Minebea

Specifications

TgAnest

Spec. No. EN4990-001F 1/22

Data processing software for TGI/TGE/TG/TGJ series

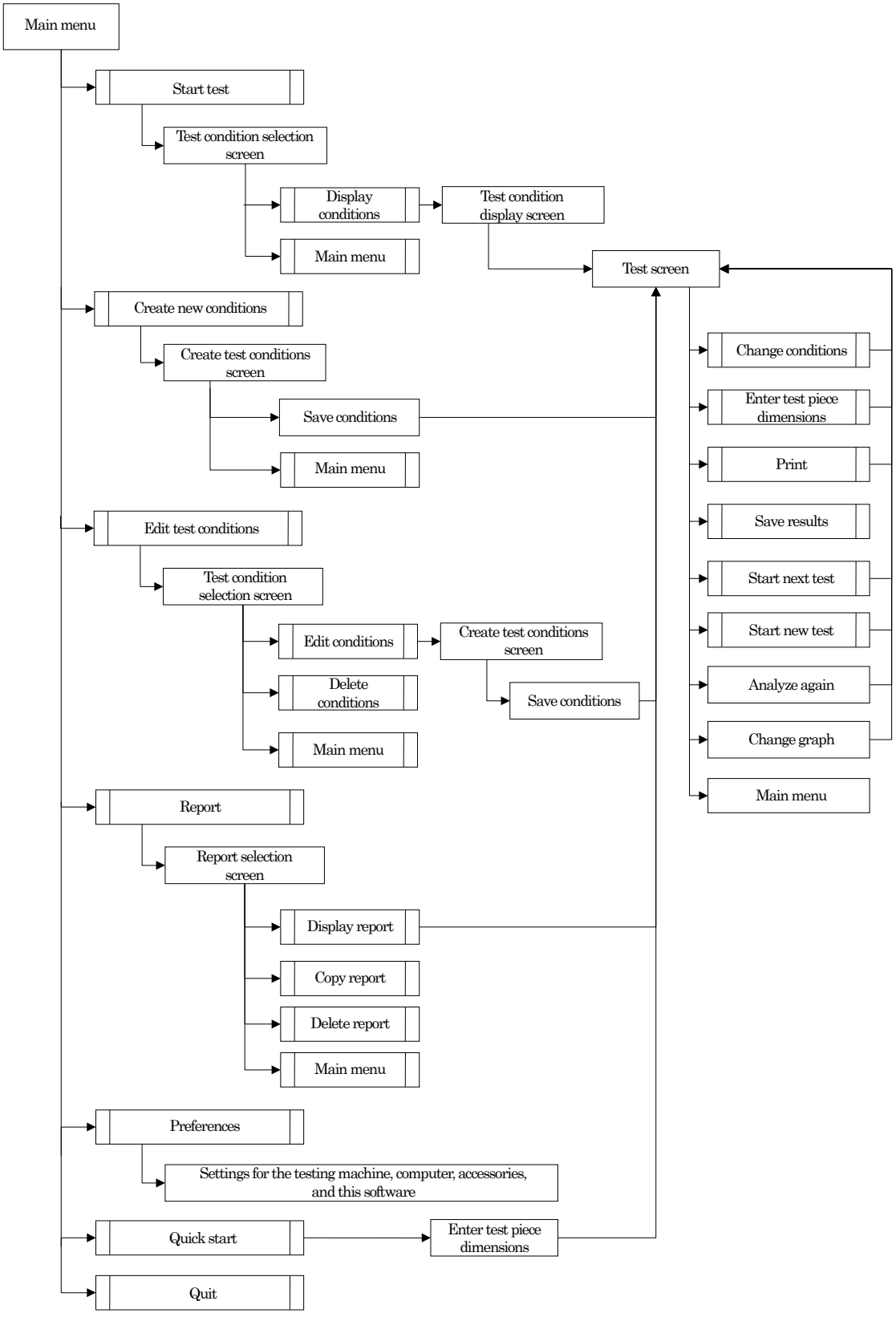
1. Overview

Used with TGI series, TGE series or TG series tensile and compression testing machines, the software enables efficient static strength testing in single tests, cyclical tests, or controlled (customized) tests. Acquired data can be graphed, analyzed in various ways, and the results printed or saved in various file formats.

