Sec.
Sampling Interval	1000 Rotations/Sec
Accuracy	± 0.2% ± 1/2digit
Comparator Function	Upper Limit, Lower Limit NG Pass/Acceptance Decision could be possible
Memory Function	Max. 1000 items could be memorized
Communication	USB/RS-232C
	Digimatic
Output	Analogue
	Over Load
Input	Upper Limit, Lower Limit, NG Pass/Success
Current	● ZERO Tare Pulling, Peak Rest ● HOLD Display preservation ● PEAK Set Measurement Mode
	Inner Stored Nickle Hydrogen Battery, AC Adapter (DC9V/200mA)

Model	FGPX-RT- □
Load Cell	● Isolation Model Load Cell Max 5 ● Max. 5 types of calibrated data storage memory
Measurement Unit	N Unit or kg Unit (Reverse Display possible)
Measurement Method	Normal Measurement . Plus Peak, Minus Peak
Sampling Interval	1000 Rotations/Sec
Display Intervals	could be selected from 1, 2, 3, 5, 10, 20 Revolutions/Sec
Display Part	LCD
Current	● Inner Stored Nickel Hydrogen Battery ● AC Adapter (DC9V/200mA)
Battery Working Period	About 8 Hrs
Comparator Function	Hi,NG, OK, Lo,NG Precision, Output asper Decided LED and Output Signal
Analogue	± 1V
Communication	USB, RS-232C, Digimatic
Output	● Over Load/ PUSH, PULL ● Comparator/ HI,OK,LO
Input Signal	ZERO, HOLD
Memory	1000 Items
Outer Dimensions, Mass	Width 75 × Thickness 38 × Length 140mm, 300g
Accessories	USB Cable, AC Adapter, Carrying Case

Regarding Corresponding Sensors, please enquire separately.

■ FGPX Series/FGPX- □ Series

Model	FGPX-0.2	FGPX-0.5	FGPX-1	FGPX-2	FGPX-5	FGPX-10	FGPX-20	FGPX-50	FGPX-100	FGPX-250H	FGPX-500H	
Rated Capacity (RC) ^{Note1}	± 2.000N (± 200.0g)	± 5.000N (± 500.0g)	± 10.00N (± 1000g)	± 20.00N (± 2.000kg)	± 50.00N (± 5.000kg)	± 100.0N (± 10.00kg)	± 200.0N (± 20.00kg)	± 500.0N (± 50.00kg)	± 1000N (± 100.0kg)	± 2500N (± 250.0kg)	± 5000N (± 500.0kg)	
Display Possible Scope	± 2.000N (± 200.0g)	± 5.000N (± 500.0g)	± 10.00N (± 1000g)	± 20.00N (± 2.000kg)	± 50.00N (± 5.000kg)	± 100.0N (± 10.00kg)	± 200.0N (± 20.00kg)	± 500.0N (± 50.00kg)	± 1000N (± 100.0kg)	± 2500N (± 250.0kg)	± 5000N (± 500.0kg)	
Display Resolution Power	0.001N/0.1g		0.01N/1g	0.01N/0.001kg			0.1N/0.01kg		1N/0.1kg			
Unit	N, kg Unit Switchover (Reverse Indication possible)											
Measuring Method	Normal Measurement, Plus Peak, Minus Peak											
Display Interval	1 Rotation/Second, 2 Rotations/Second, 3 Rotations/Second, 5 Rotations/Second, 10 Rotations/Second, 20 Rotations/Second											
Sampling Interval	1000 Rotations/Second											
Accuracy	± 0.2% R.C. or ± 1/2 Digit (at 23°C) ^{Note2}											
Display Equipment	● With LCD Tag 4 digit indication (Letter Height 12mm) ● Output dependent on Decided LED and Output Signal											
Overload Weight Resistant	200% R.C.								150% R.C.			
Comparator Function	Hi,NG, OK, Lo,NG Decision, Output according to decided LED and Output Signal											
Communication	With USB (with exclusive communication software, communication with P.C. is possible. Connecting Cable is Standard Accessory). With RS-232C, (with exclusive communication command, communication with P.C. is possible. Connecting Cable is Optional) Digimatic : could be connected with Mitsutoyo Digimatic Printer DP-1VR .											
Analogue	● ± 1V. (As against the Output ± Indication Possible Scope), Accuracy ± 50mV, 12 bit/D/A Converter Method ● Output Update 1000Revolutions/Second, Zero Setting is possible, Load Resistance More than 10k Ω											
Output	Overload PUSH, PULL Open Corrector Output (Max. DC30V/5mA) Comparator Hi,OK,LO Open Corrector Output (Max. DC30V/5mA)											
Input Signal	ZERO (Outer Parts Zero Setting), HOLD (Outer Parts Hold)											
Current	● AC Adapter (DC9V/200mA) or Inner Stored Nickle Hydrogen Battery (Rechargeable) ● During Recharging Measurements possible ● Battery Working possible time : After Full charged battery about 8 hrs. ● Charging period : max. 16 hrs. (Automatically gets off when fully charged)											
Auto Power Off Function	10 Minutes (when AC Adapter is connected, continuous usage is possible), Invalidate/Cancel function is also possible.											
Memory Function	● Continuous Memory 1000 items/Independent Memory 100 items/ Standard Memory 50 items (3 types of Memory Mode switching over possible) ● Statistics function exists (Maximum, Minimum, Peak, Average, Standard deviation)											
Working Temperature (Temp.) Scope	Temperature : 0 ~ 40°C (However, no condensation allowed) Humidity : 35 ~ 85% RH (However, condensation not allowed)											
Outer Dimensions	W 75 × Thick 38 × L141mm				Width 75 × Thickness 38 × Length 147mm				L Only 149mm		W82 × T 57 × L 214mm	
Weight	About 450g											
Accessories	Measuring Adapter (6types), Hanger, AC Adapter, Carrying Case, USB Cable, Handle (FGPX- □ H Only)											
Communication Software	Exclusive Communication Software (Corresponding to USB) could be download free of cost from our Co.'s Home Page.											

