FORCE MEASUREMENT

IMADA

Product Catalog

Torque and Food Testers

TORQUE GAUGES
TEXTURE ANALYZER

2016-12

IMADA's force testers are used worldwide in R&D and quality control of every industry to assess and ensure the quality.

IMADA offers a wide range of force testing products and know-how accumulated for many decades, enabling you to measure a huge variety of "force" such as mechanical strength (breaking/deformation force), tactile sensation (softness/hardness), functionality of operational physical force, and more.

▌Torque Testers

IMADA's torque testers can be used for measuring various torque such as twisting, turning, etc.
We offer a wide range of torque testing products such as test stands for higher repeatability, torque-angle testers, and more to fit your measurement needs.

▌Testers for Food Industries

IMADA'S food texture analyzer can be used for analyzing food texture (firmness, elastic force, and more).
We offer a wide variety of food testers and jigs to meet your measurement needs.
Some of our testers can perform tests according to standards.

FORCE MEASUREMENT

IMADA

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The further information is on our website.

http://www.forcegauge.net/

You can see our website on your tablet.

●The contents will be changed without any notices.
●We can custom design and manufacture to meet your particular requirements.
●Please feel free to contact us or our distributor for further information of our products.
●The colors and shapes might be slightly different from the actuel products.
●We show specifications partially,so please see full specifications on our website or contact us before purchase.

Agency

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Turning / Twisting Force Testing

Torque Gauges

Bottle cap torque tester	P03
Handheld torque testers	P05
Torque meter for motor screw drivers and torque drivers	P06
Sensor interchangeable amplifiers	P07
Software for graph drawing	P08
Motorized torque test stands providing high repeatability due to automatic operation	P10
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Food firmness testing

Texture Analyzer

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Utilize this index to find the number of the page of your desired product.

IMADA gauges can be used for a wide range of force testing applications.

IMADA force gauges have been used worldwide for more than 65 years to assess and ensure quality by professionals in every industries. We provide the best solutions from simple testing to professional testing.

For further information, please see another catalog "Catalog for Force Gauges and Associated Equipment" or our web page.

Compression Force Testing

Switch activation force testing

Cushion/pillow repulsion testing

Crushing strength testing

Tension Force Testing

Bottle cap pull-off testing

Film breaking force testing

Cork pull-off force testing

Peeling / Adhesion Force Testing

Packaging opening force testing

Corrugated cardboard adhesion testing

Film peel testing

Coefficient of Friction

Film coefficient of friction testing

Floor coefficient of friction testing

Grip coefficient of friction testing

FORCE MEASUREMENT
IMADA

65 Years History of IMADA Force Gauge

In 1947
Developed the first force gauge in Japan.

The Latest Force Gauge
Capable, Functional and User-friendly force gauge, ZT series is released.

PS (1959)
PS (1965)
PS (1972)
PS (1979)
PS/FB/PSM (1993)

DPS-S (1987)
SS II (1989)
DPSS-T/DPSS (1995)
DPS (1996)
DS2 (2006)

PS
DPS (1984)
DPRS-T (1988)
DPRSX-T (1994)
DPX-T/DPX (1997)
DPZ (2002)
ZP/Z2 (2004)
ZTA/ZTS

Torque Testers

Testers for Food Industries
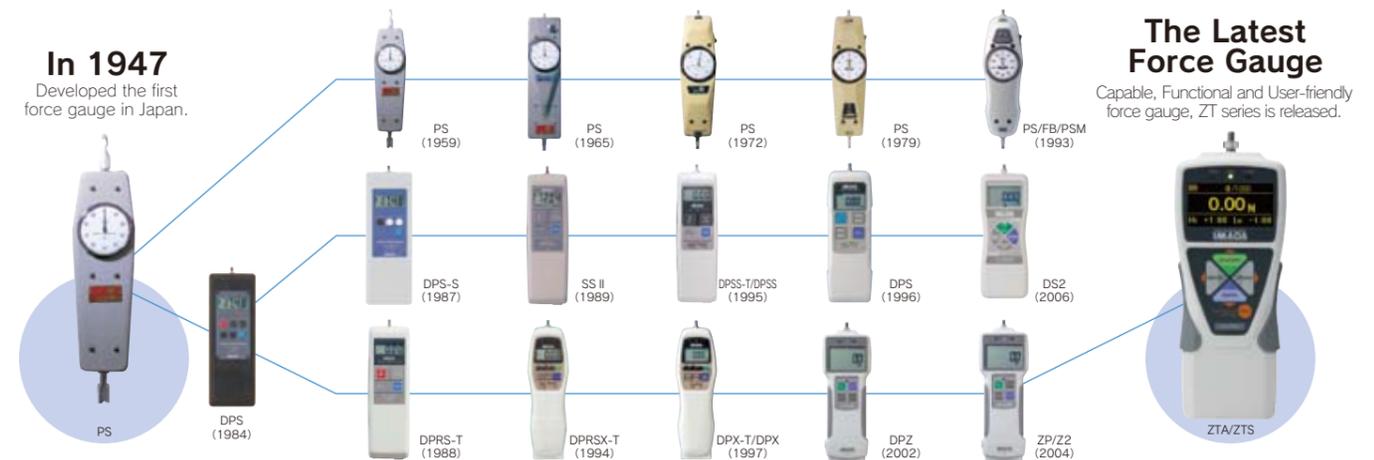
Torque Gauges

Torque Gauge Measuring Rotating/Twisting Force

"Torque" is the tendcncy of a force to rotate an object around an axis, fulcrum, or pivot. The Unit of torque is N-m/N-cm, Kgf-m/Kgf-cm, or Ibf-in/ozf-in.
IMADA torque gauges enable you to measure torque easily and accuratcly.

Screw Cap Torque Tester

DTXS/DTXA series

Accurately / Precisely
◎It captures torque values accurately due to its high sampling rate (2000Hz).
◎It is designed to reduce weight influence by its bearing mechanism for greater accuracy.

User friendly
◎High Luminance Organic EL display
Clear organic display has excellent readability.
◎8 languages available
Setting menu in 8 languages helps easy operation.

Program Menu
High Low Setpoints
Peak Functions
Internal Memory
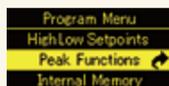
Making efficient
◎High working efficiency due to manual operation
◎You can easily capture peak value using peak hold function.
◎You can pick out defective products easily using OK/NG judgement function.

DTXA
High-functional type
DTXA series include all the functions of DTXS series, with a few additional features below.

Inputting/Outputting Angle
◎HTGA indicates both torque and angle on its monitor, combined with an angle meter.
Torque-Angle Analysis with HTGA Go to page 11

Easy data management on PC
◎Data capturing software ZT-Logger is included
－It sends 10 data/sec
－It automatically detects maximum and minimum values.
－It saves data in CSV format.
◎Graphing by optional force capturing software
The software shows torque vs time graphically on PC in real time (at Max. 2000Hz)
Go to page 08 for further information.

▲ Torque capturing software ZT-Logger(Included)

▲ Torque graphing Software Force Recorder (Separately sold)

DTXS
Standard Type
□Size：Approx.W233×D305×H87mm (withiout the table and the pins.)
□Weight：Approx.4.5kg (including Standard table and 4 pc Standard pins.)

Capturing 2 Peaks
◎You can capture 1st and 2nd peaks of measurement.

Saving Data to USB Flash Drive
◎You can save continuous data into USB flash drive at 100Hz.
In other words, you can save data even without PC.