- Even complex test conditions can be created easily.
- Configuration of analysis items is simplified by easy-to-understand illustrations.
- Information is displayed using large, easy-to-read fonts.
- Test screen windows can be resized and shown/hidden as needed.
- Test result reports can be printed or saved as PDFs.
- The design of test result reports can be customized to output reports in a variety of formats.
- Test results can be reanalyzed any number of times under different conditions or with different analysis items.
  Because new testing is not required, the software is environmentally conscious and helps users avoid wasting test pieces.
- Security functions prevent accidental deletion of test results and user-created conditions.
- Additional tests can be performed and the test order rearranged as needed.
- Analysis results can be output in both SI and MKS units at the same time.

Data processing software for TGI/TGE/TG/TGJ series

2. Software Hierarchy Diagram



Data processing software for TGI/TGE/TG/TGJ series

3. Hardware Specifications

Personal computer

OS:	Windows® 7, Windows® 10
CPU:	Intel® Pentium® processor, clock speed 2 GHz or faster
Minimum memory:	2 GB or higher
Hard disk:	1 GB or more of free space
CD-ROM drive:	Required for installation
Available serial ports:	TGE, TGI, and TG test machines require one when using the serial port. Cannot be used with TGJ testing machines.
Available USB ports:	For TGE, TGI, and TG testing machines, one is required for communication using a USB cable. Required for TGJ testing machines.
Available PCI slots:	Up to two (Not required unless an LEE type displacement transducer is used or external input functions are used.) Counter board (when an LEE type displacement transducer is used): Contec CNT-3208M-PE (PCI Express) Analog input board (when external input functions are used): Contec AIO-160802L-LPE (PCI Express)
Minimum resolution:	1280 × 768 or higher
.NET Framework	4.6 or higher

* This software doesn't guarantee the operation with all PC.

4. Function Specifications

4-1. Types of Tests

Test Mode	Type of Test
Single	Tension, compression, 3-/4-point bending, peel, creep, auto load, Flexible Correction * Test speed and sampling is adjustable within four levels. Does not apply to creep, auto load, and Flexible Correction.
Cycle	Tension, compression, 3-/4-point bending * Can pause at return point (up to 999 seconds).
Control	Tension, compression, 3-/4-point bending, creep, relaxation, auto load, Flexible Correction

* Control: Create up to 20 control parameters for the testing machine to follow.
* Single, Cycle, and Control must be purchased separately.

Data processing software for TGI/TGE/TG/TGJ series

4-2. Preload

Load can be applied to the test piece before testing begins.

Type of Preliminary Load	Description
Automatic cancellation	Control the testing machine to eliminate testing force before testing.
Preload cycle	Apply load at the specified return point, for the specified number of times.
Off	Do not apply load in advance.

* [Automatic cancellation] is not available with [TG] or [TGJ] model.

4-3. Origin Detection

Calculates height data from a reference plane during compression testing.

Safely, precisely, and rapidly calculates height. (Requires special jig.)

4-4. Maximum Tests

4-4-1. Single, Control

Up to 100 batch and 100 sub-batch tests can be specified.

4-4-2. Cycle

One batch test can be specified, without any sub-batch tests.

4-5. Sampling

Specify the time or position value. Can be set in up to four levels.

4-5-1. Time

Specify a time between 10 ms and 10 hours, in 10 ms increments.

* The minimum time is 30 ms when using a USB cable.
* The minimum time is 50 ms when using with TG series.

4-5-2. Position Value

Type of Testing Machine	Input Range
TGI series	Set in a range of 0.001 to 1999.999 mm, in 0.001 mm increments.
TGE/TG/TGJ series	Set in a range of 0.01 to 1999.99 mm, in 0.01 mm increments.

4-6. High-Speed Sampling

Can be set in up to three levels: 1, 5, 10, 50, 100, or 150 ms.