Note : 1) R.C. = RATED CAPACITY Note : 2) digit = Digital Indication means 1 count part. ± 1 digit means that to the last digit the Digital Counter tolerance is 1 counter.

■ FGP Series

Model	FGP-0.2	FGP-0.5	FGP-1	FGP-2	FGP-5	FGP-10	FGP-20	FGP-50	FGP-100
Rated Capacity (RC)	± 2.000N(± 200.0g)	± 5.000N(± 500.0g)	± 10.00N(± 1000g)	± 20.00N(± 2.000kg)	± 50.00N(± 5.000kg)	± 100.0N(± 10.00kg)	± 200.0N(± 20.00kg)	± 500.0N(± 50.00kg)	± 1000N(± 100.0kg)
Display Possible Scope	± 2.000N(± 200.0g)	± 5.000N(± 500.0g)	± 10.00N(± 1000g)	± 20.00N(± 2.000kg)	± 50.00N(± 5.000kg)	± 100.0N(± 10.00kg)	± 200.0N(± 20.00kg)	± 500.0N(± 50.00kg)	± 1000N(± 100.0kg)
Display Resolution Power	0.001N/0.1g		0.01N/1g	0.01N/0.001kg			0.1N/0.01kg		1N/0.1kg
Unit	N, kg Unit Switchover (Reverse Indication possible)								
Measuring Method	Normal Measurement, Plus Peak, Minus Peak								
Display Interval	1 Rotation/Second, 2 Rotations/Second, 3 Rotations/Second, 5 Rotations/Second, 10 Rotations/Second, 20 Rotations/Second								
Sampling Interval	1000 Rotations/Second								
Accuracy	± 0.2% R.C. or ± 1/2 Digit (at 23°C)								
Display Numeric	Tag Attached 4 Digit Liquid Crystallized Display (Letter Height 12mm). The Tag is as against the Load Orientation and setting option is possible. Reverse Indication possible / 3 digit Liquid Crystallized Display (Letter Ht. 7mm)								
All Types Displays	(1) "LO BAT" (Battery Voltage Low) (2) "BAT" (while Recharging) (3) "OVR" (Over Load) (4) "PEAK" (Peak Hold Mode)								
Overload Weight Resistant	200% R.C.							150% R.C.	
Tracking Function	Exists (ON/OFF Switching Possible)								
Output Signal	(with exclusive communication software, communication with P.C. is possible. Connecting Cable is Standard Accessory). Continuous Transmitting Max. 100 Rev.s/Sec.								
USB	RS-232C, Analogue, Over Load, Comparator (FGP- □ Series Only), Analog Cable etc., Other Cables are Optional.								
Current	● AC Adapter (DC9V/200mA) or Inner Stored Nickle Hydrogen Battery (Rechargeable) ● During Recharging Measurements possible ● Battery Working possible time : After Full charged battery about 8 hrs. ● Charging period : max. 16 hrs. (Automatically gets off when fully charged)								
Auto Power Off Function	10 Minutes (when AC Adapter is connected, continuous usage is possible), Invalidate/Cancel function is also possible.								
Memory Function	● Continuous Memory 1000 items/Independent Memory 100 items/ Standard Memory 50 items (3 types of Memory Mode switching over possible) ● Statistics function exists (Maximum, Minimum, Peak, Average, Standard deviation)								
Comparator Function	Exists (Upper Limit and Lower Limit)								
Working Temperature (Temp.) Scope	Temperature : 0 ~ 40°C (However, no condensation allowed) Humidity : 35 ~ 85% RH (However, condensation not allowed)								
Outer Dimensions	W 75 × Thick 38 × L141mm			Width 75 × Thickness 38 × Length 147mm				L Only 149mm	
Weight	About 450g								
Accessories	Measuring Adapter (6types) ^{Note3} , Hanger, AC Adapter, Carrying Case, USB Cable,								
Communication Software	Torionon USB - Exclusive Communication Software (Corresponding to USB) could be download free of cost from our Co.'s Home Page.								