Check Torque Transition on Graphs
Software Force Recorder ———— To page 08

Print the Results
Printer DP-1VR ———— To page 09
＋ Cable CB-308 ———— To page 09

Improve Measuring Repeatability
Motorized Torque Test Stand —— To page 10

Analyze the Relation of Torque and Angle
Torque-Angle Analysis Unit TAA series — To page 11

Accuracy	±0.5%F.S.±1digit
Unit of measurement	N-m, N-cm, kgf-m, kgf-cm, lbf-in, ozf-in(switchable)(※1)
Display	4-digit Organic EL
Sampling rate	2000 data / sec at maximum
Function	Customized display (header and footer), Peak hold (clockwise and counter-clockwise), Internal 1000 points data memory, Comparator (judgment of OK or NG), Reversible display, Sign inversion, Zero clear timer, +NG alarm, Off timer (auto power off), Dumping,Time display 1st/2nd peak(only for DTXA), Angle detection at torque peak value(only for DTXA)(※2),Angle zero reset at selected torque(only for DTXA)(※2)
Output	USB, RS232C, Mitutoyo digimatic (※3), 2 VDC analog output (D/A),Comparator 3 steps (-NG/OK/+NG), Overload alarm Sub comparator 2 steps (output of large or small judgment)(only for DTXA), USB flash drive(only for DTXA), Angle(displacement)(only for DTXA) (※2)
Accessory	CD driver (including simple software for data logging), USB cable, AC adapter, Carying case, Instruction manual, Inspection certificate,L wrench, Handles (10N-m range only) USB flash drive adapter(only for DTXA)(※4)

Model	Capacity	Display
DTXS-2N	2 N-m (200N-cm)	2.000N-m (200.0N-cm)
DTXS-5N	5 N-m (500N-cm)	5.000N-m (500.0N-cm)
DTXS-10N	10N-m (1000N-cm)	10.00N-m (1000N-cm)
DTXA-2N	2 N-m (200N-cm)	2.000N-m (200.0N-cm)
DTXA-5N	5 N-m (500N-cm)	5.000N-m (500.0N-cm)
DTXA-10N	10N-m (1000N-cm)	10.00N-m (1000N-cm)

The above-mentioned model comes with a standard table and standard pins.
We provide it without the table and the pins, or one with a smaller table.
The model without any tables: DTXS-○○N-Z or DTXA-○○N-A
The model with a smaller table: DTXS-○○-N-ST or DTXA-○○N-ST

※1 These are the specifications for International model. Please note that this unit is different from Japanese domestic model.
※2 Angle(displacement) scale is necessary to valid this function. ※3 Not always available for Mitutoyo digimatic products.
※4 USB flash drive is not included.

This product is in accordance with a part of JIS S 0022(2001)

03

DTXS/DTXA series can handle opening/closing torque tests of various containers' caps.

PET bottles   Medicine jars   Eye drop bottles

Cosmetics containers   Lipstick containers   Rotary switches

How to Measure
Set a table. → Put pins in holes with consideration for sample's size. → Turn the handle to fix the sample. → Turn its cap by hand.
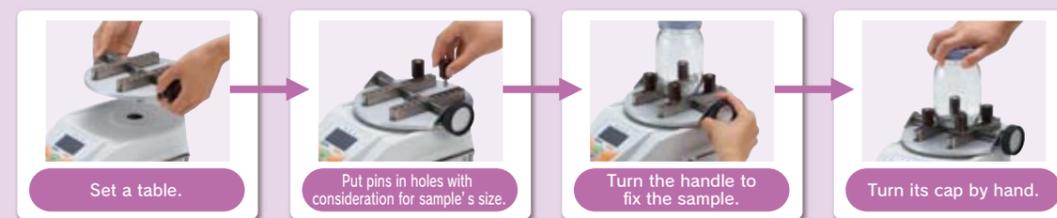
Attachments for Torque Testers

Attachments for DTXS/DTXA

We provide several kinds of interchangeable tables to fit your test samples.
※You can purchase pins only without tables. Please see our web page for further information.

Standard table and Standard pins
(DTXS/DTXA-○○N when combining with DTXS/DTXA body.※1)
This table grips PET bottles, aluminium cans, glass jars and the like whose diameters are φ20～160mm
Model：**DT-TB**
Capacity：10N-m
Allowable sample diameter：φ20～160mm

Standard table and Notch pins
(DTXS/DTXA-○○N-ST-01 when combining with DTXS/DTXA body.※1)
Ideal for slippery samples such as aluminum cans.
Model：**DT-TB-01**
Capacity：10N-m
Allowable sample diameter：φ20～160mm

Standard table and Long clamp pins
(DTXS/DTXA-○○N-ST-02 when combining with DTXS/DTXA body.※1)
Ideal for tall samples such as 2 liter PET bottles.
Model：**DT-TB-02**
Capacity：10N-m
Allowable sample diameter：φ20～160mm

Small table and Standard pins
(DTXS/DTXA-○N-ST when combining with DTXS/DTXA body.※1)
Ideal for measuring torque of small samples such as eye drop bottles.
Model：**DT-ST**
Capacity：5N-m
Allowable sample diameter：φ7～50mm

Small table and Notch pins
(DTXS/DTXA-○N-ST-01 when combining with DTXS/DTXA body.※1)
Ideal for gripping samples such as resin connectors and the like.
Model：**DT-ST-01**
Capacity：5N-m
Allowable sample diameter：φ7～50mm

Small table and Long clamp pins
(DTXS/DTXA-○N-ST-02 when combining with DTXS/DTXA body.※1)
Ideal for small and tall samples such as cosmetic bottles.
Model：**DT-ST-02**
Capacity：5N-m
Allowable sample diameter：φ7～50mm

Pin chuck
Ideal for gripping columnar samples.
Large φ1.2～13mm　Model：**DT-DC-13**
Medium φ0.5～6.5mm　Model：**DT-DC-6.5**
Medium Stainless Steel
φ0.5～6.5mm　Model：**DT-DC-6.5SUS**※2
Small φ0.5～4mm　Model：**DT-DC-4**

Sample stage
This stage helps you put a sample stably
Model：**TB-SP**
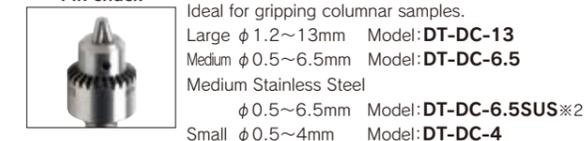
※1 Please choose ○○N from 2N,5N or 10N and □N from 2N or 5N.　　※2 We recommend to use Stainless steel type under easy-to-rust environment.

04

HTGS/HTGA series

Accurately / Precisely

◎It captures torque values accurately due to high sampling rate (2000Hz).
◎ HTGS and HTGA are designed to reduce the influence by its bearing mechanism, achieving greater accuracy. (Torque measurement is influenced by bending/compression/tension force during measurement, decreasing accuracy.)

User friendly

◎High Luminance Organic EL display
Clear organic display has excellent readability.
◎8 languages available
Setting menu in 8 languages helps easy operation.

Making efficient

◎OK/NG judgement
You can pick out defective products easily.
(+NG or –NG light goes on when the torque is over or under the borderline that you decide.)
◎3 line indicator
A torque value is indicated in the middle tier, and you can select information as required in the upper and lower tiers.
◎The available information is such as time / the number of memory / set points etc.
◎Connecting to / interlock external equipment

Varieties of Torque Can Be Measured

◎HTGS/HTGA can handle a wide range of torque testing applications using different attachments.
Go to page 06 for further information.

