

SPECIFICATIONS

Universal Testing Machine

TGI-250kN

SPEC.No. ENTGI4113E 1/10

1. General

TGI type universal testing machine has developed with the concept of achieving “Fulfillment of functions and simple operations”. Equipped with AC servo motor, high accurate measurement can be provided, that is, featuring high excellent accuracy in test speed and also realizing stable high speed data sampling. Moreover, due to the Menu mode that divided in each application, its design is fully considered in making easy operation. You can make use of this testing machine for the strength test for various kinds of materials and check on products and so on, that is, in wide range of fields.

2. Specifications

2-1	Maximum test force	250 kN {25.49 tf}
2-2	Testing space	Tension and Compression test can be available at the lower section of movable crosshead. Upper tension type : Optional model
2-3	Permissible testing force and test speed	250 kN {25.49 tf} over entire speed range
2-4	Effective test width	600 mm(Attached with protection cover for ball screws.)
2-5	Movable crosshead stroke	Without installing the test jig and load cell: 1 550 mm Extension of stroke : Optional model
2-6	Movable crosshead speed range	0.0005 mm/min ~ 500 mm/min 0.1 mm/min ~ 500 mm/min →Setting can be made by the pitch of 0.1 mm/min among them. Less than 0.05mm/min will be 0.05, 0.03, 0.02, 0.01, 0.005, 0.003, 0.002, 0.001 and 0.0005. (9 steps)
2-7	Return speed	0.1 mm/min ~ 750 mm/min Optional setting can be made.
2-8	Manual speed	3 speeds of changeover method of HIGH,MIDDLE and LOW.
2-9	Setting method of speed	Input values with the operation panel.
2-10	Accuracy on speed	±0.1 % of setting speed
2-11	Measurement of test force Range of test force	2 kinds of selection method: AUTO : (1/1 ~ 1/250 of accuracy guaranteed range of Load cell) 100 : (1/100 ~ 1/1 000 of accuracy guaranteed range of Load cell)

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Test force display	5-digits digital display (with negative sign) Range AUTO : 0.001 kN ~ 250.00 kN Resolution 1/5 000 With increase/decrease of test force, full scale of display, decimal position and display unit will change automatically. Range 100 : 0.003 kN ~ 2.5000 kN Resolution 3/25 000 *Display of test force shall be changed depending to the load cell attached.
Measurement accuracy	Standard accuracy : ± 1 % of indicated value (Range of 1/1 ~ 1/1 000 of rated capacity of Load cell : 0.25 kN ~ 250 kN) High accuracy : ± 0.5 % of indicated value (Optional item) (Range of 1/1 ~ 1/1 000 of rated capacity of Load cell : 0.25 kN ~ 250 kN) * No vibration where the testing machine is installed.
AD sampling	1 000 times/s
Display times	4 times/s
Peak/Break detection function	After test is made, test force value of peak and the position value or test force value of break point and the position value are displayed with the [PEAK/BREAK] key.
Auto zero function	Automatic zero point adjustment with the [ZERO] key.
Measurement unit	SI unit : mN, N, kN
Load cell capacity evaluation function	Automatic judgment function applied
Analog output	DC ± 5 V (Output connector : BNC female) Load resistance 5 k Ω or more, scaling function applied. Accuracy : ± 0.5 %F.S. Resolution : Approx. 1/4 000 Output cable : Optional item
2 - 12 Movable crosshead position display	
Position display	6 1/2 digits digital display (with negative sign)
Display range	The minimum unit : 0.001 mm, The maximum display : ± 1 999.999 mm
Display resolution	0.001
Display unit	mm
Zero reset	Zero reset can be made at the optional position with the [RESET] key.
Analog output	DC ± 5 V (output connector : BNC female) Load resistance 5 k Ω or more with scaling function attached. Accuracy : ± 0.5 %F.S. Resolution : Approx 1/4 000 Output cable : Optional item

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2 – 13	Cycle testing function	
	Setting method	Cycle test with the position value, cycle test with the test force value and also the cycle test can be available by the combination of the two.
	The maximum repeatability times	10 000 times
	The maximum repeatability speed	5 times /min
2 – 14	Sample break detection function	<p>Detects the sample detection and stops the operation of movable crosshead or makes it reversed to the 0 mm position automatically.</p> <ul style="list-style-type: none"> • Detects when the test force decreases suddenly more than ** % (0.04 % ~ 99.00 %) of the max. value in display range at present after exceeding 7 % of the max. value in display range at present, or also detects when the test force decreased less than 5 % of the max. value in display range at present. • Setting the movement of movable crosshead (stop, reverse and ignorance of detection) can be made at the time of break detection from Menu mode. • ** % (Break sensitivity) can be set in the Menu mode optionally.
2 – 15	Safety device	
	EMERGENCY SW	Cuts off power to the servo motors when activated. (Locking switch)
	Overload limit	When the test force value reaches ± 102 % of rated capacity of load cell, this Overload limit outputs the signal of operation stop and makes the movable crosshead stopped. However, at the time of setting 100 times of range, it stops at ± 102 % of 100 times of full scale.
	Function of preparation for operation	Makes the servo OFF during the EMERGENCY SW and the Stroke limit operation are made, the power to the servo motor is cut. By inputting the SET SW attached to the main body of testing machine, you can feed power to the servo motor.
	Stroke limit	The movable crosshead movement upper and lower limit positions can be set by the user.
	Servo amplifier emergency stop function	Power to the servo motors is cut off when activated. Cuts off power to the servo motors when activated.