* High-speed sampling requires optional RS-232C connectivity on the testing machine.
* The minimum sampling is 1.25 ms when using with TG or TGJ series.

4-7. Test Speed

Testing is possible with the test speed set to [Position speed],[Test force speed],[Stress speed] or [Strain speed].

* Position speed: unit of speed displayed as mm/min
* Test force speed: unit of speed displayed as N/min
* Stress speed: unit of speed displayed as MPa/sec.
* Strain speed: unit of speed displayed as %/sec.
* Only [Position speed] is available for cycle testing.
* Only [Position speed] is available for Flexible Correction.

Data processing software for TGI/TGE/TG/TGJ series

4-8. Sensor Display

Up to 16 sensor values can be displayed during testing.

Sensors to display can be selected as desired, as can the measurement unit.

Sampling data from displayed sensors can be saved as a file.

4-9. Analysis Items

4-9-1. Single, Control

The following analysis item units can be calculated.

*[Displacement transducer] and [Displacement transducer (strain)] are only available when using a displacement transducer.

Type	Units
Testing force	mN, cN, N, kN, gf, kgf, tf
Stress	[Other than threads] Unit of testing force/mm^2, unit of testing force/cm^2, unit of testing force/m^2, and Pa, kPa, MPa, GPa [Threads] mN/tex, cN/tex, N/tex, kN/tex, mN/dtex, cN/dtex, N/dtex, kN/dtex, gf/d, kgf/d, tf/d
Position	mm, cm
Position (strain)	%, µst
Displacement transducer	mm, cm
Displacement transducer (strain)	%, µst
Displacement	mm, cm
Displacement (strain)	%, µst
Height	mm, cm
Time	ms, sec, min
Ratio	[Other than threads] Unit of testing force/mm^2, unit of testing force/cm^2, unit of testing force/m^2, and Pa, kPa, MPa, GPa [Threads] mN/tex, cN/tex , N/tex, kN/tex, mN/dtex, cN/dtex, N/dtex, kN/dtex , gf/d, kgf/d, tf/d
Slope	Unit of testing force/mm, unit of testing force/cm
Energy	mN-mm, cN-mm , N-mm, kN-mm, gf-mm, kgf-mm, tf-mm, J

Data processing software for TGI/TGE/TG/TGJ series

(1) Displacement origin

Calculates a value based on the selection of [Initial test force point], [Regress point], or [Test start point].

Type

Testing force	Stress	Position
Position (strain)	Displacement transducer	Displacement transducer (strain)
Displacement	Displacement (strain)	Height
Time		

(2) Elastic modulus 1 to 3 (standard)

Type

Ratio	Slope	

(3) Elastic modulus 1 to 3 (chord)

Type

Ratio	Slope	

(4) Elastic modulus 1 to 3 (max. slope)

Type

Ratio	Slope	

(5) Elastic modulus 1 to 3 (target)

Type

Ratio	Slope	

(6) Maximum point

Type

Testing force	Stress	Position
Position (strain)	Displacement transducer	Displacement transducer (strain)
Displacement	Displacement (strain)	Height
Time		

(7) Minimum point

Type

Testing force	Stress	Position
Position (strain)	Displacement transducer	Displacement transducer (strain)
Displacement	Displacement (strain)	Height
Time		

Data processing software for TGI/TGE/TG/TGJ series

(8) Break point

Type

Testing force	Stress	Position
Position (strain)	Displacement transducer	Displacement transducer (strain)
Displacement	Displacement (strain)	Height
Time		

(9) Upper yield point (%F.S.)