Easy data management on PC

◎Data capturing software ZT-Logger is included
 −It sends 10 data/sec
 −It automatically detects maximum and minimum values.
 −It saves data in CSV format.
◎Graphing by optional force capturing software
The software shows torque vs time graphically on PC in real time (at Max. 2000Hz)
Go to page 08 for further information.

▲ Torque capturing software ZT-Logger(Included)
▲ Torque graphing Software Force Recorder (Separately sold)
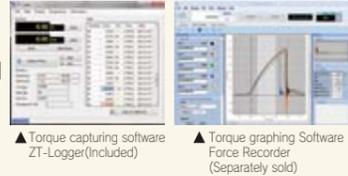
HTGS
Standard Type

□Size(The indicator only) : Approx.W75XD34XH188mm
□Weight(The indicator only) : Approx.490g
※This product is NOT including the attachment on the top of the gauge.

HTGA
High functional type

HTGA series include all the functions of HTGS series, with a few additional features below.

Inputting/Outputting Angle

◎HTGA indicates both torque and angle on its monitor, combined with an angle meter.
Torque-Angle Analysis with HTGA – Go to page 12

Capturing 2 Peaks

◎You can capture 1st and 2nd peaks of measurement.

Saving Data to USB Flash Drive

◎You can save continuous data into USB flash drive at 100Hz.
In other words, you can save data even without PC.

Check Torque Transition on Graphs
Software Force Recorder ———— **To page 08**

Analyze the Relation of Torque and Angle
Torque-Angle Analysis Unit TAA series – **To page 11**

Print the Results
Printer DP-1VR ———————— **To page 09**
＋Cable CB-308 ——————— **To page 09**

Accuracy	±0.5%F.S.±1digit
Unit of measurement	N-m, N-cm, kgf-m, kgf-cm, lbf-in, ozf-in(Switchable)(※1)
Display	4-digit Organic EL
Sampling rate	2000 data / sec at maximum
Function	Customized display (header and footer), Peak hold (clockwise and counter-clockwise), Internal 1000 points data memory, Comparator (judgment of OK or NG), Reversible display, Sign inversion, Zero clear timer, +NG alarm, Off timer (auto power off), Dumping,Time display 1st/2nd peak(only for HTGA), Angle detection at torque peak value(Only for HTGA)(※2),Angle zero reset at selected torque(only for HTGA)(※2)
Output	USB, RS232C, Mitutoyo digimatic (※3), 2 VDC analog output (D/A),Comparator 3 steps (-NG/OK/+NG), Overload alarm Sub comparator 2 steps (output of large or small judgment) (only for HTGA), USB flash drive(only for HTGA), Angle(displacement)(only for HTGA) (※2)
Accessory	CD driver (including simple software for data logging), USB cable, AC adapter, Carrying case, Instruction manual, Inspection certificate, L wrench, Handles (10N-m range only) USB flash drive adapter(only for HTGA)(※4)

| Model	Capacity	Display
HTGS-0.5N	50N-cm	50.00N-cm
HTGS-2N	2N-m(200N-cm)	2.000N-m(200.0N-cm)
HTGS-5N	5N-m(500N-cm)	5.000N-m(500.0N-cm)
HTGS-10N	10N-m(1000N-cm)	10.00N-m(1000N-cm)
HTGA-0.5N	50N-cm	50.00N-cm
HTGA-2N	2N-m(200N-cm)	2.000N-m(200.0N-cm)
HTGA-5N	5N-m(500N-cm)	5.000N-m(500.0N-cm)
HTGA-10N	10N-m(1000N-cm)	10.00N-m(1000N-cm)

※1 These are the specifications for International model. Please note that this unit is different from Japanese domestic model.
※2 Angle(displacement) scale is necessary to valid this function.
※3 Not always available for Mitutoyo digimatic products.
※4 USB flash drive is not included.
※No attachments are included.

We provide a wide range of interchangeable attachments to handle a huge range of torque testing.

Lid of plastic container   Door knob
Rotary switch   Screws   Keys

How to Measure

Mount an attachment.   Fix a sample.   Turn the sensor to measure torque.
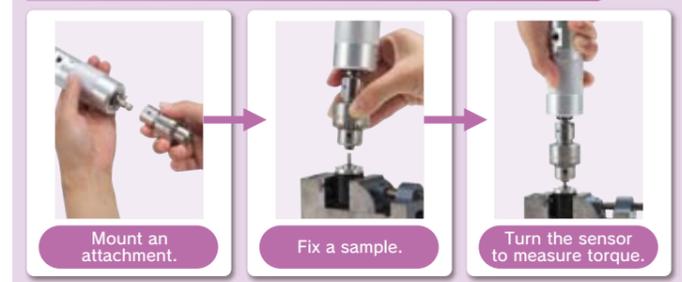
Attachments for Torque Testers

Attachments for HTGS/HTGA
We provide a wide range of interchangeable attachments to fit various testing needs.

Pin chuck
Ideal for gripping columnar samples.

Large pin chuck
Model:**HT-DC-13**
Opening width: φ1.2～13mm
Weight:approx.600g
※Cannot be used for 2N-m or 0.5N-m range

Standard pin chuck
Model:**HT-DC-6.5**
Opening width: φ0.5～6.5mm
Weight:approx.200g
※Cannot be used for 0.5N-m range

Model:**HT-DC-6.5SUS**
Opening width: φ0.5～6.5mm
Weight:approx.190g
※Cannot be used for 0.5N-m range

Small pin chuck
Model:**HT-DC-4**
Opening width: φ0.5～4mm
Weight:approx.100g

※HT-DC-6.5SUS (Stainless model) is recommended under easy-to-rust environment.

Socket holder
Ideal for torque wrench or screwdriverbit.
Model:**HT-9.5SQ**
Socket:9.5mm square
Weight:approx. 100g

Torque driver
Ideal for measureing tightening / loosing torque.
Model:**HT-DBH**
Bit:+:No.1×50
 +:No.2×50
 -:No.3×50
Weight:approx. 100g

M10 adaptor
This adaptor is Used to mount M10 attachment.
Model:**HT-AD-M10**
Screw:M10×L20
Weight:approx. 50g

Sensor holder
The holder is used to fix sensor.
Model:**SHT-5N**
Capacity: 5N-m

Small table and Standard pins
Designed for small samples.
Model:**HT-ST**
Capacity:5N-m
Allowable sample diameter: φ7～50mm
※Can not be used for 0.5N-m range

Small table and Notch pins
Ideal for gripping samples such as resin connectors and the like.
Model:**HT-ST-01**
Capacity:5N-m
Allowable sample diameter: φ7～50mm
※Can not be used for 0.5N-m range

Small table and Long clamp pins
Ideal for measuring torque of doorknobs, electric bulbs and so on.
Model:**HT-ST-02**
Capacity:5N-m
Allowable sample diameter: φ7～50mm
※Can not be used for 0.5N-m range

Torque Meter for Motor Screw Drivers and Torque Drivers

I-8/I-80

You can easily measure torque of a motor screw driver and torque driver. It is ideal for daily torque maintenance.