Note : 3) Measuring Adapter up to 0.5 - M4, Above 1 is M6 as accessories (Refer Page No.5)

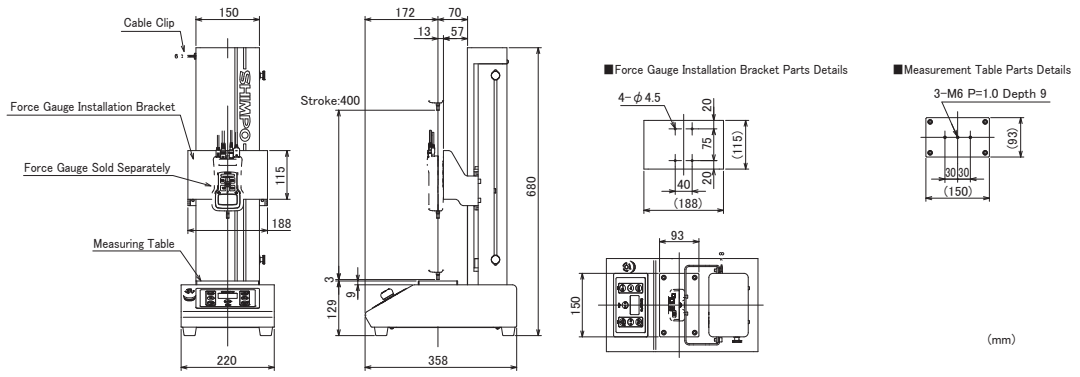
■ FGJN Series

TYPE	FGJN-2	FGJN-5	FGJN-20	FGJN-50
Rated Capacity(R.C.)	± 20.00N (± 2.000kg)	± 50.00N (± 5.000kg)	± 200.0N (± 20.00kg)	± 500.0N (± 50.00kg)
Display Possible Scope	± 20.00N (± 2.000kg)	± 50.00N (± 5.000kg)	± 200.0N (± 20.00kg)	± 500.0N (± 50.00kg)
Display Resolution Power	0.01N/0.001kg		0.1N/0.01kg	
Unit	Top-Bottom Reversible Indication is Possible.			
Measuring Method	Normal Measurement, Plus Peak Measurement, Minus Peak Measurement			
Display Period	1, 2, 3, 5, 10, 20 Revolutions/Second			
Sampling Period	1000 Revolutions/Second			
Accuracy	± 0.3%R.C and ± 1/2 (digit) (at 23°C)			
Temperature Effect	Gain : ± 0.03%/LOAD/°C , Zero : ± 0.02%/R.C/°C Zero Point Drift could be canceled by Tracking Function.			
Display Equipment	Numerical Value : Marked 4 Digit Liquid Crystal Indication (Mark could be set optionally, towards Load & Up-Down Reverse Display is possible.) Letter Ht.12mm Unit Display : 3 Digit Liquid Crystal Display. Letter Height 7mm All Types Displays : "LO-BAT" (Battery Voltage Low) "BAT" (During Charging) "OVR" (Over Load) "PEAK" (Peak Hold Mode)			
Overload Endurance Qty.	200% R.C			
Tracking Function	Yes. (ON/OFF Setting Possible)			
Power Supply	A.C. Adopter (DC9V/200mA) or Inner Stored in build Nickel hydro. Battery (rechargeable), during charging measurements could be taken. Battery Working Duration : After full charge, about 8 Hrs., Charging period max 12 hrs. (After full charge, automatically turns off)			
Auto Power Off Function	10 Minutes (When AC Adapter is connected, Continuous Usage is possible) or OFF			
Working Temperature Scope	0 ~ 40°C (However, condensation not allowed)			
Working Humidity Scope	35 ~ 85% RH (However, condensation not allowed)			
Outer Dimensions	Width : 75 x Thickness : 38 x Length 147 mm			
Weight	About 450 g			
Accessories	6 types of Adapters for measurement, Hanger, AC Adapter, Carrying-Case			

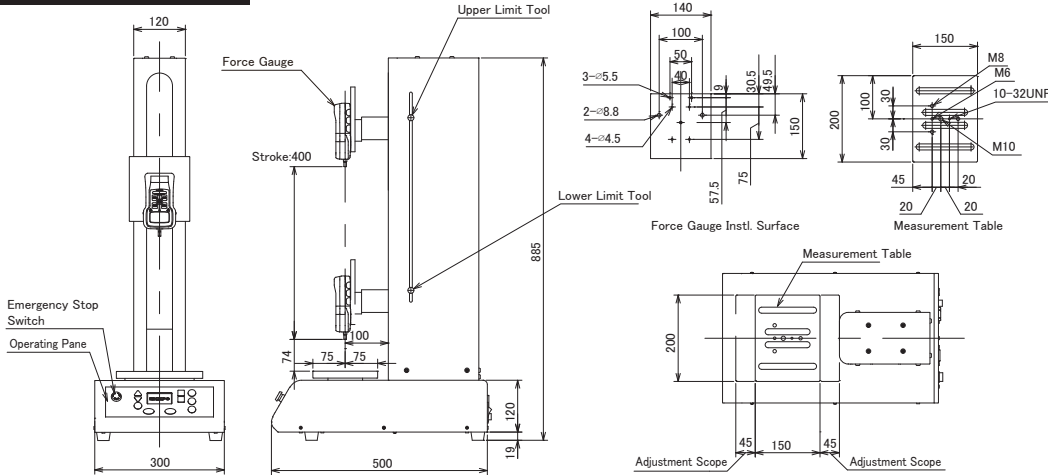
Note : 4) For Measuring Adapter up to 50 - M6, provided as accessories

