

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.



Torque Gauges

Turning / Twisting Force Testing



- 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
- Torque and angle testing P11

Texture Analyzer

Food firmness testing



- Food testing applications P13
- Food texture analyzer P14
- Attachments P17
- Easy way to test food firmness
Simple food firmness test measurement unit P18

Index

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

C		F		M	
CB series	09	FCA-DS2-50N	18	MT-AD-M10	10
		Force Recorder Light	08	MT-DC-13/MT-DC-6.5/MT-DC-6.5SUS/MT-DC-4	10
		Force Recorder Professional	08	MT-EXT/MT-EXT2	10
D		Force Recorder Standard	08	MTS series	10
DP-1VR	09	FR series (Attachment for food testing)	17	MT-ST	10
DT-DC-13/DT-DC-6.5/DT-DC-6.5SUS/DT-DC-4	04	FRTS series	14	MT-TB	10
DT-ST/DT-ST-01/DT-ST-02	04				
DT-TB/DT-TB-01/DT-TB-02	04				
DTXS/DTXA series	03	H		O	
		HT-AD-M10	06	OW-025/OW-10/OW-20/OW-60	06
		HT-DBH	06		
E		HT-DC-13/HT-DC-6.5/HT-DC-6.5SUS/HT-DC-4	06	S	
eDPU series	07	HTGS/HTGA series	05	SHT-5N	06
eHT series	07	HT-ST/HT-ST-01/HT-ST-02	06		
eLM series	07	HT-9.5SQ	06	T	
eZT	07			TAA-MTS series	11
		I		TB-SP	04
		I-8/I-80	06		

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

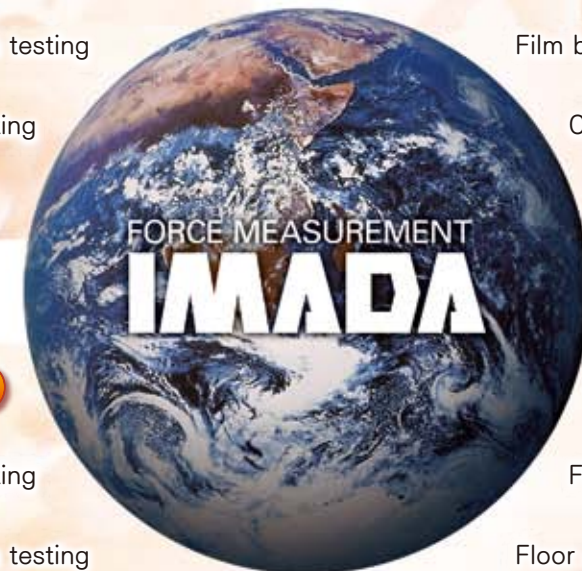
- Bottle cap pull-off testing
- Film breaking force testing
- Cork pull-off force testing

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



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.



Torque Gauges

Torque Gauge Measuring Rotating/Twisting Force

“Torque” is the tendency 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 lbf-in/ozf-in.

IMADA torque gauges enable you to measure torque easily and accurately.



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.

Making efficient

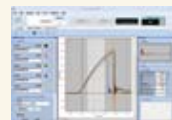
- High working efficiency due to manual operation
- You can easily capture peak value using peak hold function.
- You can pick out defective products easily using OK/NG judgement function.

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 (without the table and the pins.)
- Weight: Approx. 4.5kg (including Standard table and 4 pc. Standard pins.)



CE

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

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. ±1 digit
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)(※4)
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 DTXA)(※4)

※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.

