

FORCE MEASUREMENT  
**IMADA**  
 Product Catalog  
 Torque and Food Testers  
 TORQUE GAUGES  
 TEXTURE ANALYZER  
**2023-1**



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.



**Next Series**

A group of upgraded measurement devices with new PCBs. Those devices under Next Series enable a variety of benefits online through the user support site.



**Torque Testers**

IMADA's torque testers can measure 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  
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The further product information is on our Product and Service Site.

<https://www.forcegauge.net/en/>

Please visit our Corporate Site which introduce a wide range of information of force measurement.

<https://force-channel.com/en/>



- 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 actual products.
- We show specifications partially, so please see full specifications on our website or contact us before purchase.

Agency



[www.unimetra.cz](http://www.unimetra.cz)

# Turning / Twisting Force Testing



- Screw cap torque tester P05
- Handheld torque testers P08
- Torque meter for motor screw drivers and torque drivers P10
- Sensor interchangeable amplifiers P11
- Software for graph drawing P12
- Motorized torque test stands providing high repeatability due to automatic operation P14
- Torque and angle testing P15

# Food characteristic testing



- Food texture analyzer P18
- Food testing applications P19
- Attachments P20
- Easy way to test food firmness  
Simple food firmness test measurement unit P21

## Index

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

<b>A</b>		Force Recorder Light	12	MT-AD-M10	14
AMK series	09	Force Recorder Plus	12	MT-DC-13/MT-DC-6.5/MT-DC-6.5SUS/MT-DC-4	14
		Force Recorder Professional	12	MT-EXT/MT-EXT2	14
<b>C</b>		Force Recorder Standard	12	MTS series	14
CB series	13	FR series (Attachment for food testing)	20	MT-ST	14
		FRTS series	18	MT-TB	14
<b>D</b>					
DT-DC-13/DT-DC-6.5/DT-DC-6.5SUS/DT-DC-4	07	<b>H</b>		<b>O</b>	
DT-ST/DT-ST-01/DT-ST-02	07	HT-AD-M10	09	OW-025/OW-10/OW-20/OW-60	10
DT-STL/DT-STL-01/DT-STL-02	07	HT-DBH/HT-DBH-P	09	<b>R</b>	
DT-STLW/DT-STLW-01/DT-STLW-02	07	HT-DC-13/HT-DC-6.5/HT-DC-6.5SUS/HT-DC-4	09	<b>S</b>	
DT-TB/DT-TB-01/DT-TB-02	06	HTGS/HTGA series	08	RSH series	09
DTXS/DTXA series	05	HTGS/HTGA-TFX series	10	<b>T</b>	
		HT-ST/HT-ST-01/HT-ST-02	09	<b>E</b>	
		HT-STL/HT-STL-01/HT-STL-02	09	eDPU series	11
		HT-STLW/HT-STLW-01/HT-STLW-03	09	eHT series	11
		HT-STW/HT-STW-01/HT-STW-02	09	eTFX series	11
		HT-9.5SQ	09	eZT	11
		TAA-MTS-TB/TAA-HTG series	15	<b>F</b>	
		TB-SP	07	FCA-DSV-50N	21
<b>I</b>		<b>W</b>		<b>M</b>	
I-8/I-80		10	WL01-ADP/WL01-USB		13

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



IMADA force gauges have been used worldwide for more than 75 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
- Package crushing strength testing

**Tension Force Testing**

- Fiber cutting force testing
- Film breaking force testing
- Cork pull-off force testing

**Peeling / Adhesion Force Testing**

- Packaging opening force testing
- Corrugated cardboard adhesion testing
- Tape peel testing

**Coefficient of Friction**

- Film coefficient of friction testing
- Floor coefficient of friction testing
- Grip coefficient of friction testing

## 75 Years History of IMADA Force Gauge

**In 1947**  
Developed the first force gauge in Japan.

PS (1947) → DPS (1984) → PS (1959) → DPS-S (1987) → PS (1965) → SS II (1989) → PS (1972) → DPSS-T/DPSS (1995) → PS (1979) → DPS (1996) → PS/FB/PSM (1993) → DS2 (2006) → DS/DST (2017) → DPRS-T (1988) → DPRSX-T (1994) → DPX-T/DPX (1997) → DPZ (2002) → ZP/ZZ (2004) → ZTA/ZTS (2013)

**The Latest Force Gauges**  
Capable, Functional and User-friendly force gauge, ZT series are released.



# Next Series ~Continue to Evolve

Typified by ZT digital force gauge series, Next Series is a generic term to describe the next generation models of IMADA measurement devices.

Unlike previous models, these devices under Next Series are equipped with new PCBs allowing them to avail various benefits on our user support website.

Especially additional functions downloadable on the site expand the usage scenes of the devices by improving efficiency or safety in measurement or enhancing the compatibility of test data.


Consequently, Next Series devices have high customizability to meet complex needs of each user.

IMADA, a solution provider in Force Measurement, increases both hard and software product line-ups to enable various measurements for more comprehensive requirements.



Scan the QR code for the latest line-ups of the Next Series and additional functions



Refer to  for the Next Series products in this catalogue (as of Jan 2023)

**User Support Site**  
**IMADA-Connected**



**IMADA Connected**

With your account and product registrations, You can download additional functions, software, operating manuals, etc. from this website.



<https://www.imada-connected.com/>

# Torque Gauges

## Torque Gauge Measuring Rotating/Twisting Force

“Torque” is the force that can cause an object to rotate 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

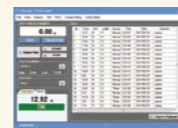
- High Luminance Organic EL display  
Clear organic display has excellent readability.
- 8 languages are available  
Setting menu in 8 languages helps easy operation.

### Making efficient

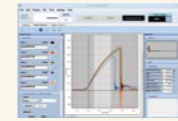
- High working efficiency due to manual operation
- Easily capture peak value using peak hold function.
- Picks out defective products easily using OK/NG judgement function.

### Easy data management on PC

- Easy connection with USB interface
- Data capturing software Force-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 12 for further information.



▲ Torque capturing software Force-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.)



### DTXA

High-functional type

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

### Inputting/Outputting Angle

- DTXA indicates both torque and angle on its monitor, combined with an angle meter.  
Torque-Angle Analysis with DTXA Go to page 15

### Capturing 2 Peaks

- Captures 1st and 2nd peaks of measurement.

### Saving Data to USB Flash Drive

- Saves continuous data into USB flash drive at 100Hz.  
In other words, data can be saved even without PC.



Check Torque Transition on Graphs  
Software Force Recorder — To page 12



Transmit Data Wirelessly  
Wireless Unit WL01-ADP/WL01-USB — To Page 13



Improve Measuring Repeatability  
Motorized Torque Test Stand — To page 14



Analyze the Relation of Torque and Angle  
Torque-Angle Analysis Unit TAA series — To page 15

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, ±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) (※3)
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) (※3)

※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 USB flash drive is not included.