Dimensional Drawing

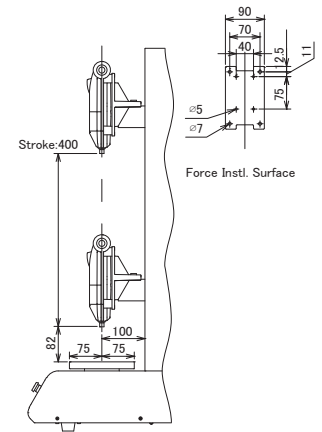
FGS-50E



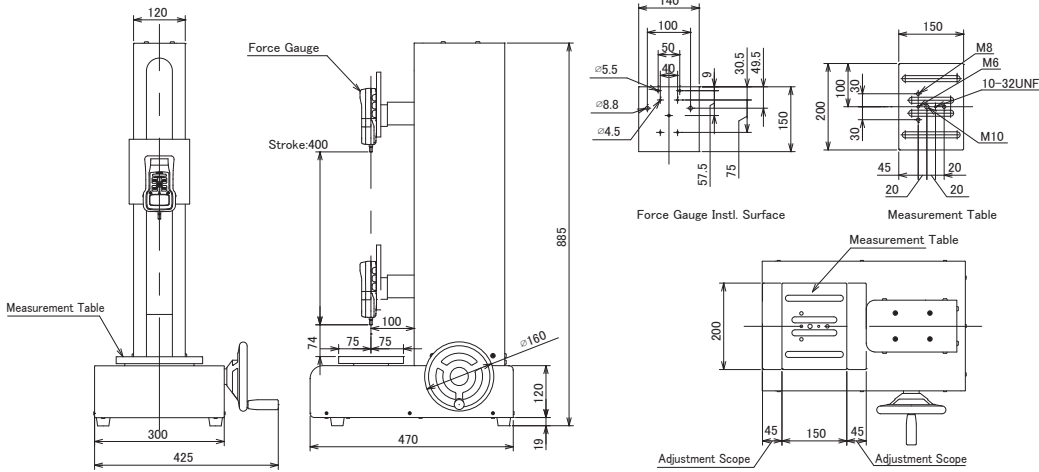
FGS-100VC



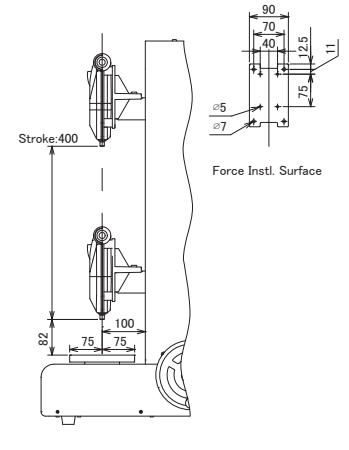
FGS-250VC



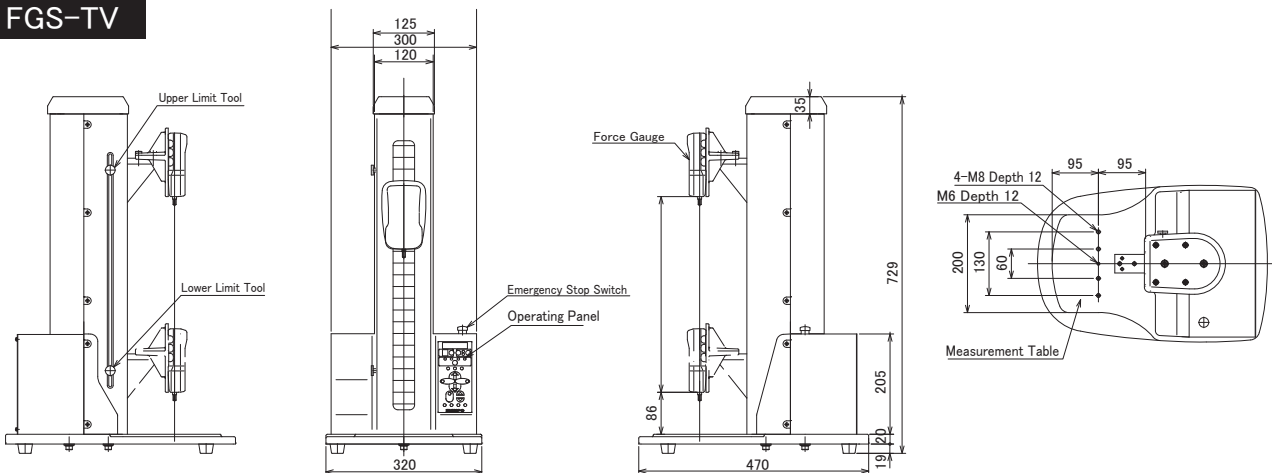
FGS-100HB



FGS-250HB



FGS-TV



■ FGS-50E Series

Model	FGS-50E-L		FGS-50E-H	
	Low Speed Specifications		High Speed Specifications	
Measurement Load	500N			
Endurance Load	500N			
Forwarding Speed	6 ~ 180mm/min		20 ~ 600mm/min	
Speed Setting	As per the Operation Panel, Speed to be set			
Stroke	400mm			
Display Parts	LCD 3 Digit Movement Speed, Action Mode Displayed			
Display	Movement Speed	6 ~ 180mm/min		20 ~ 600mm/min
	Action Mode	Manual (MANU), Small Movement (JOG), 1 Cycle (SIG), Both way Repetition (CON)		
Input	Over Load Input			
	Stop by FGXP(FGP) Over Load Signal			
Measurement Table	93 x 150mm			
Working Temperature Scope	0 ~ 45°C (No condensation is allowed)			
Current	AC100V ~ AC230V ± 10%			
Weight	About 20kg			
Outer Dimensions	220 x 680 x 358mm			
Accessories	● Connecting Cable 1 No. ● Power Supply Cable 1 No. ● Cable Clip 1 No. ● Socket Bolts (M4 x 8 for Force Gauge Installation 4 Nos., M6 x 12 for Jig Installation 2 Nos) ● Allen Key Spanner For M6 1 No., for M4 1 No.			

■ FGS- □ VC Series

Model	FGS-100VC		FGS-250VC	
	Measurement Load	1000N		2500N
Endurance Load	1000N		2500N	
Forwarding Speed	10 ~ 400mm/min			
Stroke	As per the Operation Panel, Speed to be set			
Display Parts	400mm			
Display	Movement Speed Display	Dot Matrix LCD Tag Attached 4 Digit		
	Movement Distance Display	10 ~ 400mm/min		
	Repeating Revolutions Display	Movement Speed Display		
Action Mode	0 ~ 9999			
Communication	MANU Mode : Movement towards Dog. / JOG Mode : Minor Operation. / Sing Mode : 1 Rotational Movement between Dog.			
	CONT Mode : Repeating Movement between Dog., / PROG Mode : 5 Point Position Movement			
Input	USB for P.C.			
Measurement Table	Stop by FGXP(FGP) Over Load Signal			
Working Temperature Scope	150 x 200mm			
Current	0 ~ 45°C (No condensation is allowed)			
Weight	About 63 kg.		About 65 kg.	
Accessories	AC100V ± 10%			