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 (1000.0N-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 (1000.0N-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-00N-Z or DTXA-00N-A
The model with a smaller table: DTXS-00N-ST or DTXA-00N-ST

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

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-00N-ST when combining with DTXS/DTXA body.※1)



Standard table and Notch pins

(DTXS/DTXA-00N-ST-01 when combining with DTXS/DTXA body.※1)



Standard table and Long clamp pins

(DTXS/DTXA-00N-ST-02 when combining with DTXS/DTXA body.※1)



Small table and Standard pins

(DTXS/DTXA-00N-ST when combining with DTXS/DTXA body.※1)



Small table and Notch pins

(DTXS/DTXA-00N-ST-01 when combining with DTXS/DTXA body.※1)



Small table and Long clamp pins

(DTXS/DTXA-00N-ST-02 when combining with DTXS/DTXA body.※1)



Pin chuck



Ideal for gripping columnar samples.

Large ϕ 1.2~13mm Model:DT-DC-13

Medium ϕ 0.5~6.5mm Model:DT-DC-6.5

Medium Stainless Steel

ϕ 0.5~6.5mm Model:DT-DC-6.5SUS※2

Small ϕ 0.5~4mm Model:DT-DC-4

Sample stage



This stage helps you put a sample stably
Model:TB-SP

※1 Please choose 00N from 2N, 5N or 10N and □N from 2N or 5N.

※2 We recommend to use Stainless steel type under easy-to-rust environment.

Handheld Digital Torque Gauge

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



Print the Results

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



Analyze the Relation of Torque and Angle

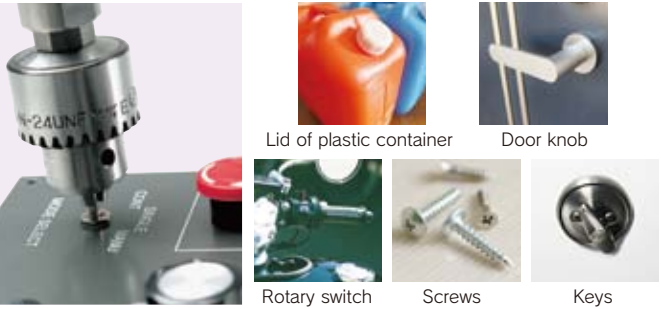
Torque-Angle Analysis Unit TAA series – To page 11

Accuracy	±0.5%F.S. ± 1 digit
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)

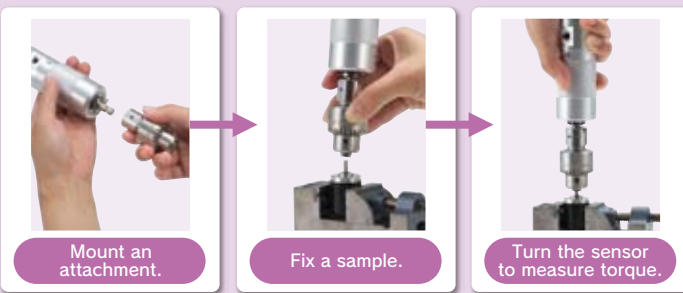
※1 These are the specifications for International model. Please note that this unit is different from Japanese domestic model.
※2 Angle(displacement) scale is necessary to valid this function.
※3 Not always available for Mitutoyo digimatic products.
※4 USB flash drive is not included.
©No attachments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

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)

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



How to Measure



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: ϕ 1.2~13mm
Weight: approx. 600g
※Cannot be used for 2N-m or 0.5N-m range

Standard pin chuck

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

Small pin chuck

Model: **HT-DC-4**
Opening width: ϕ 0.5~4mm
Weight: approx. 100g

Socket holder

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

Torque driver

Ideal for measuring tightening / losing 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: ϕ 7~50mm
※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: ϕ 7~50mm
※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: ϕ 7~50mm
※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

※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	ϕ 28×44	ϕ 32×51	ϕ 32×51	ϕ 32×69

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)
Accessories	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	Male Screw MGP1.0
eDPU-5N	5N	
eDPU-10N	10N	
eDPU-20N	20N	
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 100Hz. Please refer to right [Operating environment 1] for the details of operating environments

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.

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.

[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.



The cables to connect a torque gauge to an external device

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.)