Type

Testing force	Stress	Position
Position (strain)	Displacement transducer	Displacement transducer (strain)
Displacement	Displacement (strain)	Height
Time		

(10) Upper yield point (displacement)

Type

Testing force	Stress	Position
Position (strain)	Displacement transducer	Displacement transducer (strain)
Displacement	Displacement (strain)	Height
Time		

(11) Lower yield point

Type

Testing force	Stress	Position
Position (strain)	Displacement transducer	Displacement transducer (strain)
Displacement	Displacement (strain)	Height
Time		

(12) Yield strength point 1 to 3

Type

Testing force	Stress	Position
Position (strain)	Displacement transducer	Displacement transducer (strain)
Displacement	Displacement (strain)	Height
Time		

(13) Intermediate testing force 1 to 10

Type

Testing force	Stress	

Data processing software for TGI/TGE/TG/TGJ series

(14) Intermediate displacement 1 to 10

Type

Position	Position (strain)	Displacement transducer
Displacement transducer (strain)	Displacement	Displacement (strain)
Height		

(15) Energy

Type

Energy		

(16) Initial tension resistance

Type

Ratio		

(17) n value

No specific types available

(18) Break elongation

%, mm, cm

(19) Eutt elongation

%, mm, cm

(20) Reduction of area

%

(21) Poisson's Ratio

No specific types available

* Not available for control mode.

(22) Marker 1 to 10

Calculates values of points marked using an optional marker controller.

Type

Testing force	Stress	Position
Position (strain)	Displacement transducer	Displacement transducer (strain)
Displacement	Displacement (strain)	Height
Time		

Data processing software for TGI/TGE/TG/TGJ series

4-9-2. Peel

Peel analysis can be conducted either without dividing the analysis area or by dividing the area into two or more (up to 10) divisions. Below, analysis items that can be calculated per division are identified with "(division)" after the item name.

The following analysis item units can be calculated.

[Displacement transducer] and [Displacement transducer (strain)] are only available when using a displacement transducer.

Type	Units
Testing force	mN, N, kN, gf, kgf, tf
Unit of testing force	Unit of testing force/mm, unit of testing force/cm
Conversion of testing force	mN・w, cN・w , N・w, kN・w, gf・w, kgf・w, tf・w
Coefficient of friction	None

(1) Displacement origin

Calculates a value based on the selection of [Initial test force point], [Regress point], or [Test start point].

Type

Testing force	Unit of testing force	Conversion of testing force
Coefficient of friction		

(2) 1st peak point

Type

Testing force	Unit of testing force	Conversion of testing force
Coefficient of friction		

(3) 1st bottom point

Type

Testing force	Unit of testing force	Conversion of testing force
Coefficient of friction		

(4) Maximum peak point 1 to 2

Type

Testing force	Unit of testing force	Conversion of testing force
Coefficient of friction		

(5) Minimum valley point 1 to 2

Type

Testing force	Unit of testing force	Conversion of testing force
Coefficient of friction		

Data processing software for TGI/TGE/TG/TGJ series

(6) Intermediate testing force 1 to 10

Type

Testing force	Unit of testing force	Conversion of testing force
Coefficient of friction		

(7) Mean of intermediate testing force points 2 to 10

Type

Testing force	Unit of testing force	Conversion of testing force
Coefficient of friction		

(8) Tearing strength

Type

Unit of testing force		

(9) Peel force

Type

Testing force	Unit of testing force	Conversion of testing force
Coefficient of friction		

(10) Integral mean (division)

Type

Testing force	Unit of testing force	Coefficient of friction

(11) Simple mean (division)

Type

Testing force	Unit of testing force	Coefficient of friction

(12) Peak point mean (division)

Type

Testing force	Unit of testing force	Coefficient of friction

(13) Bottom point mean (division)

Type

Testing force	Unit of testing force	Coefficient of friction

(14) Peak and bottom point mean (division)

Type

Testing force	Unit of testing force	Coefficient of friction

Data processing software for TGI/TGE/TG/TGJ series

(15) Large/small peak 6-point mean (division)

Type

Testing force	Unit of testing force	Coefficient of friction

(16) Coefficient of static friction

1st peak point (gf)/coefficient of friction weight

(17) Coefficient of dynamic friction

Simple mean of testing force (gf)/coefficient of friction weight

(18) Collection mean

Adds the results of above analysis items, as specified, and calculates the mean.

* Some analysis items cannot be added.

Type

Testing force	Unit of testing force	Coefficient of friction

Data processing software for TGI/TGE/TG/TGJ series

4-9-3. Cycle, Control

The following analysis item units can be calculated.