Model		I-8	I-80
Measuring range※1		0.20～78.60 cN-m	0.020～7.860 N-m
		0.020～8.000 kgf-cm	0.20～80.00 kgf-cm
		0.020～6.970 lbf-in	0.20～69.70 lbf-in
			2.0～786.0 cN-m
Accuracy		+/- 0.5% (reading value) or +/-3digit in less than 499 digit.	
Display		4 digits LCD display	
Measuring direction		CW-CCW (Right turn /Left turn)	
Measuring mode		P-P(Peak-hold), T-R(Track), P-D(Peak-down),C(real time data output)	
Real-time output		Output torque at every 1/180 seconds	
Data output		ASCII (baud rate 19200)	
Functions		Upper/ Lower value setting, Pass-fail decision, Internal memory, Auto zero reset function, Auto power-off (in 10 minutes with no operation), Max./ Min./Ave. display, Zero Reset function	
Battery		Ni-Cd 1.2v×5 cell(700mAh) 300 times	
Charging time/Usable time		Approx.3 hours/ Approx. 12 hours continuous use after full charge.	
Socket joint part (Detecting parts shape)		Square 20 mm / Square 9.5 mm	
Included items (1 each)		Driver adapter OW-025/OW-10 Driver adapter OW-20/OW-60	
		Attache case, battery charger, inspection certificate, calibration certification, traceability system diagram.	

※This product is NOT suitable for impact tools testing.

	OW-025	OW-10	OW-20	OW-60
Range	Max. 0.25N-m	Max. 1.0N-m	Max. 2.0N-m	Max. 6.0N-m
Mechanical life	10,000 times	8,000 times	5,000 times	5,000 times
Bit joint part	M2.6+Pan head screw	M3.0+Pan head screw	M4.0+Pan head screw	M6.0+Panhead screw
Body dimension	φ28×44	φ32×51	φ32×51	φ32×69

eZ-Connect series

[This is recommended in these cases below.]

| Measure things from low load to high load. | Carry out different types of tests such as tension and torque. | Keep a spare load sensor to reduce risks in operation. |

Sensor Interchangeable Amplifier eZT

Precise
◎You can capture test data precisely due to its high sampling rate (Max.2000Hz).

Easy
◎No additional adjustment is needed to replace load cells.

Multifunctional
◎It has many useful functions such as OK/NG judgement, saving data in USB flash drive, and more.

☐Size (Amplifier only) : Approx.W75×D34×H188mm
☐Weight (Amplifier only) : Approx.490g

Check Force / Torque Transition on Graphs
Software Force Recorder ——— To Page 08

Print The Results
Printer DP-1VR ——— To Page 09
+Cable CB-308 ——— To Page 09

Connect with External Devices
Cable Using Applications ——— To Page 09

eZ-Connect series are…

◎**eZ-Connect is composed of an amplifier and load cells. You can replace load cells without additional adjustment.**
·Its overall accuracy is calculated as the total of the accuracy of the amplifier (+/- 0.2%F.S.) and a load cell connected with it.
·The amplifier is not calibrated with any load cells, and we do not offer inspection certificate when we ship it out. Therefore, please calibrate it by yourself, or request calibration for each combination if needed (available at a charge).

■eZT Specifications

Model	eZT
Accuracy	+/-0.2%F.S. (※1)
Unit of measurement	Depends on load cell and settings *(N,kN,kgf,lbf N-m,N-cm,kgf-m,kgf-cm,lbf-in,ozf-in)
Display	4-digit
Display update	16 / sec
Sampling rate	2000 data / sec at maximum (※2)
Functions	Customized display (header and footer), Peak hold (tension and compression), Internal 1000 points data memory,Comparator (judgment of OK or NG), Reversible display, Sign inversion, Zero clear timer, +NG alarm,Off timer (auto power off), Dumping, Time display, 1st/2nd peak,Displacement detection at force peak value,Displacement zero reset at selected force, setting lock
Output	USB, RS232C, Mitutoyo digimatic (※3), 2 VDC analog output (D/A),Comparator 3 steps (-NG/OK/+NG),Overload alarm, Sub comparator 2 steps (output of large or small judgment), USB flash drive, Displacement.
Operating environment	Temperature: 0 to +40 degree Celsius, Humidity: 20 to 80%RH
Battery	8 hours (2 hours charge) (※4)
Accesoories	AC adapter, CD driver (including simple software for data logging), USB cable, Operation manual, Carrying case, Adaptor for USB flash drive (※5)

※Japanese domestic model does not indicate kgf (kgf-m, kgf-cm) and lbf (lbf-in, ozf-in).
※1 The accuracy of load cell is added when using connected with a load cell.
※2 You can save up to 100 data/sec. in USB flash drive (selectable among 1, 50, and 100 /sec)
※3 You cannot use it with Mitutoyo digimatic products in some cases.
※4 The battery is more consumed when connected to USB flash drive or a linear scale.
※5 USB flash drive is not included.
◎If you would like to use this amplifier combined with a test stand, please contact us or our sales partner.

Models of load cells for eZ-Connect series

◎**Add "e" to model name of a load cell for eZ-Connect series as stated below.**

Example Normal load cell: DPU-50N

Load cell for eZ Connect series:eDPU-50N

For Torque (only for eZ-connect)

Torque Load Cell eHT series

It measures turning/twisting force.

It measures torque using optional attachments such as pin chuck, socket holder, torque driver etc.(Page 08)

Capacity	0.5N-m～10N-m
Accuracy	±0.5% F.S. or less
Size	φ38×138mm
Cable length	Approx.0.5～1m (curl cable)

Model	Capacity
eHT-0.5N	50N-cm(※)
eHT-2N	2N-m(200N-cm)
eHT-5N	5N-m(500N-cm)
eHT-10N	10N-m(1000N-cm)

※Displayed unit is "N-cm" only.

for Compression and Tension (only for eZ-connect)

Standard Type eDPU

Easy built-in shape to external equipment

It measures force by mounting an attachment on the thread (the male screw part).

Capacity	2N～500N
Accuracy	±0.2%F.S. or less
Size	Approx.W58×D21×H71～W72×D21×H73mm
Cable Length	Approx.2m

Model	Capacity	Thread
eDPU-2N	2N	
eDPU-5N	5N	
eDPU-10N	10N	
eDPU-20N	20N	Male Screw M6P1.0
eDPU-50N	50N	
eDPU-100N	100N	
eDPU-200N	200N	
eDPU-500N	500N	

for Compression (only for eZ-connect)

Small Type eLM

It can be inserted in narrow spaces due to the coin shape.

It measures force by applying compression on the top of projection.

Capacity	10N～20kN
Accuracy	10N~10kN:±2.0%F.S. or less 20kN:±3.5%F.S. or less
Size	Approx.φ12XH4～φ21XH10mm
Cable Length	10N~2000N:Approx.2m 5000N~20kN:Approx.3m

Model	Capacity
eLM-10N	10N
eLM-20N	20N
eLM-50N	50N
eLM-100N	100N
eLM-200N	200N
eLM-500N	500N
eLM-1000N	1000N
eLM-2000N	2000N
eLM-5000N	5000N
eLM-10kN	10kN
eLM-20kN	20kN

◎You can combine it with various load cells.
Please see "Force Gauges & Associated Equipment catalog" for the details of load cells available.

Data Analysis Software Force Recorder series

Analyze data easily and accurately, and create report with ease

■Make efficient by simple manipulations and useful functions.
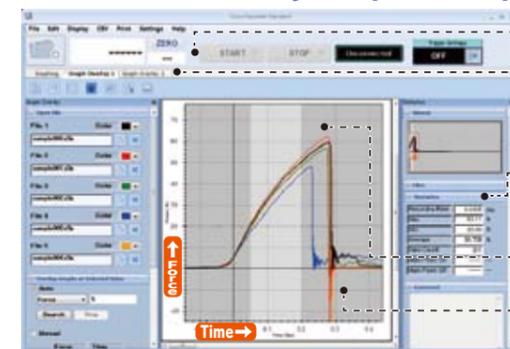
◎Easy steps for saving. Connect a force gauge and PC with a USB cable, and click START.