P.C. Software	For Force Gauge Power Supply AC Socket attached, For FGXP (FGP) Connecting Cable, USB Cable. FGT-VC : Exclusive Communication Software (Corresponding USB) Free Download from our Co.'s Home Page. When transmitting the data of load and distance, graph is displayed. (trigger function attached : after load set attaining, data feeding starts.) Continuous data feeding frequency setting is possible / upper-lower limit decision function attached.			
Other	Emergency Stop Switch			
Corresponding Force Gauge	FGP-0.2 ~ 50,100 / FGXP-0.2 ~ 50,100		FGP-0.2 ~ 50,100 / FGXP-0.2 ~ 50,100 / FGXP-250H	

■ FGS- □ HB Series

Model	FGS-100HB		FGS-250HB	
Measurement Load	1000N		2500N	
Endurance Load	1000N		2500N	
Stroke	400mm		400mm	
Handle 1 Rotation	About 1.33mm		About 0.55mm	
Measurement Table	150 x 200mm		150 x 200mm	
Weight	About 56kg		About 56kg	
Corresponding Force Gauge	FGJN-0.2 ~ 50 / FGP-0.2 ~ 50,100 / FGXP-0.2 ~ 50,100		FGJN-0.2 ~ 50 / FGP-0.2 ~ 50,100 / FGXP-0.2 ~ 50,100 / FGXP-250HB	

■ FGS- □ TV Series

Model	FGS-2TV	FGS-5TV	FGS-10TV	FGS-20TV	FGS-50TV	FGS-100TV	FGS-200TV	FGS-500TV	FGS-1000TV
Measurement Load	2N	5N	10N	20N	50N	100N	200N	500N	1000N
Endurance Load	1000N								
Forwarding Speed	1 ~ 700mm/min								
Stroke	400mm								
Operation	Through front face panel, setting, operation is possible								
	According to exclusive software "FGT-TV", setting . operation is possible								
Display	Movement Speed Displays	1 ~ 700mm/min							
	Movement Distance Display	0.0 ~ 400.0mm							
Data Feeding Intervals	Max. within 1 second, 100 items load and distance data feeding is possible								
Over Load Input	Stops with the FGP over-load signal.								
Communication	USB1.0								
Movement/Action	● AUTO MODE : Through P.C. Software already set all types of test action is performed. ● JOG MODE : Minor movement is possible. ● MANUAL MODE : Up to Limit dog position, movement is possible.								
Measurement Table	200 x 190mm								
Working Temperature Scope	0 ~ 45°C (No condensation is allowed)								
Current	AC100V ± 10% 2.5A								
Weight	35kg								
Accessories	USB Cable 1.8m								

* FGS- □ TV is the set of Digital Force Gauge (FGP) and Motor Stand, Measurement Software. Exclusive Jig is optional.