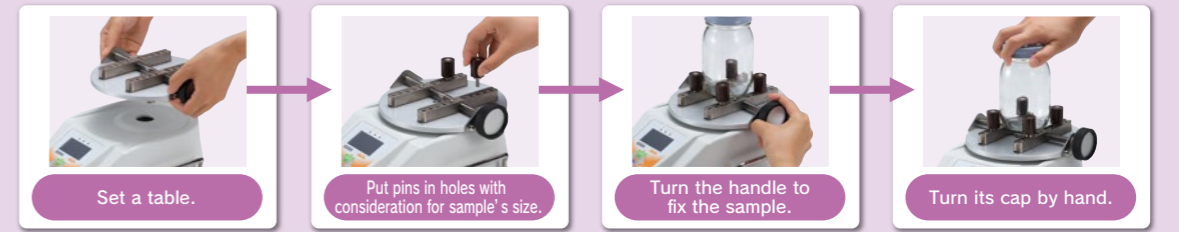
Model	Capacity	Display
DTXS-0.5N-Z (※1)	0.5N-m (50N-cm)	0.500N-m (50.00N-cm)
DTXS-2N	2 N-m (200N-cm)	2.000N-m (200.0N-cm)
DTXS-5N	5 N-m (500N-cm)	5.000N-m (500.0N-cm)
DTXS-10N	10N-m (1000N-cm)	10.00N-m (1000N-cm)
DTXA-0.5N-Z (※1)	0.5N-m (50N-cm)	0.500N-m (50.00N-cm)
DTXA-2N	2 N-m (200N-cm)	2.000N-m (200.0N-cm)
DTXA-5N	5 N-m (500N-cm)	5.000N-m (500.0N-cm)
DTXA-10N	10N-m (1000N-cm)	10.00N-m (1000N-cm)

※1 The Unit shown in only "N-cm"  
※1 The Table and the Pins sold separately.  
※ The above model except DTXS-0.5N-Z and DTXA-0.5N-Z are models with a standard table and standard pins. DTXS-0.5N-Z and DTXA-0.5N-Z are models with a standard table and standard pins.  
DTXS-0.5N-Z and DTXA-0.5N-Z are models with a standard table and standard pins.

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



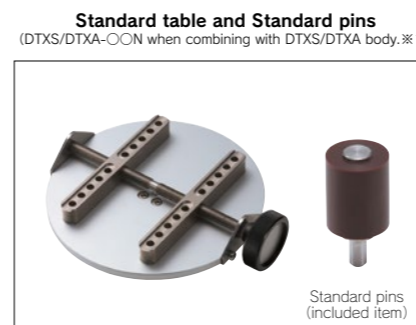
## How to Measure



## Attachment for DTXS/DTXA

We provide several kinds of interchangeable tables to fit your test samples.

※Only pins without tables are available. Please see our web page for further information.



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



Ideal for slippery samples such as aluminium cans.  
Model: **DT-TB-01**  
Capacity: 10N-m  
Allowable sample diameter: φ20~160mm

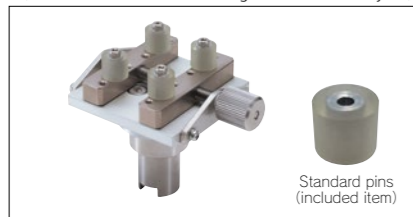


Ideal for tall samples such as 2 liter PET bottles.  
Model: **DT-TB-02**  
Capacity: 10N-m  
Allowable sample diameter: φ20~160mm

※1 Please choose OON from 2N, 5N or 10N.

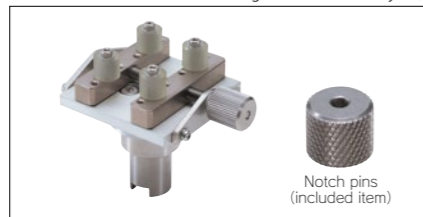
## Attachment for DTXS/DTXA

### Small table and Standard pins



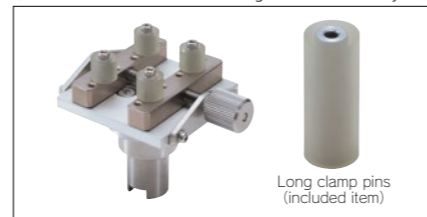
DTXS/DTXA-□N-ST when combining with DTXS/DTXA body.※1  
Ideal for measuring torque of small samples such as eye drop bottles.  
Model: **DT-ST**  
Capacity: 2~5N-m  
Allowable sample diameter: φ 7~50mm

### 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** ※Image is for illustration purposes. Actual attached pin is Notch pins  
Capacity: 2~5N-m  
Allowable sample diameter: φ 7~50mm

### 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** ※Image is for illustration purposes. Actual attached pin is Long clamp pins  
Capacity: 2~5N-m  
Allowable sample diameter: φ 7~50mm

### Light weight small table and Standard pins



Suitable for measuring small samples such as plastic tubes.  
Model: **DT-STL**  
Available torque: 0.5~2N-m  
Allowable sample diameter: φ 7~50mm

### Light weight small table and Notch pins



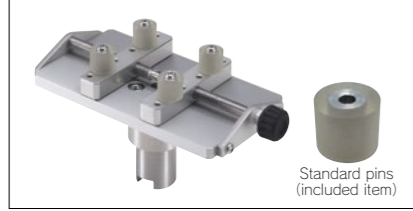
Ideal for firmly fixing samples such as small motors.  
Model: **DT-STL-01**  
Available torque: 0.5~2N-m  
Allowable sample diameter: φ 7~50mm  
※Image is for illustration purposes. Actual attached pin is Notch pins

### Light weight small table and Long clamp pins



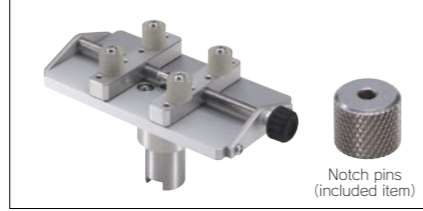
Ideal for fixing slim samples such as cosmetic containers.  
Model: **DT-STL-02**  
Available torque: 0.5~2N-m  
Allowable sample diameter: φ 7~50mm  
※Image is for illustration purposes. Actual attached pin is Long clamp pins

### Light weight wide table and Standard pins



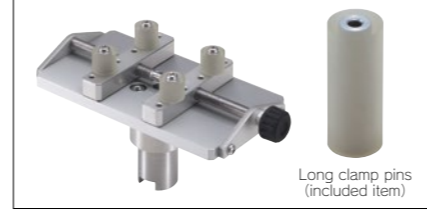
Suitable for measuring samples such as volume dials.  
Model: **DT-STLW**  
Capacity: 0.5~2N-m  
Allowable sample diameter: φ 10~100mm

### Light weight wide table and Notch pins



Ideal for firmly fixing samples such as motors.  
Model: **DT-STLW-01**  
Capacity: 0.5~2N-m  
Allowable sample diameter: φ 10~100mm  
※Image is for illustration purposes. Actual attached pin is Notch pins

### Light weight wide table and Long clamp pins



Ideal for fixing long and wide samples such as bottle shaped containers and diapers.  
Model: **DT-STLW-02**  
Capacity: 0.5~2N-m  
Allowable sample diameter: φ 10~100mm  
※Image is for illustration purposes. Actual attached pin is Long clamp pins

### Pin chuck



Ideal for gripping columnar samples.

### Large pin chuck

Model: **DT-DC-13**  
Capacity: 2~10N-m  
Opening width: φ 1.2~13mm

### Standard pin chuck

Model: **DT-DC-6.5**  
Capacity: 2~10N-m  
Opening width: φ 0.5~6.5mm

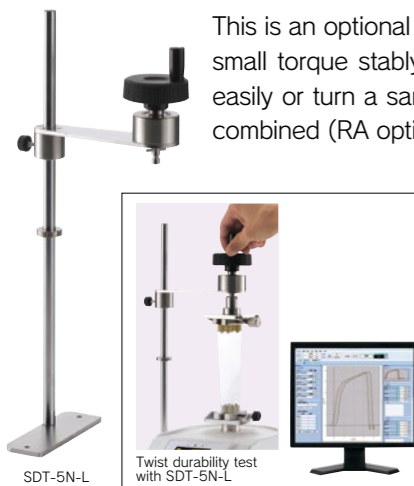
Model: **DT-DC-6.5SUS**※2 (Stainless)  
Capacity: 2~10N-m  
Opening width: φ 0.5~6.5mm

### Small pin chuck

Model: **DT-DC-4**  
Capacity: 2~5N-m  
Opening width: φ 0.5~4mm

※1 Please choose □ from 2N or 5N.  
※2 We recommend to use Stainless steel type under easy-to-rust environment.