◎You can compare data easily due to plural tabs.

◎Auto-calculation of Maximum value/Minimum value/ Average value.

◎Comment insertions are possible.

◎Maximum 5 graphs are displayed on same display. Easy comparison and Accurate analysis are possible. (Standard/Professional version only)

■Capture measuring data accurately.
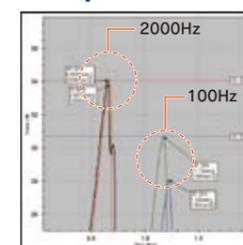
◎It graphs the measurement accurately due to high sampling rate, at Max.2000Hz

A peak value can be captured more precisely due to the higher sampling rate.

◀ Comparison of 2000Hz and 100Hz.
2000Hz is more to capture peak value than 100 Hz. Please refer to right [Operating envelopment 1] for the details of operating environments

■Create reports quickly
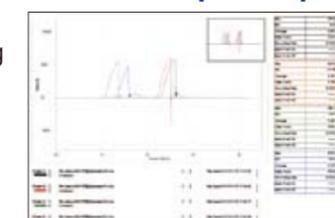
◎You can easily save data in Word, Excel, and PDF format, reducing the time to create reports.

◎It automatically inputs graphs, date & time, and statistics. You can also input comments manually if necessary.

■Force Recorder Professional

You can draw torque-angle graphs precisely at Max. 2000Hz with ease.

●For angle data acquisition, you need an angle meter in addition to DTXA/HTGA/eHT(eZT).
●TAA series (Page 13) come with this software.

【Function Comparison】

Version	Light	Standard	Professional
Feature	Graphing only	With editing functions	Torque-displacement graphing
Graph	Torque-time	Torque-time	Torque-time Torque-angle
Available models	HTGS/HTGA DTXS/DTXA eZT	HTGS/HTGA DTXS/DTXA eZT	HTGA DTXA eZT
Data transferring speed (Max)	2000 data / sec	2000 data / sec	2000 data / sec
Recording data point (Max)	7.2 million	7.2 million	7.2 million
Displacement output	N/A	N/A	○
Graph overlaying function	N/A	○	○
Trigger function	N/A	○	○
Point marking	N/A	○	○
Border line function	N/A	○	○
Capture function	N/A	○	○
Graph scaling	○	○	○
Statistics output	○	○	○
Comment	○	○	○
Print	○	○	○
CSV file converting	○	○	○
Preview saving (PDF/Word/Excel)	○	○	○
Torque gauge setting	○	○	○

■Force Recorder Standard／Light／Professional
【Operating Environment】

Operating environment	OS: Windows XP/Vista(32bit) 7/8/8.1(32bit/64bit)
Hardware	CPU: Pentium4 (1GHz more) more recommended Memory: 2GB more recommended Hard disk: 10GB (Data storage area) more
Plat form	.NET Framework4 more
Execute environment	Microsoft Internet Explorer6.0 later Windows Installer 3.1 later
Image size	Resolution 1024×768 pixel more
Compatible force gauge	Standard/Light: ZTA/ZTS series, HTGS/HTGA series, DTXA/DTXS series Professional: DTXA series, HTGA series, ZTA series
Connection port	USB1.1, USB2.0 connector * We do not guarantee operation in USB 3.0.

Cables/Printer

Cables expand the functionality of torque gauges.
We also provide a printer.

	HTGS/HTGA	DTXS/DTXA	eZT

The cables to connect a torque gauge to an external device

	HTGS/HTGA	DTXS/DTXA	eZT
RS232C cable Connects a PC to a torque gauge, enabling to record the measurement and transmit command signals from the PC to the gauge.	**CB-208** Length：Approx.3m	**CB-208** Length：Approx.3m	**CB-208** Length：Approx.3m
Digimatic cable Connects Mitutoyo Digimatic Mini Processor (a portable printer) to a torque gauge for printing the measurement.	**CB-308** Length：Approx.3m	**CB-308** Length：Approx.3m	**CB-308** Length：Approx.3m
Analog cable Connects analog devices such as a pen recorder to a torque gauge, enabling to record torque transition. CB-118 works for "-AN" option.	**CB-108** Length：Approx.3m	**CB-108** Length：Approx.3m	**CB-108** Length：Approx.3m
Open End cable Connects a torque gauge to a special device.	**CB-908** Length：Approx.3m	**CB-908** Length：Approx.3m	**CB-908** Length：Approx.3m
External Contact Point cable Enables to measure external contact points.	**CB-808** Length：Approx.3m	**CB-808** Length：Approx.3m	**CB-808** Length：Approx.3m

※1 CB-201(25P male) and CN-202(25P female) are also available.
※2 We offer customization including the length extension, connector's change in shape, and more.

The Cables for Past Models

If you need a cable for past-model force gauges/torque gauges, please refer to the right list. If your model is not mentioned in the list, please contact us.

【The Model List】

	HTG2,DTX2 series
Analog cable	CB-104
RS-232C cable	CB-204
Digimatic cable	CB-304
Force Control cable	

Printer DP-1VR

（Mitutoyo Digimatic Mini Processor）

◎It enables to print measuring Maximum/Minimum/Average standard deviation values.
To print, a digimatic cable is required.

Compatible models

HTGS／HTGA／DTXS／DTXA／eZT

Test Stands for Torque Testers

These motorized test stands are for DTXS/DTXA.
These test stands provide constant test speed due to automatic operation, and guarantee high repeatable test result.

MTS series

Precisely

◎High repeatability with constant test speed

Easily

◎Easy digital speed setting
◎Auto mode by a set torque

Efficiently

◎Automatic stopping with a set torque value
◎Durability test with a set number of test times
◎Automated data recording, interlocked with software
(You need an optional software to operate it.)

Check torque transition on graphs
Software Force Recorder ——————**To Page 08**

Analyze the Relation of Torque and Angle
Torque-Angle Analysis Unit TAA series ——**To Page 11**

MTS-10N
(The standard chuck is not included.)

Model	MTS-10N	MTS-10N-L	MTS-10N-2L
Capacity	10N-m		
Maximum height of a sample	140mm	240mm	340mm
Speed range	3～90 degree/sec		
Weight	Approx.14kg		
Size	W432×D400×H575mm	W432×D400×H675mm	W432×D400×H775mm
Function	Manual mode, JOG mode, Automatic mode(CONTINUOUS, ONE WAY) (*1) Overload preventing function (*1),Speed adjustment		
Voltage	AC100V ～240V , 50/60Hz, max 3A (*2)		
Accessory	Power cable , Torque gauge connecting cable (*3), Centering stick, Spare fuse, Instruction manual, tools, Packing cardboard		

※DTX series and attachments are sold separately. Please select one for each to complete testing system.

Option
●RA option(equipping an angle meter)
●Stroke Chenge

※1 Torque gauge should be connected with the cable (included).
※2 You may need to change fuse dependingon country.
※3 Standard model comes with CB-518. -RA (angle meter option) model comes with CB-728

Extension shaft (For -L,-2L)

Model：**MT-EXT** It is for MTS-10N-L. Please use this shaft when the height of your sample is 130mm or less. Or, you can also apply this shaft to MTS-10N-2L when the height of your sample is between 130-230mm.
Model：**MT-EXT2** It is for MTS-10N-2L. Please use this shaft when the height of your sample is 130mm or less.