Option

- RA option(equipping an angle meter)
- Stroke Change

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

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.

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: φ 20~90mm	Model: MT-ST (※1) Max. torque: 5N-m Sample diameter: φ 7~50mm	Max. torque: 10N-m Model MT-DC-13 Large φ 1.2~13mm MT-DC-6.5 Medium φ 0.5~6.5mm MT-DC-6.5SUS Medium (Stain-less) φ 0.5~6.5mm (※2) Max. torque: 5N-m Model MT-DC-4 Small φ 0.5~4mm	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.

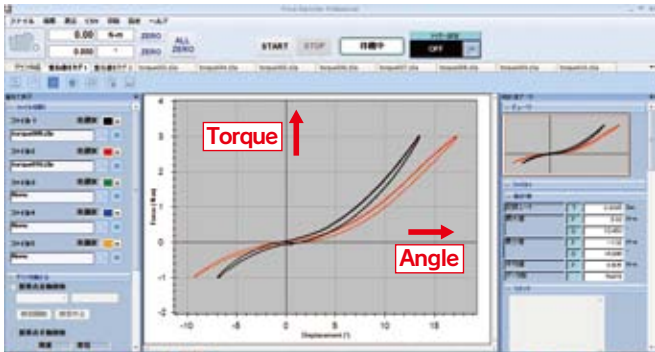
TAA series Torque-Angle Analysis Unit

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)



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 calculation (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-〇〇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.

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.

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.

Other Torque-Angle Measurement Using HTGA

Measurement by Hand

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.

You can utilize this when you measure...

- A rotary switch on car's dashboard
- Motorcycle's accelerator etc.

Please contact us for further information.

Measurement by Handle Operation

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...

- torsion spring
- A rotary switch etc.

Please contact us for further information.

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

Cheese stickiness

Bread dough softness

Piecrust's elastic force

Pasta's elasticity

Rice's stickiness

Asparagus' bending force

Egg's elastic force

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

at a Cooking Step
(Elasticity / Texture)

We can offer testers complying with standards.

- Food for person having difficulty in swallowing
- Universal design food

Texture Analyzer FRTS To page 15

Simple food texture analyzer FCA To page 18

Sausage's texture

Retort pouch's withstanding pressure

Force to open a lid of a canned food container

Force to open a lid of cup container

Force to open a lid of a jar

Force to peel heat-seal

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

Bottle cap opening testers DTX series To page 04

Other tension/compression/peel testers

For other compression/tension/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

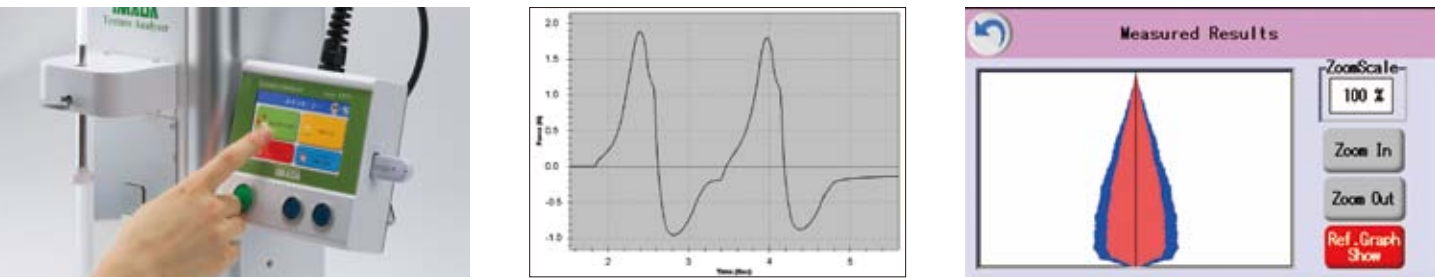
- High accuracy: +/-0.2%F.S./+/-1digit
- Sampling Speed: 1000Hz (You can capture peak value accurately due to high followability.)
- You can save and recall testing conditions to uniformize testing condition.