Type	Units
Testing force	mN, cN, N, kN, gf, kgf, tf
Stress	[Other than threads] Unit of testing force/mm^2, unit of testing force/cm^2, unit of testing force/m^2 and Pa, kPa, MPa, GPa [Threads] mN/tex, cN/tex, N/tex, kN/tex, mN/dtex, cN/dtex, N/dtex, kN/dtex , gf/d, kgf/d, tf/d
Position	mm, cm
Position (strain)	%, μst
Displacement	mm, cm
Displacement (strain)	%, μst
Height	mm, cm
Time	ms, sec., min
Energy	mN-mm, cN-mm, N-mm, kN-mm, gf-mm, kgf-mm, tf-mm, J

(1) Displacement origin

Calculates a value based on the selection of [Initial test force point], [Regress point], or [Test start point].

Type

Testing force	Stress	Position
Position (strain)	Displacement	Displacement (strain)
Height	Time	

(2) Maximum point

Type

Testing force	Stress	Position
Position (strain)	Displacement	Displacement (strain)
Height	Time	

(3) Minimum point

Type

Testing force	Stress	Position
Position (strain)	Displacement	Displacement (strain)
Height	Time	

Data processing software for TGI/TGE/TG/TGJ series

(4) Maximum return point

Type

Testing force	Stress	Position
Position (strain)	Displacement	Displacement (strain)
Height	Time	

(5) Minimum return point

Type

Testing force	Stress	Position
Position (strain)	Displacement	Displacement (strain)
Height	Time	

(6) Intermediate testing force 1 to 10 (increase)

Type

Testing force	Stress	

(7) Intermediate testing force 1 to 10 (decrease)

Type

Testing force	Stress	

(8) Intermediate displacement 1 to 10 (increase)

Type

Position	Position (strain)	Displacement
Displacement (strain)	Height	

(9) Intermediate displacement 1 to 10 (decrease)

Type

Position	Position (strain)	Displacement
Displacement (strain)	Height	

(10) Elastic modulus 1 to 3 (standard) (increase)

Type

Ratio	Slope	

(11) Elastic modulus 1 to 3 (standard) (decrease)

Type

Ratio	Slope	

(12) Elastic modulus 1 to 3 (chord) (increase)

Type

Ratio	Slope	

Data processing software for TGI/TGE/TG/TGJ series

(13) Elastic modulus 1 to 3 (chord) (decrease)
Type

Ratio	Slope	

(14) Elastic modulus 1 to 3 (target) (increase)
Type

Ratio	Slope	

(15) Elastic modulus 1 to 3 (target) (decrease)
Type

Ratio	Slope	

(16) Elastic modulus (average) 1 to 3 (chord)
Type

Ratio	Slope	

(17) Elastic modulus (average) 1 to 3 (target)
Type

Ratio	Slope	

(18) Midpoint average 1 to 10
Type

Testing force	Stress	Position
Position (strain)	Displacement	Displacement(strain)

(19) Energy (increase)
Type

Energy		

(20) Negative energy (increase)
Type

Energy		

(21) Energy (decrease)
Type

Energy		

Data processing software for TGI/TGE/TG/TGJ series

(22) Negative energy (decrease)

Type

Energy		

(23) Cycle energy

Type

Energy		

(24) Negative cycle energy

Type

Energy		

(25) Positive/negative cycle energy

Type

Energy		

(26) Hysteresis

Type

Energy		

(27) Hysteresis loss

Type

Energy		

(28) Residual elongation

Type

Testing force	Stress	Position
Position (strain)	Displacement	Displacement (strain)
Height	Time	

4-10. Formula

Using the custom formula function enables output according to calculations of your choice, which can include the specified analysis items.

4-11. Statistics Items

The following can be calculated from results of each analysis item:

Mean, standard deviation (σn-1), maximum value, minimum value, 3σ, maximum - minimum values, median value, JIS K6301 mean, coefficient of variation, Σxi, and Σxi2.

Statistics results can also be calculated for sub-batches.