Attachments for MTS

Attachments for MTS (Upper Part)

Standard chuck	Small chuck(※1)	Pin chuck	M10 adaptor

Model：**MT-TB**
Max. torque：10N-m
Sample diameter：φ20～90mm

Model：**MT-ST**(※1)
Max. torque：5N-m
Sample diameter：φ7～50mm

Max. torque：10N-m

Model	Diameter
MT-DC-13	Large φ1.2～13mm
MT-DC-6.5	Medium φ0.5～6.5mm
MT-DC-6.5SUS	Medium(Stain-less) φ0.5～6.5mm(※2)

Max. torque：5N-m

Model	Diameter
MT-DC-4	Small φ0.5～4mm

Model：**MT-AD-M10**
It helps you mount attachment with a M10 female screw.

※1 We provide a few more kinds of pins to fit your test samples. For more details, please refer to Page 04 of "Attachments for DTXS/DTXA"
※2 MT-DC-6.5sus (stainless model) is recommended under easy-to-rust environment.

TAA series
Torque-Angle Analysis Unit

With this unit, you can easily analyze the relation between torque and angle.

You can measure angle according to rotation, drawing a torque-angle graph.
This system is ideal for functionality assessment according to constant angle of rotation.

It shows torque vs angle graphically at real time (Max. 2000Hz)
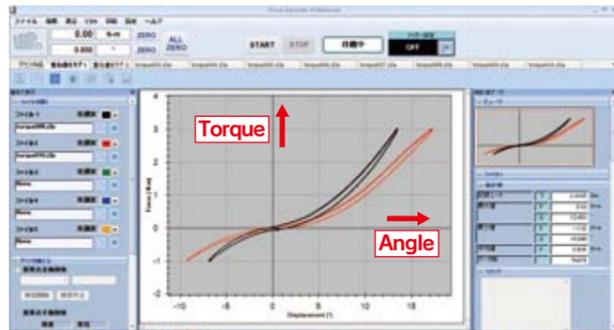
Torque

Angle

Basic Performance for Torque-Angle Measurement

- Easy connection to PC by USB
- Smooth graphing performance at 2000Hz
- Graph zooming function
- Possible to insert comment insertion on graphs
- Quick data export to WORD, EXCEL, PDF

Useful Functions for Measurements and Analysis

- Graph comparing function Max 5 graphs
- Reference line function
- Statistical calcuration (maximum/ minimum/ average values)
- Test trigger function (when the torque reaches to the the set displacement value)

【Specifications for Torque-Angle Analysis Unit TAA-MTS-TB series】

Model		TAA-MTS-○○N-TB (※1)
Unit	Torque	N-m/N-cm, kgf-m/kgf-cm, lbf-in/ozf-in(switchable)※
	Angle	°(degree)
Range		2N-m(200N-cm),5N-m(500N-cm),10N-m(1000N-cm)
Resolution	Torque	4 digit (Ex:The resolution of TAA-MTS-5N 0.001N-m[0.1N-cm])
	Angle	0.001°(on Force Recorder Professional)
		0.01°(on Torque gauge display)
Accuracy	Torque	±0.5%F.S. +/-1 digit
	Angle	±0.1°+/-1 digit
Model: Allowable sample height		TAA-MTS-□□N-TB:140mm TAA-MTS-□□N-L-TB:240mm TAA-MTS-□□N-2L-TB:340mm ※We can extend the height as custom-made. Please contact us. ※We can handle a wide rage of sample's height other than above-mentioned height. ※Please use extension shaft(page 10) as required.
Torque data sampling rate		2000 data /sec
Torque display upgrade		16 data/sec
Output		USB, Serial(RS232C), Analogue (Approx.±2V), Comparator, Overload, Sub comparator, USB flash drive ※USB flash drive is not included.
Function	Torque gauge	Customized display(header and footer)/ Peak Hold mode(CW/CWW)/ Internal memory (1000 data)/ Comparator(OK/NG judgment)/ Reversible display/ Sign inversion/ Zero clear timer/ +NG alarm/Off timer(Auto power off)/Damping/ Time display/ 1st 2nd peak/ Setting lock
	Test Stand	Manual mode, JOG mode, Speed adjustment
	Link function(※2)	Angle detection at torque peak / Angle zero reset at the selected torque/Automatic mode (CONTINUOUS,ONE WAY), Torque control, Overload prevention
Power supply	Torque gauge	Rechargeable battery (8 hour using /2 hour full charge)
	Test stand	AC100V～240V
Operating environment		Temperature:0 – 40 degree Celsius Humidity: 20 -80%RH
Accessory		Graphing software Force-Recorder Professional, Driver CD-ROM(with data logger simple software), Power cable, AC adapter, Torque gauge connecting cable(CB-728), USB cable, Spare fuse, Instruction manual, Inspection certificate, tool, packing cardboard box.
Included attachments(※3)		Lower side: DT-TB (refer to 04), Upper side: MT-TB (refer to 10)

※Japanese domestic model does not indicate kgf (kgf-m, kgf-cm) and lbf (lbf-in, ozf-in).
※1 Please select one from 2N, 5N, or 10N
※2 You need to connect a torque gauge with the included connecting cable to activate this function.
※3 We provide a model without any attachments (TAA-MTS+□N-Z). The model is recommended when you use other IMADA optional ones, or your own chuck.

Configuration

A Torque Stand
Upper side rotates at a set speed. You can set up test requirements such as a starting speed, a returning speed, pause at set torque value, and more.

Included Attachments
It comes with 2 attachments; MT-TB for upper side, and DT-TB for lower side. You can apply other optional attachments instead to fit your test samples.

A Torque Measurement Instrument
It displays torque and angle. You can easily take it on/off by screws when required.

A Connection Cable
It connect a torque tester with a torque stand for control.

Software
It shows torque vs angle graphically. You can take torque and angle data into your PC at real time (Max.2000Hz), drawing a smooth graph. Trigger function enables automatic graph drawing.

Other Torque-Angle Measurement Using HTGA

Measurement by Hand	Measurement by Handle Operation
How to measure: 1.Fix your sample with a chuck 2.Turn the sensor by hand You can draw torque vs angle graphs as required.	How to measure: 1.Set your sample on a fixed sensor 2.Rotate a handle You can draw a torque vs angle graph presicely with ease.
You can utilize this when you measure… ◉A rotary switch on car's dashboard ◉Motorcycle's accelerator etc.	You can utilize this when you measure… ◉torsion spring ◉A rotary switch etc.
Please contact us for further information.	Please contact us for further information.

Indicator

Sensor

Support

Chuck

Put your sample here

Manual test stand

Sensor
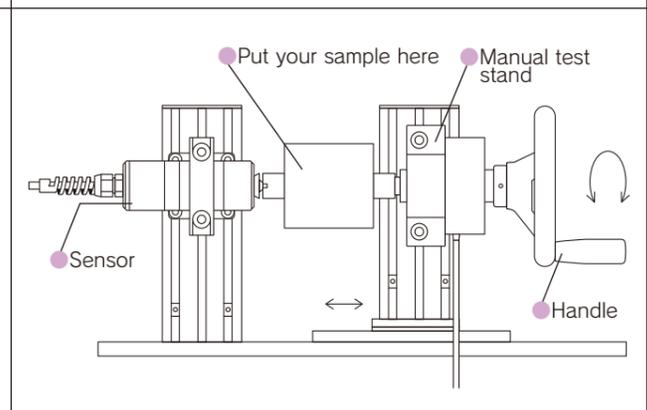
Handle

IMADA's food testers handle texture analysis and package testing for food yumminess and safety.