DTMX- □ C Series DTMB- □ C Series

Corresponds to High Level Measurement Environment

- | | |
|--|---|
| (1) SENSING ROLLER | (8) WIRE GUIDE |
| (2) LCD DISPLAY EQUIPMENT
Maximum. Minimum Value, PEAK Value,
Lights up whenever all indications battery
low. | (9) DIP SWITCH COVER (DIP SWITCH)
Memory Mode, Display Time,
Data Output, Wire Type Set. |
| (3) SLIDE-KNOB FOR GUIDE ROLLER
Use when the measuring wire is
pinched. (In place of Slido-knob for
guide roller, supporting lever can be
installed. | (10) CONNECTOR FOR AC ADAPTER
Connect the optional adapter. |
| (4) STORE SWITCH
Use at data memory. | (11) WIRE TYPE SWITCHING SWITCH
Matching with the Wire Type, Select
TEX (Thread), or WIRE (Steal,Copper). |
| (5) RECALL SWITCH
Used when Maximum. Minimum Value
Memory Data is to be recalled. | (12) FIELD ADJUSTMENT SWITCH
When indication value is increased
it executes correction. |
| (6) MEMORY DATA OUTPUT SWITCH
Data Output - when PC or Printer
is connected. | (13) POWER SUPPLY SWITCH
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	
	DTMX-0.2C	196.1cN
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) (DTMX- □ C Series)
- 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 copied-up.

TMT-DTM

Special software can be downloaded from our web page for free.

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

Differed Model General Use Tension PLS- □ K - □ - □ B Series

**Suitable for Controlling High Accuracy
Tension Inspection Equipment**



- Suitable Measuring Items :
 - Nylon Wire ▪ Piano Wire ▪ Copper Wire
 - Steel Wire ▪ Electrical Wire ▪ Thread
 - Stainless Wire ▪ Plastic Wire ▪ Flexible Wire
 - Communication Wire ▪ Metal, Needle Thread
- With +10V Rated Output, direct connection to controlling equipment is possible.
- Easy Installation for all types of equipments and machines.

PLS- □ K-2-12B : Width 124 x Height 120 x Thickness 47mm
 PLS- □ K-3-22B : Width 130 x Height 130 x Thickness 47mm

Model	Maximum Load	
	Force	Weight
PLS-0.2K-	1.961N	0.2kg
PLS-0.5K-	4.903N	0.5kg
PLS-1K-	9.807N	1kg
PLS-2K-	19.61N	2kg
PLS-5K-	49.03N	5kg
PLS-10K-	98.07N	10kg

Wire Speed (Max) *1 : 1000m/min
Input Current : DC12V(10.5 ~ 15.5V)0.45A
 As per specifications DC15V, DC24V is possible.

While calibrating, Sample Wire is necessary

Differed Model - For Tape, Film, Belt - Tension Meter PLS- □ K- □ - □ C Series

**Appropriate for Controlling High
Accuracy Tension Inspection**



- Appropriate Measuring Items :
 - Tape (paper, cloth, plastic wrap, magnetic)
 - Film (For VTR, condenser)
 - Non-threaded items
 - Metal Foils
- Roller Width Less than (10, 15, 20, 30mm),
 Thickness less than 0.2mm
- With +10V Rated Output, direct connection to controlling equipment is possible.

PLS- □ K-2- □ C : Width 124 x Height 120 x Thickness 47mm
 PLS- □ K-3- □ C : Width 130 x Height 130 x Thickness 47mm

Model	Maximum Load	
	Force	Weight
PLS-0.2K-	1.961N	0.2kg
PLS-0.5K-	4.903N	0.5kg
PLS-1K-	9.807N	1kg
PLS-2K-	19.61N	2kg
PLS-5K-	49.03N	5kg
PLS-10K-	98.07N	10kg

Wire Speed (Max) *1 : 300m/min
Input Current : DC12V(10.5 ~ 15.5V)0.45A
 As per specifications DC15V, DC24V is possible.

While calibrating, Sample Wire is necessary

Differed Model - For Ultra Low Measurement - Tension Meter PLS- □ G Series

**For MAX.9.81cN(10g) ~ MAX.49.03cN(50g)
For Ultra Low Tension Measurement Digital
Tension Meter**



Width 67 x Height 33 x Thickness 101mm

- Appropriate Measuring Items :
 - Metal Wires having less than $\varnothing 0.06\text{mm}$ *
 - Fiber of Textile etc.
- Low Tension measured with $\pm 2\%$ High Accuracy of Specified Tension.
- Measuring (150g), Compact Design.

* Textile Fiber, Metal Wire More than 0.06mm could be measured.
 However, results will be based on test Sample offered.

Model	Maximum Load	
	Force	Weight
PLS-10G	9.81cN	10g
PLS-20G	19.61cN	20kg
PLS-50G	49.03cN	50kg

Wire Speed (Max) *1 : 500m/min



◀ Display CSD-819C Attached.
 (Analog, Comparator Attached)

While calibrating, Sample Wire is necessary

For details refer to pages 17 ~ 18

Amp. Built-in Model Load Cell PLC Series



Width 97 x Height 99 x Thickness 42mm

- With +10V Rated Output, direct connection to Indicator or Program Groove Controller.
- Through Over Load Protection Equipment, over load endurance is double the specified load. (PLC-100K has triple the endurance load)
- Span, Zero, Tare adjustment attached.