## Rotation Support Jig for DTXS/DTXA

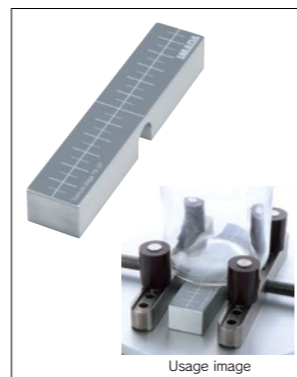


This is an optional turn handle for DTXS/DTXA. The turn handle enables applying small torque stably. Beside, the handle helps you turn very small sample more easily or turn a sample 360 degree or more. If required, an angle meter can be combined (RA option), allowing analysis of torque resistance-angle relation.

Model	SDT-5N	SDT-5N-L	SDT-5N-2L	SDT-5N-RA	SDT-5N-RA-L	SDT-5N-RA-2L
Feature	Standard			With an angle meter		
Capacity	5N-m					
Max. Sample Height (mm) (When use with HT-STL/DT-STL series)	145	245	345	145	245	345
Max. Sample Height (mm) (When use with HT-STL/DT-ST series)	136	236	336	136	236	336
Weight (g)	1094	1181	1313	956	1043	1175
Accuracy	±0.1°					
Measuring Range	0.1~9999.9°					
Available Attachment ※1	Attachments for HTGS/A (P09)					

※1 To be mounted the upper turning part.

## Sample stage



Sample stage TB-SP (for DTX series standard table) Used on the Standard Table DT-TB series (P.06) to stabilize the sample.  
Model: **TB-SP**

## 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 are available  
Setting menu in 8 languages helps easy operation.

### Making efficient

- OK/NG judgment  
Picks 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 09 for further information.

### 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 15



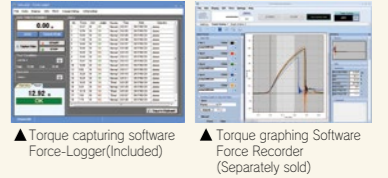
Check Torque Transition on Graphs  
Software Force Recorder - To page 12



Transmit Data Wirelessly  
Wireless Unit WL01-ADP/WL01-USB - To Page 13

### Easy data management on PC

- Easy connection with USB interface
- Data capturing software Force-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 12 for further information.



▲ Torque capturing software Force-Logger (Included)  
▲ Torque graphing Software Force Recorder (Separately sold)

### HTGS

Standard Type



Size (The indicator) : Approx. W75XD34XH187mm  
(The sensor) : Approx. φ 39XL120mm  
Weight (The indicator) : Approx. 490g  
(The sensor) : Approx. 430g

### Capturing 2 Peaks

- Captures 1st and 2nd peaks of measurement.

### Saving Data to USB Flash Drive

- Saves continuous data into USB flash drive at 100Hz. In other words, data can be saved even without PC.



Analyze the Relation of Torque and Angle  
Torque-Angle Analysis Unit TAA series - To page 15

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, ±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) (※3)	

※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 USB flash drive is not included.  
◎No attachments are included.

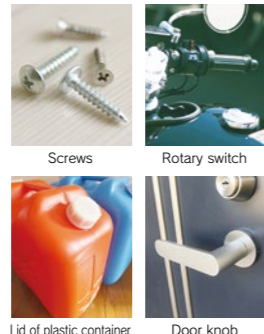
Model	Capacity	Display
<b>HTGS-0.5N</b> (※5)	50N-cm	50.00N-cm
<b>HTGS-2N</b>	2N-m (200N-cm)	2.000N-m (200.0N-cm)
<b>HTGS-5N</b>	5N-m (500N-cm)	5.000N-m (500.0N-cm)
<b>HTGS-10N</b>	10N-m (1000N-cm)	10.00N-m (1000N-cm)
<b>HTGA-0.5N</b> (※5)	50N-cm	50.00N-cm
<b>HTGA-2N</b>	2N-m (200N-cm)	2.000N-m (200.0N-cm)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

※5 The Unit shown in only "N-cm"

## Attachments for HTGS/HTGA

We provide a wide range of interchangeable attachments to fit various testing needs.

### How to Measure



### Pin chuck

Ideal for gripping columnar samples.

Model	HT-DC-13	HT-DC-6.5	HT-DC-6.5SUS(※1)	HT-DC-4
Capacity	5~10N-m(※2)	2~10N-m(※3)	2~10N-m(※3)	0.5~5N-m
Opening width	φ1.2~13mm	φ0.5~6.5mm	φ0.5~6.5mm	φ0.5~4mm
Weight	Approx.600g	Approx.200g	Approx.190g	Approx.100g

※1 HT-DC-6.5SUS (Stainless model) is recommended under easy-to-rust environment.  
 ※2 Cannot be used for 0.5N-m or 2N-m range  
 ※3 Cannot be used for 0.5N-m range

### Torque driver

Ideal for measuring tightening / loosening torque.

Model	HT-DBH	HT-DBH-P
Bit	φ1 φ2 φ3×φ6×45	φ00×50
Weight	Approx.100g	Approx.12g

※ HT-DBH cannot be used for 0.5N-m range.  
 ※ HT-DBH-P cannot be used except 0.5N-m range.

### Socket holder

Ideal for torque wrench or screwdriver bit.

Model	HT-9.5SQ
Socket	9.5mm square
Weight	Approx.100g

※ Cannot be used for 0.5N-m range

### M10 adaptor

This adaptor is used to mount M10 attachment.

Model	HT-AD-M10
Screw	M10×L20
Weight	Approx.50g

※ Cannot be used for 0.5N-m range

### Small table and Pins

Model	HT-ST	HT-ST-01	HT-ST-02
Capacity	2~5N-m	2~5N-m	2~5N-m
Allowable sample diameter	φ7~50mm	φ7~50mm	φ7~50mm
Attached pin	Standard pins	Notch pins	Long clamp pins

※ Cannot be used for 0.5N-m range  
 ※ Image is for illustration purpose. Actual attached pins differ depending on the model.

### Wide table and Pins

Model	HT-STW	HT-STW-01	HT-STW-02
Capacity	2~5N-m	2~5N-m	2~5N-m
Allowable sample diameter	φ10~100mm	φ10~100mm	φ10~100mm
Attached pin	Standard pins	Notch pins	Long clamp pins

※ Cannot be used for 0.5N-m range  
 ※ Image is for illustration purpose. Actual attached pins differ depending on the model.

### Light weight small table and Pins

Model	HT-STL	HT-STL-01	HT-STL-02
Capacity	0.5~2N-m	0.5~2N-m	0.5~2N-m
Allowable sample diameter	φ7~50mm	φ7~50mm	φ7~50mm
Attached pin	Standard pins	Notch pins	Long clamp pins

※ Image is for illustration purpose. Actual attached pins differ depending on the model.

### Light weight wide table and Pins

Model	HT-STLW	HT-STLW-01	HT-STLW-02
Capacity	0.5~2N-m	0.5~2N-m	0.5~2N-m
Allowable sample diameter	φ10~100mm	φ10~100mm	φ10~100mm
Attached pin	Standard pins	Notch pins	Long clamp pins

※ Image is for illustration purpose. Actual attached pins differ depending on the model.

## Accessory

### Sensor holder

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

### Angle Meter Unit AMK-360

• Angle Meter Unit for HTGA series(P08) and eHT Series(P11).  
 • Enables torque-angle measurement.