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<p>Load cell protection function</p>	<p>During the manual operation or return operation, this is the function to stop the operation of movable crosshead automatically when more than $\pm 102\%$ of 1/50 test force is applied. (Effective/Ineffective setting can be made with the Function F-008.)</p> <p>*As for the above safety device, Alarm display will be shown during operation. (Except for load cell protection function.)</p>
<p>2-16 Test condition registration function</p>	<p>Test conditions can be registered in the file up to 10 pcs at max. By reading the registered files, the test condition in the testing machine can be set automatically.</p>
<p>2-17 Communication function</p> <p style="padding-left: 20px;">Standard</p> <p style="padding-left: 20px;">Connection</p> <p style="padding-left: 20px;">Communication times</p>	<p>Used in the communication with external devices such as personal computer and so on.</p> <p>Confirms to USB2.0.</p> <p>You can also use with the standard of USB1.1. (connector : B type female)</p> <p>USB connection port</p> <p>Transfer of test force and position value can be available in 100 times/s.</p>
<p>2-18 Keeping test condition</p>	<p>Setting contents at the time of cutting off the power supply can be kept. However, operation condition will not be kept. (The moving crosshead remains stopped.)</p>
<p>2-19 Horizontal adjustment</p>	<p>Level adjusters that can be adjusted horizontally are attached at the bottom section of the testing machine.</p>
<p>2-20 Outline dimensions</p>	<p>Width 1 420 mm × Height 2 406 mm (*) × Depth 894 mm</p> <p>* Excludes level adjuster.</p> <p>Wiring space for the connection of connector at the rear side of testing machine : 150 mm</p>
<p>2-21 Weight</p>	<p>Approx. 1 200 kg</p>
<p>2-22 Power supply</p> <p style="padding-left: 20px;">Power supply voltage</p> <p style="padding-left: 20px;">Power consumption</p> <p style="padding-left: 20px;">Frequency</p>	<p>Three-phase 200 ~ 230V +10 % ~ -15 % AC</p> <p>7.5 kW</p> <p>50/60 Hz</p>
<p>2-23 Operating conditions</p>	<p>Temperature : 5 °C ~ 40 °C</p> <p>Humidity : 20 %RH ~ 80 %RH (no condensation)</p>

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2-24 Standard accessories

Tools	1 set (Tool box, hexagon wrench set, Phillips screwdriver)
Earth wire	5 m ×1
Power supply cable	5 m ×1 200 V AC, Round type crimp terminal lugs are attached at cable end
Instruction manual	1 copy each

3. Optional Functions (■ indicates included function, □ indicates function not included.)

- High accuracy test force (TGI-LHP)
±0.5 % of indicated value
- USB communication cable (TGI-USB)
A connector male ~ B connector male
Length: 2 m
- Upper section tension type (TGI250-UT)
Make the test space of tension test to the upper section of movable crosshead.
- Stroke extension type (TGI250-L**0)
Extends total testing machine length to **0 mm.
- Extensive width type (TGI250-W**0)
Set effective width of test to **0 mm.
- Chuck adapter (TGE10-CHB)
Installation adapter for lower chuck for tension test.
Used when less the 10kN of chuck is applied.
Accessories tools Chuck tightening hook ×1
- Chuck adapter (TGE50-CHB)
Installation adapter for lower chuck for tension test.
Used when 20/50kN of chuck is applied.
Accessories tools Chuck tightening hook ×1
- RS-232C communication function (TGI-232C)
Connects to PC or other external device.
(When the RS-232C communication function is installed, the USB interface can't be used.)
Standard RS-232C
Communication times Test force, position value can be transferred at 1 000 times/s.
Cable RS-232C straight cable attached.
(D-sub 9 pin female ~ D-sub 9 pin male, length: 2 m)