Food — **Texture analysis**   **Packaging** **Strength/opening tests**

IMADA's testers are widely used in food/beverage industry.
With IMADA testers, you can digitalize food textures such as hardness, stickiness, and more to ensure quality stability.
Besides, you can quantify the strength or operativity of packages to produce safe and stress-free ones.

Meat toughness

Sausage's texture

Retort pouch's withstanding pressure

Cheese stickiness

Piecrust's elastic force

Pasta's elasticity

Force to open a lid of a canned food container

Bread dough softness

Rice's stickiness

Force to open a lid of cup container

at a Preparation Step
(Stickiness / toughness / cutting force etc.)

Asparagus' bending force

at a Packaging Step
(opening / turning / pressing force etc.)

Force to open a lid of a jar

at a Cooking Step
(Elasticity / Texture)

We can offer testers complying with standards.
◉Food for person having difficulty in swallowing
◉Universal design food

Egg's elastic force

Force to peel heat-seal

Texture Analyzer	**Texture Analyzer**	**Bottle cap opening testers**
FRTS ——— To page 15	FRTS ——— To page 15	DTX series ——— To page 04
Simple food texture analyzer	**Simple food texture analyzer**	**Other tension/compression/peel testers**
FCA ——— To page 18	FCA ——— To page 18	For other tension/compression/peel tests including lid opening test for cup container or food canned container, please refer to another catalog "Force Gauges & Associated Equipment."

Texture Analyzer FRTS series

Food Texture Analyzer

FRTS series can digitalize textures such as stiffness, viscosity, elasticity, and more, allowing for data management.

Ideal for Texture Analysis

Palatability (yumminess) is the most important factor of food. "Palatability" is composed of taste, flavor, and texture. Texture represents chewability, firmness (sensation against the teeth), feeling on the tongue, feeling to the throat, and so on. The texture is expressed with food material characteristic and human sensation characteristic. The food material characteristic is categorized into mechanical characteristic, geometry characteristic, and others. FRTS series can measure the mechanical characteristic such as stiffness, elasticity, stickiness, and more.

Excellent Operability

◎You can operate it intuitively due to user friendly touch screen. ◎You can set up testing requirement very easily. ◎You can add maximum 6 testing conditions to "Favorites" to recall them quickly.

Great Precision

◎High accuracy: +/-0.2%F.S.+/-1digit ◎Sampling Speed: 1000Hz (You can capture peak value accurately due to high followability.)
◎You can save and recall testing conditions to uniformize testing condition.

Easy Care

◎You can easily clean up the measuring part since it is made of stainless.

◎You can readily detach the tray.

Easy Data Management and Analysis
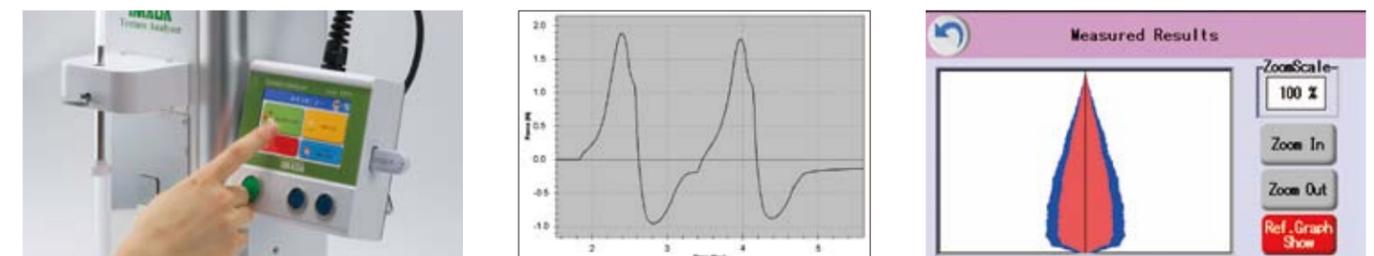
◎You can store data to accessory USB flash drive.

◎You can draw graphs on PC using accessory software.

◎You can see load distributions, and compare them very easily.

Choose a food to confirm a measuring method

◎There are 2 ways to decide a measuring method according to types of food;
  1. Use preset testing conditions without any changes. 2. Use preset conditions with some changes.
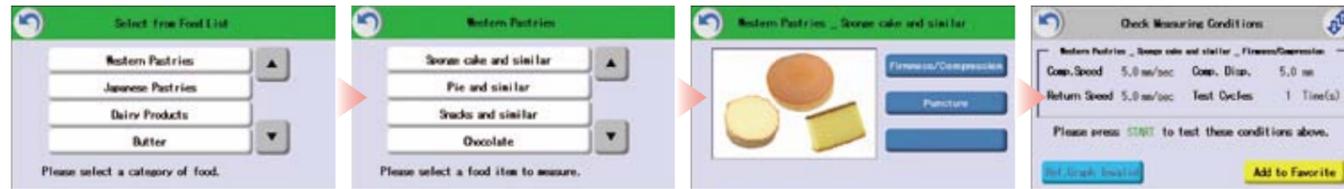
Food	Sweets	Japanese Sweets	Dairy Products	Butter	Noodles	Bread	Rice	Meat
Image								
Examples	Sponge cake Pie Snack Chocolate Candy Jelly Kneaded dough	Steamed bun Rice cracker Monaka skin Dorayaki and the like Dough	Processed cheese Yoghurt Ice cream	Butter	Uncooked noodle (a piece) Boiled noodle (a piece) Dried noodle (a piece) Noodle dough	Bread Donut Kneaded dough	Cooked rice (a piece) Clump of cooked rice Uncooked rice (a piece) Rice dumpling	Hamburg steak (Cooked meat) Hum (Processed meat) Kneaded raw meat Raw meat

Food	Fish and Seafood	Paste	Beans	Nuts	Eggs	Vegetables	Mushrooms	Fruits
Image								
Examples	Grilled Fish (Cooked fish) Raw fish	Fish sausage (Kamaboko) Paste	Cooked bean (a piece) Clump of cooked beans Tofu Uncooked bean (a piece)	Peanut	Egg shell Raw egg Boiled egg Omelet Custard pudding	Cut vegetables Carrot (Root vegetables) Cucumber (Stick-shaped vegetables) Pepper (Hollow vegetables) Lettuce (Leaf vegetables)	Mushroom	Cut fruit Jam Grape (a piece) Apple (Pome fruits)

Choose a test standard to confirm a measuring method

◎Measuring conditions complying with standards are preset.

Standard	Outline	Measured Result
Food for person having difficulty in swallowing	Complying with required measuring method, it measures softness, cohesive property, and adherability using included software.	3-step judgement method (Permission Criteria I / II / III)
Universal design food	It measures firmness according to required measuring method.	4-steps judgement (Able to chew easily / able to smash with gum / able to smash with tongue / able to swallow without chew)
JIS K6503 Animal glues and gelatins	It measures firmness according to required measuring method.	Force value (N)
ISO 16035 Butter	It measures firmness according to required measuring method.	Force value (N)
ISO 9665 Animal glues	It measures firmness according to required measuring method.	Force value (N)
Former JAS Special packaging for Kamaboko and the like	It measures firmness according to required measuring method.	Force value (N)
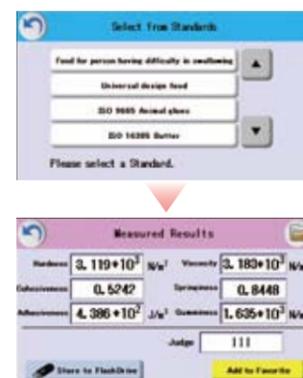
Set measuring conditions by yourself

◎You can set measuring conditions such as displacement, test speed, number of tests by yourself.