Model	AMK-360	AMKL-360
Features	Standard	For low torque (0.5 to 2N-m)
Accuracy	±0.2°	
Angle Range	0.1~9999.9°	
Cable Length	Approx. 1m	
Compatible devices	HTGA-2N/5N/10N HTGA-0.5N/2N, eHT-2N/5N/10N eHT-0.5N/2N	

### Rotation Support Jig for HTGS/A

Manual rotation support jig for torque gauge HTGS/A series to measure torque in the horizontal direction

Model	RSH-5N	RSH-5N-EXT	RSH-5N-EXT2	RSH-5N-RA	RSH-5N-RA-EXT	RSH-5N-RA-EXT2
Features	Standard type			With angle-meter		
Capacity	5N-m(500N-cm)					
Maximum depth of a sample (With HT-ST,DT-TB series)	205mm	305mm	405mm	205mm	305mm	405mm
Weight	Approx.5.1kg	Approx.5.5kg	Approx.5.9kg	Approx.5.1kg	Approx.5.5kg	Approx.5.9kg

## Built-in Torque Gauges

# HTGS/HTGA-TFX series



Ideal for integration to equipment by fixing the sensor with its equipped holes on both sides

### HTGS-TFX Standard Type

□Size(The indicator) : Approx.W75XD34XH187mm  
 (The sensor) : Approx. φ35XH28mm  
 □Weight(The indicator) : Approx.490g  
 (The sensor) : Approx.63g

### Accurately / Precisely

It captures torque values accurately due to high sampling rate (2000Hz).

### User friendly

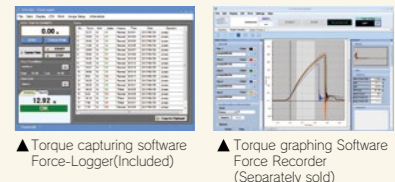
High Luminance Organic EL display  
 Clear organic display has excellent readability.  
 8 languages are available  
 Setting menu in 8 languages helps easy operation.

### Making efficient

OK/NG judgment  
 Picks 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.  
 Connecting to / interlock external equipment

### Easy data management on PC

Easy connection with USB interface  
 Data capturing software Force-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 12 for further information.



### HTGA-TFX High functional type

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

### Inputting/Outputting Angle

By connecting with a customized angle meter, the angle value can be measured and displayed.

### Capturing 2 Peaks

Captures 1st and 2nd peaks of measurement.

### Saving Data to USB Flash Drive

Saves continuous data into USB flash drive at 100Hz.  
 In other words, data can be saved even without PC.

Accuracy	±1.0%F.S. ±1 digit
Unit of measurement	N-m, N-cm, kgf-m, kgf-cm, lbf-in, ozf-in (※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/setting lock/1st/2nd peak (only for HTGA-TFX)/Angle detection at torque peak value (only for HTGA-TFX)(※2)/Angle zero reset at selected torque (only for HTGA-TFX)(※2)
Output	USB/RS232C/±2VDC 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-TFX)/USB flash drive (only for HTGA-TFX)/Angle (only for HTGA-TFX)(※2)
Accessory	AC adapter/inspection certificate/CD driver (including data logging software)/USB cable/carrying case/L wrench/USB flash drive adapter (only for HTGA-TFX)(※3)

※1 These are the specifications for international model. Note that available units are different from Japanese domestic model.  
 ※2 Angle meter is necessary to activate these functions.  
 ※3 USB flash drive is not included.

Model	Capacity	Display
HTGS-TFX-5N	5N-m(500N-cm)	5.000N-m(500.0N-cm)
HTGS-TFX-10N	10N-m(1000N-cm)	10.00N-m(1000N-cm)
HTGA-TFX-5N	5N-m(500N-cm)	5.000N-m(500.0N-cm)
HTGA-TFX-10N	10N-m(1000N-cm)	10.00N-m(1000N-cm)

## Torque Meter for Motor Screw Drivers and Torque Drivers

# I-8/I-80

Torque of a motor screw driver and torque driver can be easily measured. It is ideal for daily torque maintenance.



Model	I-8	I-80
Measuring range	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 (Selecting 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.

### (For Driver Adapter OW Series)

Model	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



## eZ-Connect series are...

- eZ-Connect is composed of an amplifier and load cells. Load cells can be replaced 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.
  - 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).

### [This is recommended in these cases below]

- Measure both low-load torque and high-load torque.
- Perform different types of tests such as tension and torque.
- Keep a spare load cell to reduce risks in operation.

### 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**

## Sensor Interchangeable Amplifier eZT

- Precise**
    - Captures 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



## Desktop Amplifier FA Plus2 series

- Its box-shaped design is ideal for integration into facilities.
  - Its rich output functions allow easy connection to external devices such as PLC.
- Size: W151×D150×H90mm  
 □Weight: Approx. 1.1kg



**Check Force / Torque Transition on Graphs**  
 Software Force Recorder ———— To Page 12

**Transmit Data Wirelessly**  
 Wireless Unit WL01-ADP/WL01-USB ———— To Page 13

**Connect with External Devices**  
 Cable Using Applications ———— To Page 13

For Torque(only for eZ connect)		For Torque(only for eZ connect)		For Compression and Tension(only for eZ connect)		
<b>Torque Load Cell eHT series</b> It measures turning/twisting force.		<b>Flange type Torque load Cell eTFX</b> It measures turning/twisting force.		<b>Standard Type eDPU</b> Easy built-in shape to external equipment		
It measures torque using optional attachments such as pin chuck, socket holder, torque driver etc.(Page 09)		Ideal for integration to equipment by fixing it with its equipped through holes on both sides.		It measures force by mounting an attachment on the thread (the male screw part).		
Capacity	0.5N-m~10N-m	Capacity	5N-m~10N-m	Capacity	2N~500N	
Accuracy	±0.5% F.S. or less	Accuracy	±1.0%F.S. or less	Accuracy	±0.2%F.S. or less	
Size	φ38×138mm	Size	Approx. φ35×28mm	Size	Approx.W58×D21×H71~W72×D21×H73mm	
Cable length	Approx.0.5~1m (curl cable)	Cable length	Approx.2m	Cable Length	Approx.2m	
Model	Capacity	Model	Capacity	Model	Capacity	Thread
eHT-0.5N	50N-cm(※)	eTFX-5N	5N-m(500N-cm)	eDPU-2N	2N	Male Screw M3P1.0
eHT-2N	2N-m(200N-cm)	eTFX-10N	10N-m(1000N-cm)	eDPU-5N	5N	
eHT-5N	5N-m(500N-cm)			eDPU-10N	10N	
eHT-10N	10N-m(1000N-cm)			eDPU-20N	20N	
				eDPU-50N	50N	
				eDPU-100N	100N	
				eDPU-200N	200N	
				eDPU-500N	500N	

※Displayed unit is "N-cm" only.

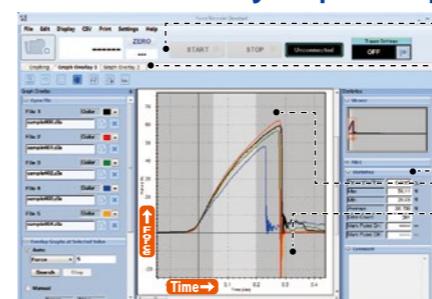
○eZ-Connect series can be combined with various load cells. Please see "Force Gauges & Associated Equipment catalog" for the details of load cells available.

# Data Analysis Software Force Recorder series

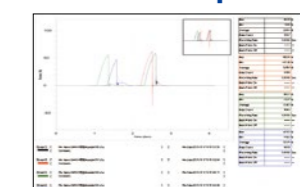
Analyze data easily and accurately, and create report with ease

We offer 3 types(Light/Standard/Professional)to fit your needs.