Model	Maximum Load	
	Force	Weight
PLC-0.2KD	$\pm 1.961\text{N}$	$\pm 200\text{g}$
PLC-0.5KD	$\pm 4.903\text{N}$	$\pm 500\text{g}$
PLC-1KD	$\pm 9.807\text{N}$	$\pm 1\text{kg}$
PLC-2KD	$\pm 19.61\text{N}$	$\pm 2\text{kg}$
PLC-5KD	$\pm 49.03\text{N}$	$\pm 5\text{kg}$
PLC-10KD	$\pm 98.07\text{N}$	$\pm 10\text{kg}$
PLC-20KD	$\pm 196.1\text{N}$	$\pm 20\text{kg}$
PLC-50KD	$\pm 490.3\text{N}$	$\pm 50\text{kg}$
PLS-100KD	$\pm 980.7\text{N}$	$\pm 100\text{kg}$

Amp. Inner Stored Model Load Cell VLC Series



Width 95 x Height 70 x Thickness 40mm

- With +10V Rated Output, direct connection to Display Equipment or Program Groove Controller.
- Corresponding to very small space, Assembly or differed, Hanging etc. - Compact Design.
- Span, Zero, Tare adjustment attached.
- Easy Connection.

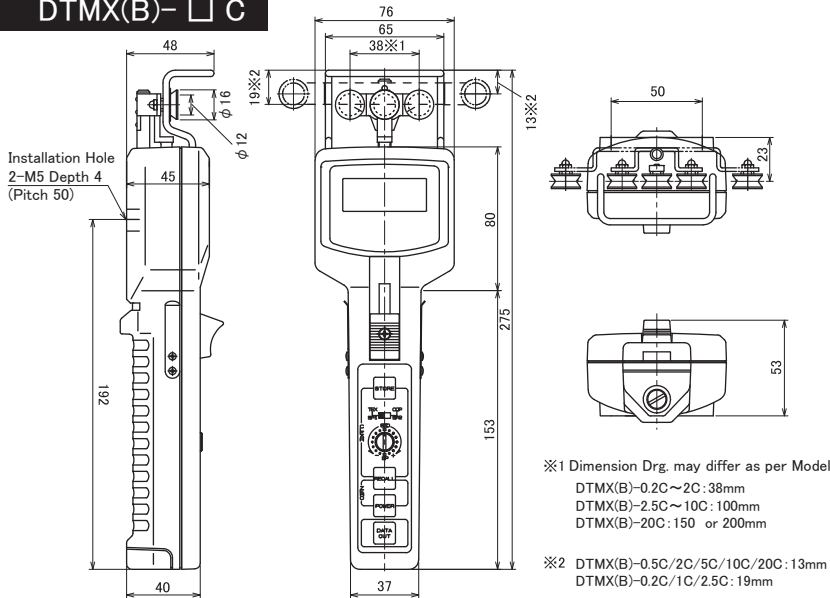
Model	Maximum Load	
	Force	Weight
VLC-200K	$\pm 2\text{kN}$	$\pm 203.9\text{kg}$
VLC-500K	$\pm 5\text{kN}$	$\pm 509.9\text{kg}$
VLC-1000K	$\pm 10\text{kN}$	$\pm 1020\text{kg}$

Input Current : DC12V(10.5 ~ 15.5V)0.15A
 As per specifications DC5V, DC24V is possible.

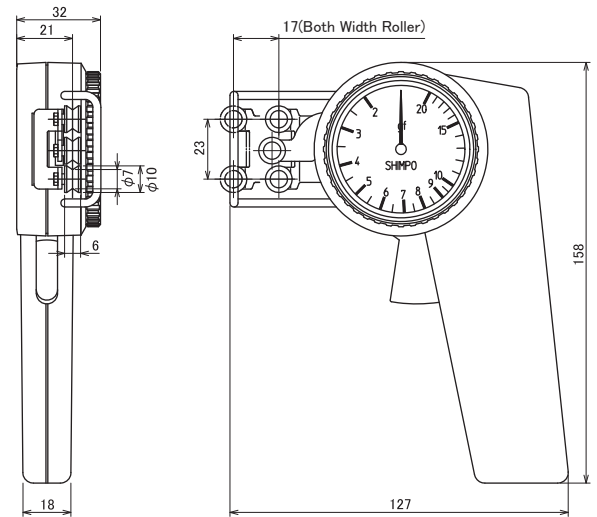
*1 Roller Wearing or measuring wire effect (winding etc.), no guarantee for accuracy.