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

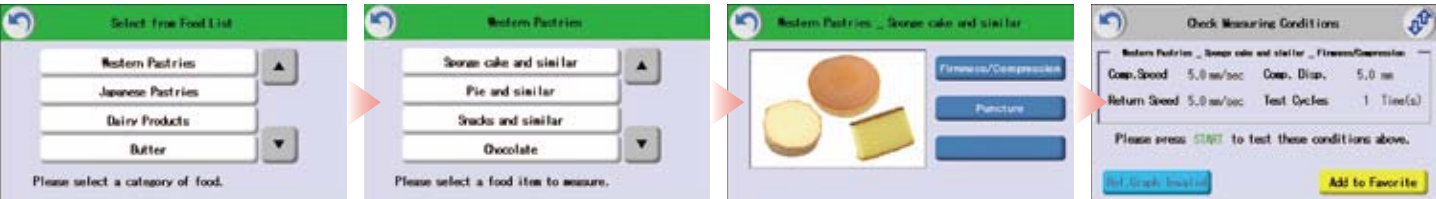


- You can store data to accessory USB flash drive.
- You can draw graphs on PC using accessory software.
- You can see load distributions, and compare them very easily.

How to Start Measurement

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.

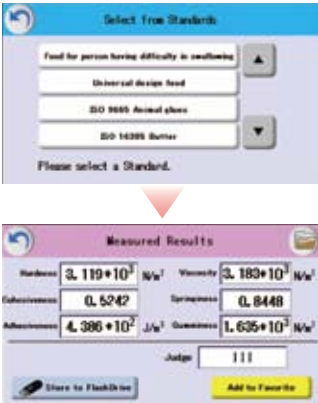


Food	Sweets	Japanese Sweets	Dairy Products	Butter	Noodles	Bread	Rice	Meat
Image								
Examples	Sponge cake Pie Snack Chocolate Candy Jelly Kneaded dough	Steamed bun Rice cracker Monaka skin Dorayaki and the like Dough	Processed cheese Yoghurt Ice cream	Butter	Uncooked noodle (a piece) Boiled noodle (a piece) Dried noodle (a piece) Noodle dough	Bread Donut Kneaded dough	Cooked rice (a piece) Clump of cooked rice Uncooked rice 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 adhesibility 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+/-1 digit
Measurement unit	Force	N / Kg / 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.

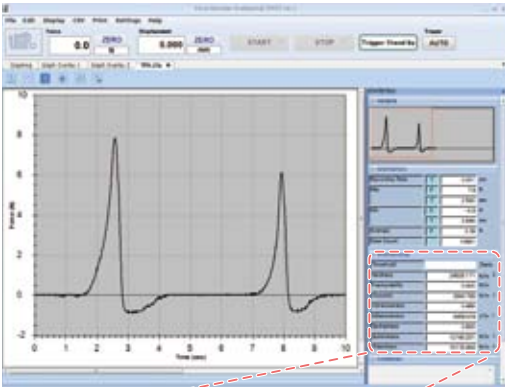
Model

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

Optional table

Wide table
Model:FR-LT-120

Center lined table
Model:FR-CT-80

Table with trench
Model:FR-GT-[W]
※1

Container holder table
Model:FR-BG-60

Sample holder table
Model:FR-UP-[D]
※1

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

Stick holder
Model:FR-ST-25

Anti-Scattering sheet
Model:FR-DP-80

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

TECNIMETAL

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.

Easy care due to stainless made

Simple measurement due to lever operation

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 cracker) Others (processed cheese, pasta)
Model	FCA-DS2-50N-1		FCA-DS2-50N-2
Capacity	50N		
Display	50.00		
Accuracy	±0.2%F.S. ±1 digit		
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.

Table of contents

Torque Testers

Testers for Food Industries

17

18