- Make efficient by simple manipulations and useful functions.
- Create reports quickly



- Easy steps for saving. Connect a force gauge and PC with a USB cable, and click START.
- Compares 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)
- Graphs the measurement accurately with high sampling rate up to 2000 Hz

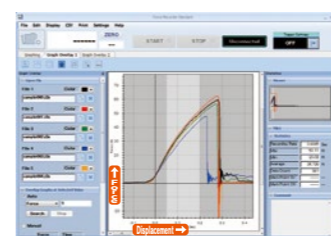


- Data can be easily saved in Word, Excel, and PDF format, reducing the time to create reports.
- It automatically inputs graphs, date & time, and statistics. Comments also can be input manually if necessary.

## Force Recorder Professional

Torque-angle graphs can be drawn precisely at Max. 2000Hz with ease.

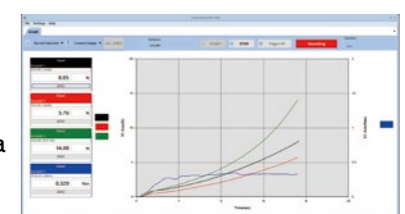
- For angle data acquisition, you need an angle meter in addition to DTXA/HTGA/HTGA-TFX/eHT (eZT).
- TAA series (Page 15) come with this software.



## Force Recorder Plus

Graphs the data acquired from up to 4 force gauge/torque gauge at the same time

- Acquire continuous data (up to 1000 times/sec)
- Display different unit such as force and torque in 1 screen



# Multiple Gauges Managing Software Force Logger Plus

Manages data up 4 force/torque gauges



### Comparison Table Function Comparison

Software	Force Recorder Light	Force Recorder Standard	Force Recorder Professional	Force Recorder Plus	Force Logger Plus
Feature	Graphing only	With editing functions	Force-displacement graphing	Graphing for multiple force gauges at the same time	Connect up to max. 4 force gauges
Graph	Force-time	Force-time	Force-time; Force-displacement	Force-time	N/A
Data transferring speed (Max)	2000 data/sec	2000 data/sec	2000 data/sec	1000 data/sec	10 data/sec
Recording data point (Max)	7.2 million	7.2 million	7.2 million	3 million	65 thousand
Displacement output	N/A	N/A	✓	N/A	N/A
Graph overlaying function	N/A	✓(Max.5graphs)	✓(Max.5graphs)	✓(Max.10graphs)	N/A
Trigger function	N/A	✓	✓	✓	N/A
Point marking	N/A	✓	✓	N/A	N/A
Border line function	N/A	✓	✓	N/A	N/A
Capture function	N/A	✓	✓	✓	N/A
Graph scaling	✓(Auto)	✓(Auto)	✓(Auto)	✓(Auto/Manual)	N/A
Statistics output	✓	✓	✓	✓	✓
Comment	✓	✓	✓	N/A	N/A
Print	✓	✓	✓	✓	✓
CSV file converting	✓	✓	✓	✓	✓
Preview saving (PDF/Word/Excel)	✓	✓	✓	✓	N/A
Force gauge setting	✓	✓	✓	✓	✓
Managing force gauge	N/A	N/A	N/A	✓	✓

※Old models of force gauges may not be compatible partially or wholly. Contact us for the detail about old models.

### Operating Environment for Force Recorder series, Force Logger Plus, Force Recorder Plus (Operating Environment)

Model	Force Recorder Light/Standard/Professional	Force Recorder Plus	Force Logger Plus
OS	Windows 8.1 / 10 / 11	Windows 8.1 / 10 / 11	Windows 8.1 / 10 / 11
Hardware	CPU: 1GHz or higher/Memory: 2GB or more Hard disk: 10GB(Data storage area) more	CPU: 1GHz or higher/Memory: 4GB or more Hard disk: 10GB(Data storage area) more	CPU: 1GHz or higher/Memory: 2GB or more Hard disk: 10GB(Data storage area) more
Plat form	.NET Framework 4.8 later	.NET Framework 4.8 later	.NET Framework 4.8 later
Image size	Resolution: 1024×768 pixel more	Resolution: 1920×1080 pixel more	Resolution: 1280×768 pixel more

# Cables

Cables expand the functionality of torque gauges.

	HTGS/HTGA	HTGS/HTGA-TFX	DTXS/DTXA	eZT	eFA Plus2
<b>The cables to connect a torque gauge to an external device</b>					
<b>RS232C cable</b> Connects a PC to a torque gauge, enabling to record the measurement and transmit command signals from the PC to the gauge.	<b>CB-208</b> (9-pin) Length: Approx. 3m	<b>CB-208</b> (9-pin) Length: Approx. 3m	<b>CB-208</b> (9-pin) Length: Approx. 3m	<b>CB-208</b> (9-pin) Length: Approx. 3m	<b>CB-208</b> (9-pin) Length: Approx. 3m
<b>Analog cable</b> Connects analog devices such as a pen recorder to a torque gauge, enabling to record torque transition. CB-118 works for "-AN" option. ※1	<b>CB-108</b> Length: Approx. 3m	<b>CB-108</b> Length: Approx. 3m	<b>CB-108</b> Length: Approx. 3m	<b>CB-108</b> Length: Approx. 3m	<b>CB-108</b> Length: Approx. 3m
<b>Open End cable</b> Connects a torque gauge to a special device.	<b>CB-908</b> Length: Approx. 3m	<b>CB-908</b> Length: Approx. 3m	<b>CB-908</b> Length: Approx. 3m	<b>CB-908</b> Length: Approx. 3m	<b>CB-908</b> Length: Approx. 3m
<b>Cable with Terminal Block</b> Connects an external equipment such as PLC	<b>CTB-A</b> Length: Approx. 1m	<b>CTB-A</b> Length: Approx. 1m	<b>CTB-A</b> Length: Approx. 1m	<b>CTB-A</b> Length: Approx. 1m	<b>CTB-A</b> Length: Approx. 1m
<b>External Contact Point cable</b> Enables to measure external contact points.	<b>CB-808</b> Length: Approx. 3m	<b>CB-808</b> Length: Approx. 3m	<b>CB-808</b> Length: Approx. 3m	<b>CB-808</b> Length: Approx. 3m	<b>CB-808</b> Length: Approx. 3m

※1 ZTS/A series force gauges output raw sensor data as fast analog voltage without conversion with -AN option.  
 ※2 We offer customization including the length extension, connector's change in shape, and more.  
 ※ CB-308 are required to connect Mitutoyo Digimatic Mini Processor to HTGS/A series (earlier than Ver.5.00).

## Wireless Data Transmit System WL01-ADP/ WL01-USB

Transmits acquired measurement data to the device such as PCs wirelessly.

- Accurate data transmission/reception: "Group Name" settings and reception detection function which detects transmission errors
- High security data protection: Protect data leak with AES data encryption
- Various types of data management: By publishing communication formats, this single USB Wireless Receiver (WL01-USB) can receive up to 26 data of force gauge, and can use with your own software ※1



Wireless Transmit Adapter	
Adapter which connected to force gauge to send data	
Model	<b>WL01-ADP</b>
Compatible Models ※2	ZTA/ZTS (Separated Sensor Models Included), eZT, FA Plus2, eFA Plus2, DTXA/DTXS, HTGA/HTGS, HTGA/HTGS-TFX
Communication Distance ※4	Approx. 20m
Wireless Communication Standard / Frequency	Complies with IEEE802.15.4 World Common Frequency: 2.4GHz Complies with CE: Radio Equipment Directive [2014/53/EU] Complies with Japanese Technical Standard: ARIB STD-T66 ※Please contact us for use in other available areas

USB Wireless Receiver	
Receiver which connected to PC to receive data	
Model	<b>WL01-USB</b>
Compatible Software ※3	Force Logger (Attachment, available from the Ver. 2.10 later) Force Logger Plus (Sold Separately, available from Ver. 1.10 later)
Communication Distance ※4	Approx. 20m
Wireless Communication Standard / Frequency	Complies with IEEE802.15.4 World Common Frequency: 2.4GHz Complies with CE: Radio Equipment Directive [2014/53/EU] Complies with Japanese Technical Standard: ARIB STD-T66 ※Please contact us for use in other available areas

※1 In the case of using the output signal by connecting force gauge to a test stand or external device while using wireless communication, Wireless Transmit BOX (WL01-BOX) is available.  
 ※2 Depending on the software used, the number of connectable devices is limited.  
 ※3 All compatible models are available from firmware Ver.3.10 and later.  
 ※4 Maximum connected number of IMADA software Force Logger: 1 unit / Force Logger Plus: 4 unit  
 In the case of using Wireless Data Transmission System Unit with IMADA software, some restrictions are on software function. Please contact us for the details. E.g. Acquire continuous data  
 ※4 The communication distance may vary depending on the obstacles and environmental conditions. Please contact us for the details.