Dimensional Drawing

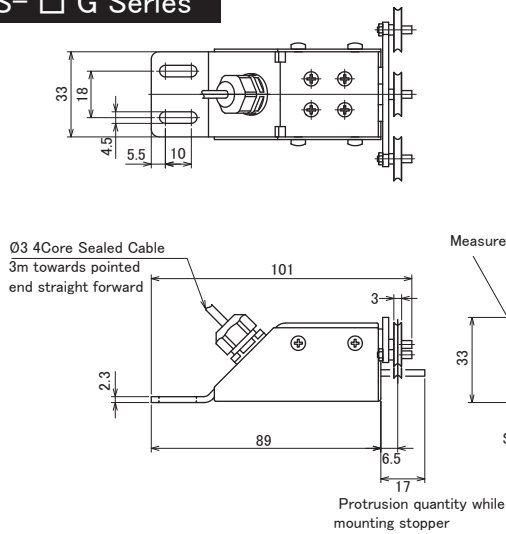
DTMX(B)- □ C



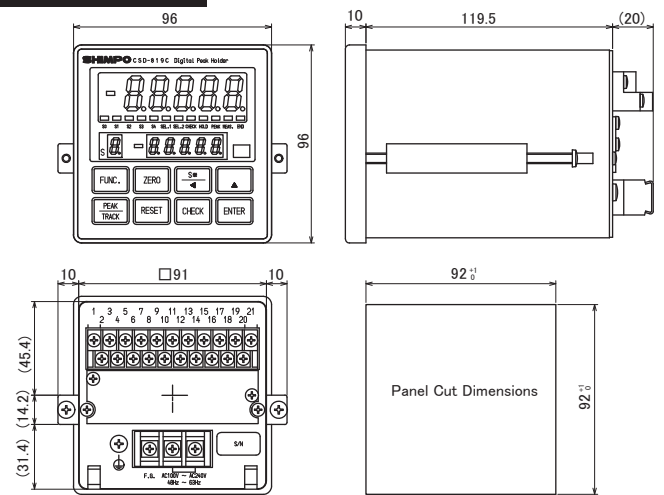
ZF2 Series



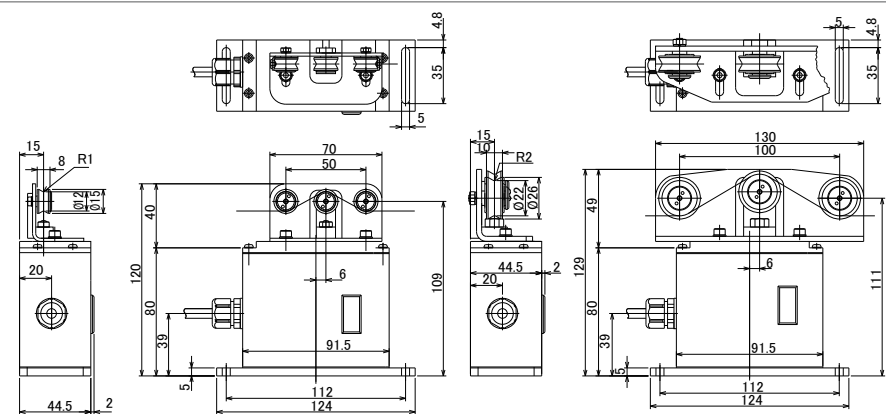
PLS- □ G Series



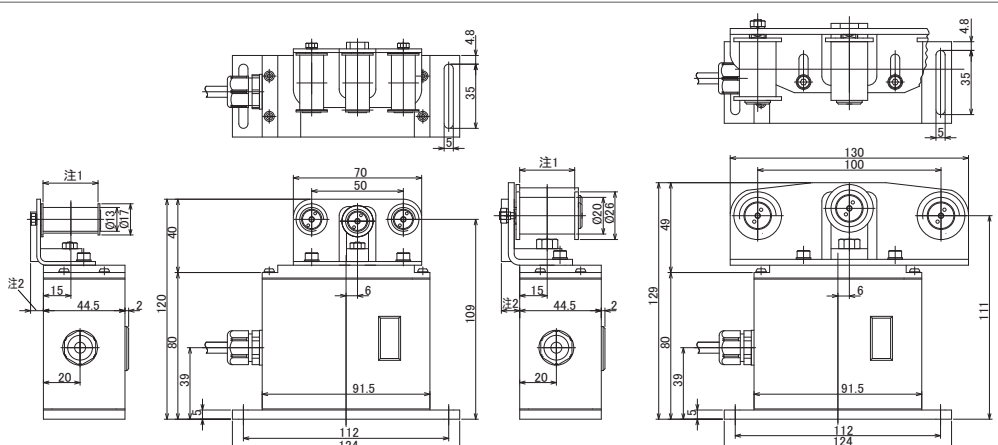
CSD-819C



PLS- □ K- □ - □ B Series



PLS- □ K- □ - □ C Series



■ 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.) ^{Note1}		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 <0.15	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 ^{Note5}							
	DTMB- □ C	Final Measurement Value, Max. Value, Min. Value, PEAK Value							
Maximum Speed ^{Note4}		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 ^{Note5}	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) : $\sqrt{\sum (Xi-\bar{x})^2/n}$

■ 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 ^{Note1}		
Allowable Over Load	± 200% /R.C. ± 2% /R.O ^{Note2}		
Wire Speed (Max.) ^{Note3}	500m/min		
Roller Shape	φ 15mm "V" Groove Ceramic Roller		
Environment Endurance	Liberation Model (Sensor Parts, Bearing Parts) ^{Note 4}		
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 ^{Note1}	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) ^{Note 2}	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) ^{Note 3}	± 1% /R.O.					
Rated Output ^{Note 4}	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 (1kg)	19.61N (2kg)	49.03N (5kg)	98.07N (10kg)
Measurement Item	< 10, 15, 20, 30mm, Thickness < 0.2mm					
Wire Speed (MAX) ^{Note 2}	300m/min ^{Note 1}					
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) ^{Note 3}	± 1% /R.O.					
Rated Output ^{Note 4}	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 ^{Note} (Switch Over possible for 10, 100, 1000Hz)		
A/D Sampling	2000 Rev./Sec. ^{Note}		
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 ~ 50cC, <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)



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