Data processing software for TGI/TGE/TG/TGJ series

4-12. Repeating Analysis

Using data from testing, analysis results for a sample can be changed without changing conditions. Analysis points and other data can be moved easily with mouse operations as you watch the graph.

[Analysis point available for reanalysis]

Type of Test	Type of Test		
Single Control	Maximum point	Minimum point	Break point
	Upper yield point (%F.S.)	Upper yield point (displacement)	Lower yield point
	Elastic modulus 1 to 3 (standard)	Elastic modulus 1 to 3 (chord)	Elastic modulus 1 to 3 (max. slope)
	Elastic modulus (target) 1 to 3	Initial tension resistance	Yield strength point 1 to 3
	Intermediate displacement 1 to 10	Intermediate testing force 1 to 10	Displacement origin
	Poisson's Ratio	Control point 1 to 20	
Peel	Maximum peak point 1 to 2	Minimum valley point 1 to 2	1st peak point
	1st bottom point	Intermediate testing force 1 to 10	Displacement origin
	Number of peak points	Number of bottom points	
Cycle	Maximum point	Minimum point	Intermediate displacement (increase) 1 to 10
	Intermediate displacement (decrease) 1 to 10	Intermediate testing force (increase) 1 to 10	Intermediate testing force (decrease) 1 to 10
	Elastic modulus 1 to 3 (standard) (increase)	Elastic modulus 1 to 3 (standard) (decrease)	Elastic modulus 1 to 3 (chord) (increase)
	Elastic modulus 1 to 3 (chord) (decrease)	Elastic modulus 1 to 3 (target) (increase)	Elastic modulus 1 to 3 (target) (decrease)
	Elastic modulus (average) 1 to 3 (chord)	Elastic modulus (average) 1 to 3 (target)	Midpoint average 1 to 10
	Displacement origin	Residual elongation	Control point 1 to 20

Data processing software for TGI/TGE/TG/TGJ series

4-13. Graphs

[Graph Specifications]

No. displayed	Up to two graphs can be displayed simultaneously.		
Show/hide	Can be specified for each graph.		
Displayable graph types	Individual graph, overlay graph, trend graph * Trend graphs are only available during cyclical testing.		
Y axis	Title	Customizable	
	Applies to	Testing force, stress, position (with or without strain), displacement transducer (with or without strain), displacement (with or without strain), time * Displacement transducer (with or without strain) is only available when using a displacement transducer.	
	Units	Testing force	mN, cN, N, kN, gf, kgf, tf
		Stress	[Other than threads] Unit of testing force/mm^2, unit of testing force/cm^2, unit of testing force/m^2 and Pa, kPa, MPa, GPa [Threads] mN/tex, cN/tex , N/tex, kN/tex, mN/dtex , cN/dtex、N/dtex、kN/dtex , gf/d, kgf/d, tf/d
		Position	mm, cm
		Position (strain)	%, µst
		Displacement transducer	mm, cm
		Displacement transducer (strain)	%, µst
		Displacement	mm, cm
		Displacement (strain)	%, µst
		Time	ms, s, min
	Scale setting	Maximum and minimum values are customizable. * The scale can also be determined automatically.	

Specifications

TgAnest

Data processing software for TGI/TGE/TG/TGJ series

X axis	Title	Customizable	
	Applies to	Testing force, stress, position (with or without strain), displacement transducer (with or without strain), displacement (with or without strain), time * Displacement transducer (with or without strain) is only available when using a displacement transducer.	
	Units	Testing force	mN, cN, N, kN, gf, kgf, tf
		Stress	[Other than threads] Unit of testing force/mm^2, unit of testing force/cm^2, unit of testing force/m^2 and Pa, kPa, MPa, GPa [Threads] mN/tex, cN/tex , N/tex, kN/tex, mN/dtex, cN/dtex, N/dtex, kN/dtex, gf/d, kgf/d, tf/d
		Position	mm, cm
		Position (strain)	%, µst
		Displacement transducer	mm, cm
		Displacement transducer (strain)	%, µst
		Displacement	mm, cm
		Displacement (strain)	%, µst
		Time	ms, s, min
		External input	*Display units of your choice can be entered
		External input(strain)	%, µst
	Scale setting	Maximum and minimum values are customizable. * The scale can also be determined automatically.	
	* Only [No. of times] is available for the X axis of trend graphs.		
Graph line color	Customizable. * The same color is used for all lines of each individual graph. Specify the color to use. * Line colors on overlay graphs can be set individually for up to 10 lines. For the 11th line, the 1st line color is used again.		
Optional functions	Graphing mean curves, enlarging graphs, customizing analysis point style and color * Mean curves are only available with overlay graphs.		