## The Cables for Old Models

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

### [The Model List]

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

## Test Stands for Torque Testers

Combine this test stand with a DTXS/DTXA for greater accuracy. This test stand provides constant test speed due to automatic operation, and guarantees highly repeatable test result.

# MTS series

### Precisely

- High repeatability with constant test speed

### Easily

- Easy and digital speed-setting
- Auto operation by a set torque

### Efficiently

- Automatic stop at a set torque value
- Durability test with a set repeat count
- Automated data recording, interlocked with software (An optional software is required to operate it.)



**Check torque transition on graphs**  
 Software Force Recorder ————— To Page 12



**Analyze the Relation of Torque and Angle**  
 Torque-Angle Analysis Unit TAA series — To Page 15



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		
Accessory	Power cable, Torque gauge connecting cable (※2), 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 Change
- ※1 Torque gauge should be connected with the cable (included).  
 ※2 Standard model comes with CB-528. -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



Model: **MT-TB**  
 Max. torque: 10N-m  
 Sample diameter: φ 20~90mm

#### Small chuck (※1)



Model: **MT-ST** (※1)  
 Max. torque: 5N-m  
 Sample diameter: φ 7~50mm

#### Pin chuck



Max. torque: 10N-m

Model	Diameter
<b>MT-DC-13</b>	Large φ 1.2~13mm
<b>MT-DC-6.5</b>	Medium φ 0.5~6.5mm
<b>MT-DC-6.5SUS</b>	Medium (Stainless) φ 0.5~6.5mm (※2)

Max. torque: 5N-m

Model	Diameter
<b>MT-DC-4</b>	Small φ 0.5~4mm

#### M10 adaptor



Model: **MT-AD-M10**  
 It helps you to 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 05 of "Attachments for DTXS/DTXA"  
 ※2 MT-DC-6.5sus (stainless model) is recommended under easy-to-rust environment.



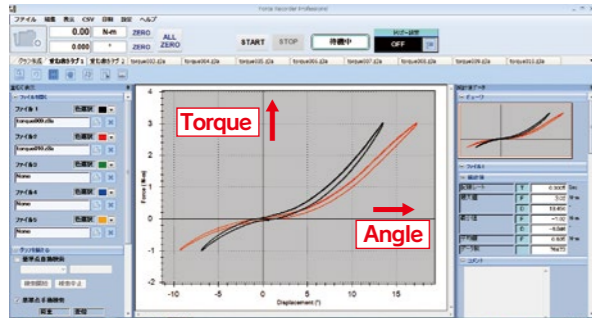
# TAA series Torque-Angle Analysis Unit

This unit enables you to easily analyze the relation between torque and angle.

TAA series 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)

## Configuration

### TAA-MTS-TB Series

This is a desktop type offering automatic rotation at set speed.

#### A Torque Stand

Upper side rotates at a set speed. Test requirements such as a starting speed, a returning speed, pause at set torque value, and more can be set up.

#### A Connection Cable

It connects a torque tester with a torque stand for control.

#### Included Attachments

It comes with 2 attachments; MT-TB for upper side, and DT-TB for lower side. Other optional attachments can be replaced instead to fit your test samples.

#### A Torque Measurement Instrument

It displays torque and angle. It can be taken on/off by screws when required.



#### Software

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

### TAA-HTG Series

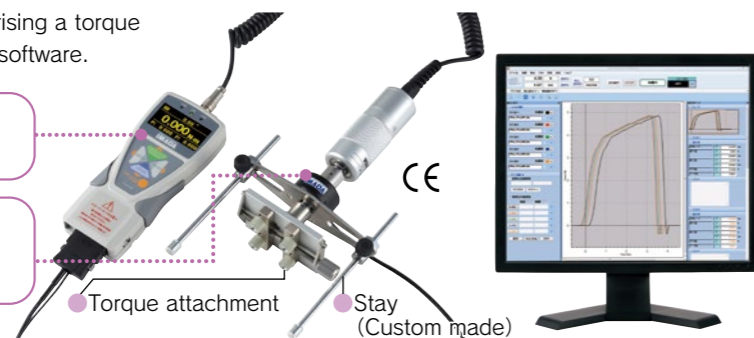
This is handheld type, comprising a torque gauge, an angle meter, and software.

#### Torque Gauge

It displays torque and angle.

#### Angle Meter Unit

It measures the angle and output to torque gauge.



※ An optional torque attachment and an optional stay(custom-made)are required to complete the testing system but they are not included. Contact us for further information of the chuck and the stay.

### [Specifications for Torque-Angle Analysis Unit TAA series]

Model		TAA-MTS-□□N-TB (※1)	TAA-HTG-□□N (※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)	0.1° (on Force Recorder Professional) 0.1° (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 range of sample's height other than above-mentioned height. ※Please use extension shaft(page 12) 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 (approx. 6.5 hours for using, approx. 2 hours for re-charging)	
	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-72B), USB cable, Spare fuse, Instruction manual, Inspection certificate, tool, packing cardboard box.	Handle (only for 10N-m range)
Included attachments(※3)		Lower side: DT-TB (refer to 04), Upper side: MT-TB (refer to P12)	—

※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 A torque gauge is needed to connect 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.

### Examples of TAA-HTG Series Application

This is a handheld and manual-twist type, which allows torque-angle analysis even in environments where a large device cannot be brought in.

#### Turning the door-knobs

Turning test which analyze the relationship between the Max. force value and the angle.



#### Turing dials of the air conditioner and audio systems

Operability test which analyze the relationship between the resistance of click feeling and the angle of turning.



#### Other Examples

- Ease of key turning
- Operability of a motorcycle's accelerator
- Operabilities of a dial and a switch

### Examples of TAA-MTS-TB Series Application

This is a desk top type, offering highly repeatable measurement by automatic rotation at constant speed.

#### Opening the bottle caps

Opening tests for the bottle caps to analyze the relationship between the resistances of clicking feeling and the angle.



#### Twisting durability tests for the PCB and nonwoven fabrics

Durability test for twisting the PCB for a set number of repetitions at a constant load value.



#### Other Examples

- Tactile of rotary switch
- Twist characteristics of underwear and a sanitary pads
- Sliding resistance of a camera-lens ring

### Example of TAA-HTG Series Application

#### ●Measurement by Handle Operation

How to measure:

1.Set your sample on the fixed sensor

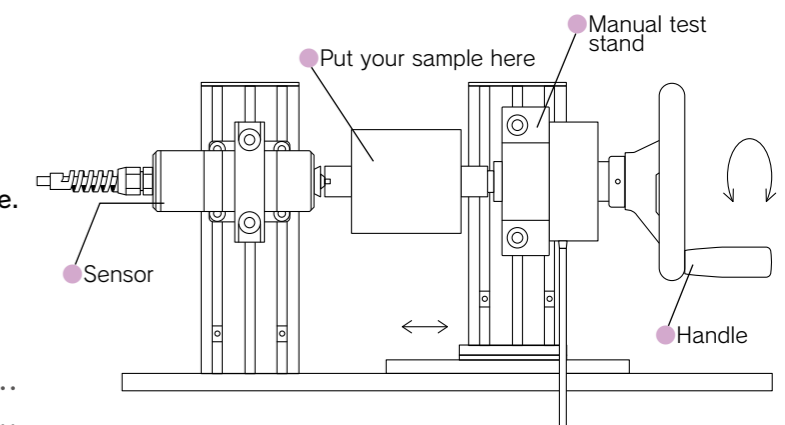
2.Rotate the handle

A torque vs angle graph can be drawn precisely with ease.