【Specifications for FRTS series】

Accuracy	Force	+/-0.2%F.S.+/-1 digit
	Displacement	0.1mm+/-1digit
Measurement unit	Force	N / Kgf / lbf (※1)
	Displacement	mm / inch (※1)
Indication	Force	4-digit
	Displacement	0.001mm (as the minimum resolution)
Sampling speed		1000Hz
Sample's maximum height		70mm (※2)
Table travel distance		Max. 100mm
Speed		0.1 – 10.0mm/sec
Functions		3 types of measuring method (Food/Standard(※3), Program, Manual),Add-a-favorites for measuring conditions (Max.6 conditions), Start-trigger function,Overload preventing function (※4)
Output		USB, USB flash drive
Accessory		Graphing software, Power cable, USB cable, USB flash drive, Attachment (4 kinds), Fuse, Instruction manual, Inspection certificate
Operating environment(※5)		Temperature: 0 to 40 degree Celsius Humidity: 20 to 80 %RH
Weight		Body: 7.7kg Control Panel: 0.8kg
Size		185 x 300 x 400 mm (except its control panel)

※1　The units are switchable. The units differs from Japanese domestic model.
※2　It is the maximum distance from its table surface to the part where an attachment is mounted.
※3　You need PC for measurement to comply with some standards.
※4　You cannot prevent overload in some cases.
※5　You cannot use this product under a vibratile environment.

【Model】

Model	Capacity	Resolution
FRTS-5N	5N	5.000N
FRTS-50N	50N	50.00N
FRTS-100N	100N	100.0N

Included Software

◎You can connect FRTS to PC via USB cable easily.
◎It automatically starts graphing when measurement starts. It can draw force-time or force-displacement graph, calculating characteristics such as firmness, adhesion, cohesive property, adherability, elasticity, gumminess. Besides, you can overlay graphs for detailed analysis.
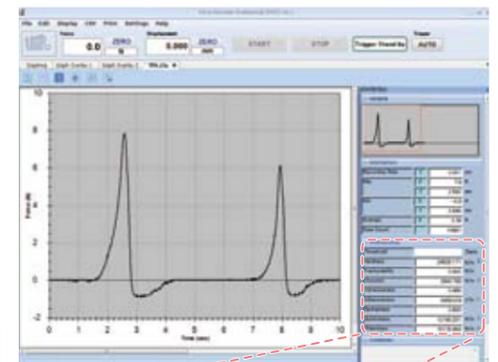
【Software operating environment】

Operating environment	Windows Vista/7/8/8.1　※32 bit only for Vista
Hardware	CPU: Pentium4 (more than or equal to 1GHz) recommended Memory: more than or equal to 2GB recommended Hard disk: more than or equal to 10GB (data storage area) needed
Plat form	.NET Framework 4 or later
Execute environment	Microsoft Internet Explorer 6.0 or later Windows installer 3.1 or later
Connection port	USB1.1, USB2.0 connector ※We do not guarantee operation in USB3.0.

You can change attachments according to your testing needs.

We offer a wide range of attachments to fit your measurement needs.

Change attachment

Mount shaft to attachment

Turn the knob and mount attachment.

Tip
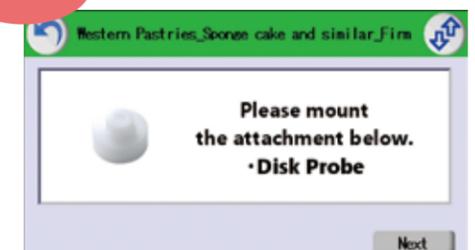
A recommended attachment is indicated when you choose preset measuring method.

Attachments for Food Tests

Attachments exclusive for Food testers

We offer a wide range of attachments to fit your testing needs.

Optional probes and tables can handle various measurement.

Compression

Disk probe
Model: FR-HA-D
※1

D
20
30
50

Cylindrical probe
Model: FR-EC-D
※1

D
3
5
8
10
12.7
15

Conical probe
Model: FR-ES -θ-D
※1

θ	D
45	20
60	30

Sphere probe
Model: FR-SR-D
※1

D
5
7
10
20

Yogurt cutter
Model: FR-YN-29

Vice pin for sticking
Model: FR-CP-3

3 point bending fixture
Model: FR-TP-60

Tension

Special grip for noodle
Model: FR-NP-25

Small grip
Model: FR-SC-3

Film grip (small)
Model: FR-FC-21

Film grip (large)
Model: FR-FC-41

Shearing

Cutter
Model: FR-NB-80

Wire-cutter
Model: FR-WK-85

Wedge probe
Model: FR-KS-θ-20 30
※1

θ
45
60

Optional table

Wide table
Model: FR-LT-120

Center lined table
Model: FR-CT-80

Table with trench
Model: FR-GT-W
※1

W
3
5
10

Container holder table
Model: FR-BG-60

Sample holder table
Model: FR-UP-D
※1

D
5
10
25
50

Stick guide plate
Model: FR-KP-D
※1 ※2

Stick holder
Model: FR-ST-25

Anti-Scattering sheet
Model: FR-DP-80

D
3
5
10

We offer more kinds of probes and tables other than above-mentioned ones. We can custom design and manufacture to meet your particular requirement.
※1 Please choose designated length in □ when you order.   ※2 Sample holder table is required when using Stick guide plate.

length:mm angle:degree(°)

Food Firmness Measurement Unit

FCA-DS2-50N

You can set a travel distance to move a force gauge, then easily measure firmness or force to crush food.

Simple measurement due to lever operation

Easy care due to stainless made

Easy set for travel distance by knob

Type	Crush / Compress	Cut / Break
Features	It compresses food with disk probe to measure elasticity, firmness, softness etc.	Crispiness can be measured in a similar way to biting with teeth using a wedge probe.
Sample examples	Grain processed food (boiled bean, bread, tofu, rice cake) Dough (bread, noodle) Others (pudding, jam, cream cheese)	Meat processed food (Sausage) Sweets (cookie, chocolate, gum, rice crucker) Others (processed cheese, pasta)

Model	FCA-DS2-50N-1	FCA-DS2-50N-2
Capacity	50N	
Display	50.00	
Accuracy	±0.2%F.S.±1digit	
Measurement unit	N / kgf / lbf (※1)	
Travel distance (stroke)	0 - 45 mm (adjustable by limit knob)	
Measuring space	50～80mm (※2)	
Battery	10 hours (10 hours charging)	
Overload	Approx. 200% F.S.	
Operating environment	Temperature: 0 – 40 degree Celsius Humidity: 20 – 80%RH	
Weight	Approx.3kg	
Size	Approx. W175 × D178 × H296 mm	
Unit	Force gauge DS2-50N-M4 (※3) Lever type test stand FCA-50N	Others (Manual, mounting screws, tool, inspection certificate)
Included attachment	Disk probe	Wedge probe

※1 Japanese domestic model does not indicate kgf and lbf (ozf).
※2 It is the distance between the table and top point of an attachment. The distance may become short depending on the force gauge's position and a kind of attachment.
※3 This force gauge differs from DS2 series. It carries M4 measuring thread for FCA.