Data processing software for TGI/TGE/TG/TGJ series

4-14. File Output

File Output Specifications

Type	Output Information		Description	Output Format
Data	Raw data output		Outputs sampled data. * Files can be output automatically.	CSV
	Analysis results		Outputs analysis results from testing.	CSV
	Peak and bottom points		The peak/bottom point with the larger testing force is output first.	CSV
Graph	Graph 1/ Graph 2 images	No analysis results	Outputs the selected graph as an image.	WMF
		With analysis results	Outputs the graph and analysis results as an image.	WMF
	* The option to output with analysis results is not available for overlay graphs.			
Report	Output report as PDF		Outputs the report as a PDF file instead of printing it.	PDF

4-15. Printing

Test results can be printed as a report in the specified design.

Printing options include printing only graphs and printing graphs with analysis results.

Type of Printing	Information Printed		Description
Graph	Graph 1/ Graph 2 printing	No analysis results	Prints the selected single graph.
		With analysis results	Prints the single graph and analysis results.
	* The option to print with analysis results is not available for overlay graphs.		
Report	Print test results		Prints test results in the layout specified using the report designer function.

* Report design function

The following items can be added in your preferred position, and the layout you create can be saved. You can also load saved layouts to use them later.

Data processing software for TGI/TGE/TG/TGJ series

Item	Description
Title	Adds a report title to the report. Enter a title of your choice, and specify your preferred font.
Test piece	Adds information about the test piece specified in the test conditions to the report.
Analysis results	Adds the analysis results from testing to the report.
Test condition	Choose your preferred test condition parameters to add to the report.
Picture	Load a picture file and add it to the report.
Graph	Adds the selected graph to the report.
Comments	Adds comments to the report. Enter comments of your choice, and specify your preferred font.
Diagram	Adds a diagram to the report. The length and the direction of line can be changed as you like.

4-16. Quick Start

Registering frequently used test conditions in Quick Start enables you to start tests in a single step.

Max. no. registered	30
Test condition name	Registered test condition names are listed automatically.
Keyword	Keywords can be added to registered conditions. Use keywords as a supplemental description of registered conditions.
User name	User names can be added to registered conditions. This information is convenient in identifying who uses the conditions.
Folder name	File paths of registered conditions are displayed automatically.

* Input of keywords and user names is optional.
* Information entered can easily be deleted. (However, to reduce the possibility of accidental deletion, security features can be used to require password input before deletion.)
* Test conditions and folders cannot be renamed.

Data processing software for TGI/TGE/TG/TGJ series

5. Order Details

Indicate the required test modes.

Fill in the items as needed.

☐ Single
Single test mode includes tension, compression, 3-/4-point bending, peel, creep, auto load, and Flexible Correction.

☐ Cycle
Cycle test mode includes tension, compression, and 3-/4-point bending.

☐ Control
Control test mode includes tension, compression, 3-/4-point bending, creep, relaxation, auto load, and Flexible Correction.

* Control enables creation of up to 20 control parameters for the testing machine to follow.

6. Warranty

The warranty for this software is valid for a period of one year from the date of delivery.

When the trouble by originating of our software occurs in the guaranteed term, we would upgrade the software in free of charge after correcting trouble.

When the guaranteed term ends, the software upgrade becomes for a fee or the trouble might not be able to be supported.

The guaranteed term of one year from the day delivered in the beginning is not changed.

* Specifications are subject to change without notice.