For example...

- torsion spring
- a rotary switch etc.

Please contact us for further information.



# Food Texture Analyzer & Related

IMADA texture analyzers realize stable product quality management by quantifying food characters such as hardness or stickiness which used to be defined by artisans.

These devices are also suitable for measurement of packaging materials to design safe and easy-to-use food packages.



## Food Texture analysis



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



### at a Cooking Step (Elasticity / Texture)

Available for measurement complying with standards

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

#### Texture Analyzer

FRTS ————— To page 18

#### Simple food texture analyzer

FCA ————— To page 21

## Packaging Strength/opening tests



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



#### Bottle cap opening testers

DTXS/DTXA series — To page 05

#### 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

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

## FRTS series

### Excellent Operability

- User friendly touch screen enables you to operate intuitively.
- Testing requirement can be setup very easily.
- Maximum 6 testing conditions can be added to "Favorites" to recall them quickly.

### Great Precision

- High accuracy:  $\pm 0.2\%F.S. \pm 1$ digit
- Capture peak value accurately due to high sampling rate (1000Hz).
- Testing conditions can be saved and recalled to uniformize testing condition.

### Varieties of Textures Can Be Measured

- A wide range of attachments is available.



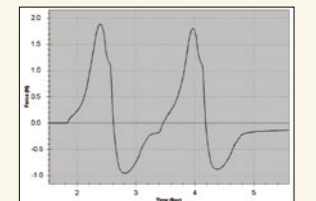
◀ A recommended attachment is indicated when you choose preset measuring method.

### Easy Care

- The measuring part can be easily cleaned up since it is made of stainless.
- The tray can be readily detached.

### Easy Data Management and Analysis

- The data can be stored to include USB flash drive.
- A graph can be drawn on PC with using included software.
- Load distributions can be confirmed, and compared very easily.



▲USB flash drive (Included)

▲Graphing software (Included)

#### [Specifications for FRTS series]

Accuracy	Force	$\pm 0.2\%F.S. \pm 1$ digit
	Displacement	0.1mm $\pm 1$ 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), FR-HN (screw for mounting lower tension attachments), FR-JS-50/100 (2 type shafts for mounting upper attachments), Fuse, 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 PC is required for measurement to comply with some standards.  
 ※4 Not able to prevent overload in some cases.  
 ※5 Not able to use this product under a vibratile environment.

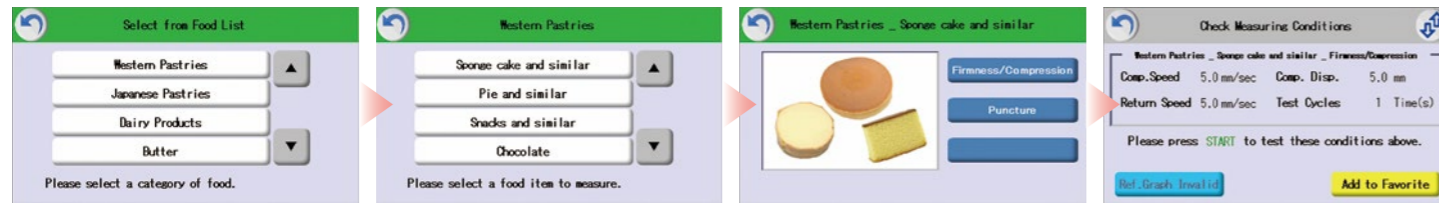
#### [Model]

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

# 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;
  - Use preset testing conditions without any changes.
  - Use preset conditions with some changes.



## Food categories in pre-installed "Food List" & samples

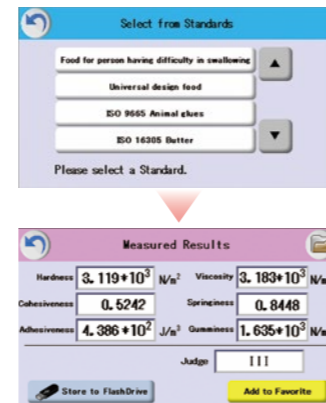
Sweets	Japanese sweets	Dairy products	Butter	Noodles	Bread	Rice	Meat
Cake, Pie Jelly, Snack	Manju Rice cracker	Cheese Yoghurt	Butter	Boiled noodles Noodle dough	Bread, Donut Kneaded dough	Uncooled rice Cooked rice	Raw meat Cooked meat
Fish and seafood	Paste	Beans	Nuts	Eggs	Vegetables	Mushrooms	Fruits
Cooked fish Raw fish	Fish sausage Paste	Cooked bean Tofu	Peanut	Egg shell, Raw egg Boiled egg	Carrot, Cucumber Pepper, Potato	Mushrooms	Apple, Grape, Jam

\* We can add 1 program according to your request (some measuring conditions are not acceptable). Please make sure to tell us before you order (Free of charge up to 1 program).

## 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)

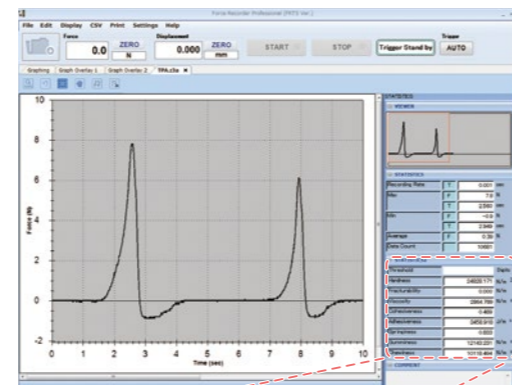


## Set measuring conditions by yourself

### Measuring conditions such as displacement, test speed, number of tests can be set by yourself.

## Included Software

- FRTS can be connected 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, graphs can be overlaid for detailed analysis.



### (Software operating environment) \*FRTS series

Operating environment	Windows 8.1 / 10 / 11
Hardware	CPU: 1GHz or higher/Memory: 2GB or more Hard disk: 10GB(Data storage area) more
Platform	.NET Framework 4.8 later

STATISTICS2	
Threshold	24828.171 Digits
Hardness	2864.799 N/m <sup>2</sup>
Fracturability	0.000 N/m
Viscosity	2864.799 N/m <sup>2</sup>
Cohesiveness	0.489
Adhesiveness	3458.918 J/m <sup>3</sup>
Springiness	0.833
Gumminess	12143.231 N/m <sup>3</sup>
Chewiness	10118.494 N/m <sup>3</sup>

# 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.

Please select the specified dimensions for □, and J or S for ● to order. J: Resin, S: Stainless

Compression	<b>Disk probe</b> Model:FR-HA-[D] □ ※1 <table border="1"> <tr><th>D</th><th>●</th></tr> <tr><td>20</td><td>J,S</td></tr> <tr><td>30</td><td>J</td></tr> <tr><td>50</td><td>J</td></tr> </table>	D	●	20	J,S	30	J	50	J	<b>Cylindrical probe</b> Model:FR-EC-[D] □ ※1 <table border="1"> <tr><th>D</th><th>●</th></tr> <tr><td>3</td><td>J,S</td></tr> <tr><td>5</td><td>J,S</td></tr> <tr><td>8</td><td>J</td></tr> <tr><td>10</td><td>J</td></tr> <tr><td>12.7</td><td>J</td></tr> <tr><td>15</td><td>J</td></tr> </table>	D	●	3	J,S	5	J,S	8	J	10	J	12.7	J	15	J	<b>Conical probe</b> Model:FR-ES-[θ]-[D] □ ※1 <table border="1"> <tr><th>θ</th><th>D</th><th>●</th></tr> <tr><td rowspan="2">45</td><td>20</td><td>J</td></tr> <tr><td>30</td><td>J</td></tr> <tr><td rowspan="2">60</td><td>20</td><td>S</td></tr> <tr><td>30</td><td>J</td></tr> </table>	θ	D	●	45	20	J	30	J	60	20	S	30	J	<b>Sphere probe</b> Model:FR-SR-[D] □ ※1 <table border="1"> <tr><th>D</th><th>●</th></tr> <tr><td>5</td><td></td></tr> <tr><td>7</td><td></td></tr> <tr><td>10</td><td></td></tr> <tr><td>20</td><td></td></tr> </table>	D	●	5		7		10		20	
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Tension	<b>Yogurt cutter</b> Model:FR-YN-29 Stainless	<b>Vice pin for sticking</b> Model:FR-CP-3 Pin: Stainless Pin Vice: Steel ※3	<b>3 point bending fixture</b> Model:FR-TP-60 Aluminium ※3																																														
	<b>Special grip for noodle</b> Model:FR-NP-25 Stainless ※3	<b>Small grip</b> Model:FR-SC-3 Aluminium ※3	<b>Film grip (small)</b> Model:FR-FC-21 20 Aluminium ※3	<b>Film grip (large)</b> Model:FR-FC-41 40 Aluminium ※3																																													
Shearing	<b>Cutter</b> Model:FR-NB-80 Stainless ※3	<b>Wire-cutter</b> Model:FR-WK-85 Piano wire: Stainless	<b>Wedge probe</b> Model:FR-KS-[θ]-[D]-20 30 □ ※1 <table border="1"> <tr><th>θ</th><th>●</th></tr> <tr><td>45</td><td>J,S</td></tr> <tr><td>60</td><td>J,S</td></tr> </table>		θ	●	45	J,S	60	J,S																																							
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Optional table	<b>Wide table</b> Model:FR-LT-120 120 Stainless	<b>Center lined table</b> Model:FR-CT-80 Stainless	<b>Table with trench</b> Model:FR-GT-[W] □ ※1 <table border="1"> <tr><th>W</th></tr> <tr><td>3</td></tr> <tr><td>5</td></tr> <tr><td>10</td></tr> </table> Stainless	W	3	5	10	<b>Container holder table</b> Model:FR-BG-60 Stainless ※3																																									
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<b>Sample holder table</b> Model:FR-UP-[D] □ ※1 <table border="1"> <tr><th>D</th></tr> <tr><td>5</td></tr> <tr><td>10</td></tr> <tr><td>25</td></tr> <tr><td>50</td></tr> </table> Aluminium ※3	D	5	10	25	50	<b>Stick guide plate</b> Model:FR-KP-[D] □ ※1 ※2 <table border="1"> <tr><th>D</th></tr> <tr><td>3</td></tr> <tr><td>5</td></tr> <tr><td>10</td></tr> </table> Polycarbonate ※3	D	3	5	10	<b>Stick holder</b> Model:FR-ST-25 25 Aluminium ※3	<b>Anti-Scattering sheet</b> Model:FR-DP-80 Polycarbonate ※3																																					
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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 Only FR-ES60-20S is stainless steel conical probe. ※2 Attachments for tension test is available only for Manual mode of FRTS series. ※3 The material of main part. Screw part probably has different material.

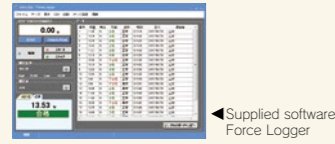
Torque Testers

Torque Testers

Testers for Food Industries

# FCA-DSV-50N

Travel distance can be adjusted to move a force gauge and easily measure firmness or force to crush food. Moreover, data can be easily managed using a supplied software.



Supplied software Force Logger

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-DSV-50N-1	FCA-DSV-50N-2
Capacity	50N	
Display	50.00	
Accuracy	± 0.2% F.S. ± 1 digit	
Unit	N,kgf,lbf ※1	
Stroke	0 to 45 mm (Adjustable with the limit knob)	
Maximum Space	50 to 80 mm ※2	
Overload	Approx. 200% F.S.	
Power	Nickel-Metal Hydride battery (NiMH battery), USB charge(AC adaptor)	
Operating Environment	Temperature: 0 to +40 degree Celsius / Humidity: 20 to 80% RH	
Functions	Peak hold(Tensile or compression)/Comparator(OK Judgement)/Sensitivity(3 steps)/Sign inversion/Setting lock/Date & Time/Off timer (Auto power-off)/Reminder for calibration schedule/Overload alarm/Tilt-sensing alarm/Continuity peak mode/Internal memory (1000 point)	
Output	USB/RS232C	
Overload alarm	Previous warning: It alarms if the force exceeding up to 90% of capacity is applied. Overloading alarm: It alarms and the overload sign is indicated if the force exceeding 110% of capacity is applied.	
Weight	Approx. 3kg	
Dimensions	Approx. W175×D178×H296mm	



Unit	Force gauge DSV-50N-M4 (※3)	Lever type test stand FCA-50N	Others (Manual, mounting screws, tool, inspection certificate)
Supplied attachment	Disk probe		Wedge probe
Accessories	Force Logger(Data logging Software)/USB cable/AC adaptor/Carrying case/Instruction manual/Inspection certificate		

※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 DSV series. It carries M4 measuring thread for FCA.

IMADA offers the force measurement solution not only in Japan but also in many countries and regions around the world.

Europe	Asia	America
<ul style="list-style-type: none"> <li>● France</li> <li>● Germany</li> <li>● Hungary</li> <li>● Ireland</li> <li>● Italy</li> <li>● Poland</li> <li>● Spain</li> <li>● Turkey</li> <li>● England</li> <li>● Slovenia</li> <li>● Denmark</li> <li>● Netherlands</li> <li>● Sweden</li> <li>● Bulgaria</li> </ul>	<ul style="list-style-type: none"> <li>● Lithuania</li> <li>● Latvia</li> <li>● Bosnia</li> <li>● Macedonia</li> <li>● Estonia</li> <li>● Serbia</li> <li>● Romania</li> <li>● Austria</li> <li>● Switzerland</li> <li>● Portugal</li> <li>● Czech Republic</li> <li>● Luxembourg</li> <li>● Belgium</li> <li>● Other Europes</li> </ul>	<ul style="list-style-type: none"> <li>● China</li> <li>● Hong Kong</li> <li>● Taiwan</li> <li>● South Korea</li> <li>● Thailand</li> <li>● Indonesia</li> <li>● Malaysia</li> <li>● Singapore</li> <li>● The Philippines</li> <li>● Vietnam</li> <li>● India</li> <li>● Pakistan</li> <li>● Other Asias</li> </ul>

Africa	Middle East	Oceania
<ul style="list-style-type: none"> <li>● South Africa</li> <li>● Egypt</li> <li>● Morocco</li> <li>● Tunisia</li> <li>● Algeria</li> <li>● North Africa</li> <li>● Other Africas</li> </ul>	<ul style="list-style-type: none"> <li>● Israel</li> <li>● UAE</li> <li>● Kuwait</li> <li>● Saudi Arabia</li> <li>● Oman</li> <li>● Jordan</li> <li>● Qatar</li> <li>● Other Middle</li> <li>● East Asias</li> </ul>	<ul style="list-style-type: none"> <li>● Australia</li> <li>● New Zealand</li> <li>● Other Oceanias</li> </ul>



※If you have any inquiries regarding the sales area, please contact us.