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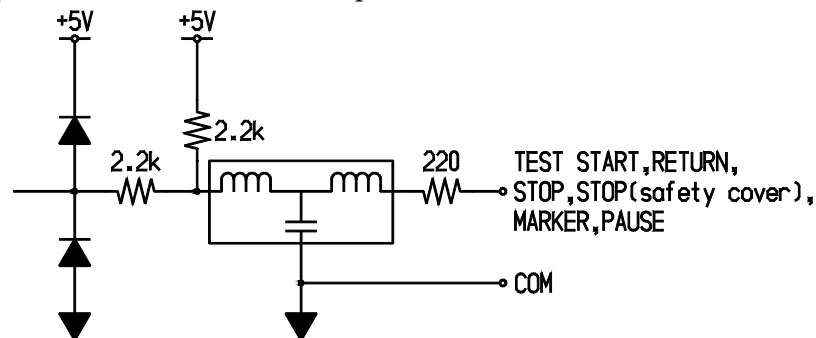
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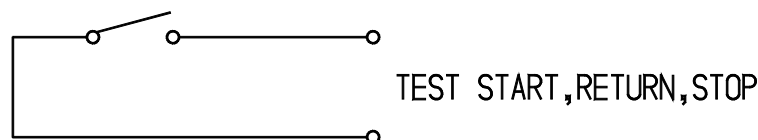
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- Analog output cable (CAC-124S-2M)
 BNC cable (One side is Y terminal, 2 m)
- Remote controller (TGI-RMT)
 Handy controller for external control. Cable length: 2 m
 External control "TEST START" · "RETURN" · "STOP" ·
 "MANUAL UP" · "MANUAL DOWN" ·
 "MANUAL SPEED SELECT"
 Outline dimensions (W × H × D) 80 mm×125 mm×30 mm
- Remote controller (TGI-RMT-J)
 Handy controller for external control. Cable length: 2 m
 External control "TEST START" · "RETURN" · "STOP" ·
 "MANUAL UP" · "MANUAL DOWN" ·
 "MANUAL SPEED SELECT" and "JOG DIAL"
 Outline dimensions (W×H×D) 80 mm×180 mm×37 mm
- External control Input / Output (TGI-I/O)
 Contact input 6 points
 Input signal Input "TEST START" · "RETURN" · "STOP" ·
 "STOP (safety cover)" · "MARKER" and "PAUSE".

Equivalent circuit for contact input section



Contact output 3 points
 Output signal Outputs "TEST START" · "RETURN" and "STOP".
 Equivalent circuit for contact output section



Specifications for contact input/output

- 1a contact
- AC125 V, 0.4 A (resistance load)
- DC30 V, 2 A (resistance load)

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Connector pin layout Suitable plug : MR-16M

Pin No.	Signal name	Pin No.	Signal name
1	PAUSE (Input)	9	N.C.
2	MARKER (Input)	10	COM (Input)
3	RETURN (Input)	11	RETURN (Output)
4	TEST START (Input)	12	RETURN (Output)
5	STOP (Input)	13	TEST START (Output)
6	COM (Input)	14	TEST START (Output)
7	N.C.	15	STOP (Output)
8	N.C.	16	STOP (Output)

* Never connect with the N.C. pins.

Connector pin layout Suitable plug : R05-PB2M

Pin No.	Signal name
1	STOP (safety cover)
2	COM

Displacement measurement function (TGI-AMP)

For the display and each setting, the data processing software is required.

Line up

Make selection from below: (Plural number can be selectable.)

- TGI-AMP-01 strain : 1 mV/V, excitation voltage: DC12 V
- TGI-AMP-02 strain : 1.5 mV/V, excitation voltage: DC3 V
- TGI-AMP-04 voltage : DC0 V ~ DC5 V

Display section

5-digits display (with negative sign)

Display range

-99 999 ~ 99 999

Measurement range

Once

Measurement accuracy

Standard accuracy: ± 1 % of indicated value

High accuracy: ± 0.5 % of indicated value (Optional item)

There may have the cases of changes of accuracy depending on the sensors used.

Measurement unit

mm

Automatic zero function

Attached as a standard.

Capacity judgment function

Attached as a standard.

Calibration function

Attached as a standard.

Analog output

DC ± 5 V (Output connector : BNC female)

Load resistance 5 k Ω or more, scaling function applied.

Accuracy : ± 0.5 %F.S.

Resolution : Approx. 1/4 000

Cable : Optional item

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Simple creep testing function (TGI-CRP)

Makes test that keeps on loading the set test force to the sample.

Continues test until the “STOP” key is pressed.

Setting method

Set from the Menu mode.

Setting contents

Set sets force value : Test force value applied to the sample.
Creep control width : Setting PI control starting position (test force)

Automatic load function (TGI-ALC)

Function that keeps increase of test force to be the constant one.

Setting method

Set from the Menu mode.

Setting contents

Arrival time: Time to arrive to the set test force. *** sec.
The Max. speed: The max speed during control *** mm/min

Automatic cancel (TGI-LOAD)

Adjust the load to zero that occurred when the sample is chucked with the automatic control.

When the function is used, special data processor software is required.

Start of control

Control with the data processor software.

During Control, other than the “STOP” signal will not be accepted.

End of control

End of Control can be made when the test force is zero or with the “STOP” signal.

Specifications and visual appearance are subject to change without notice to allow product improvements.

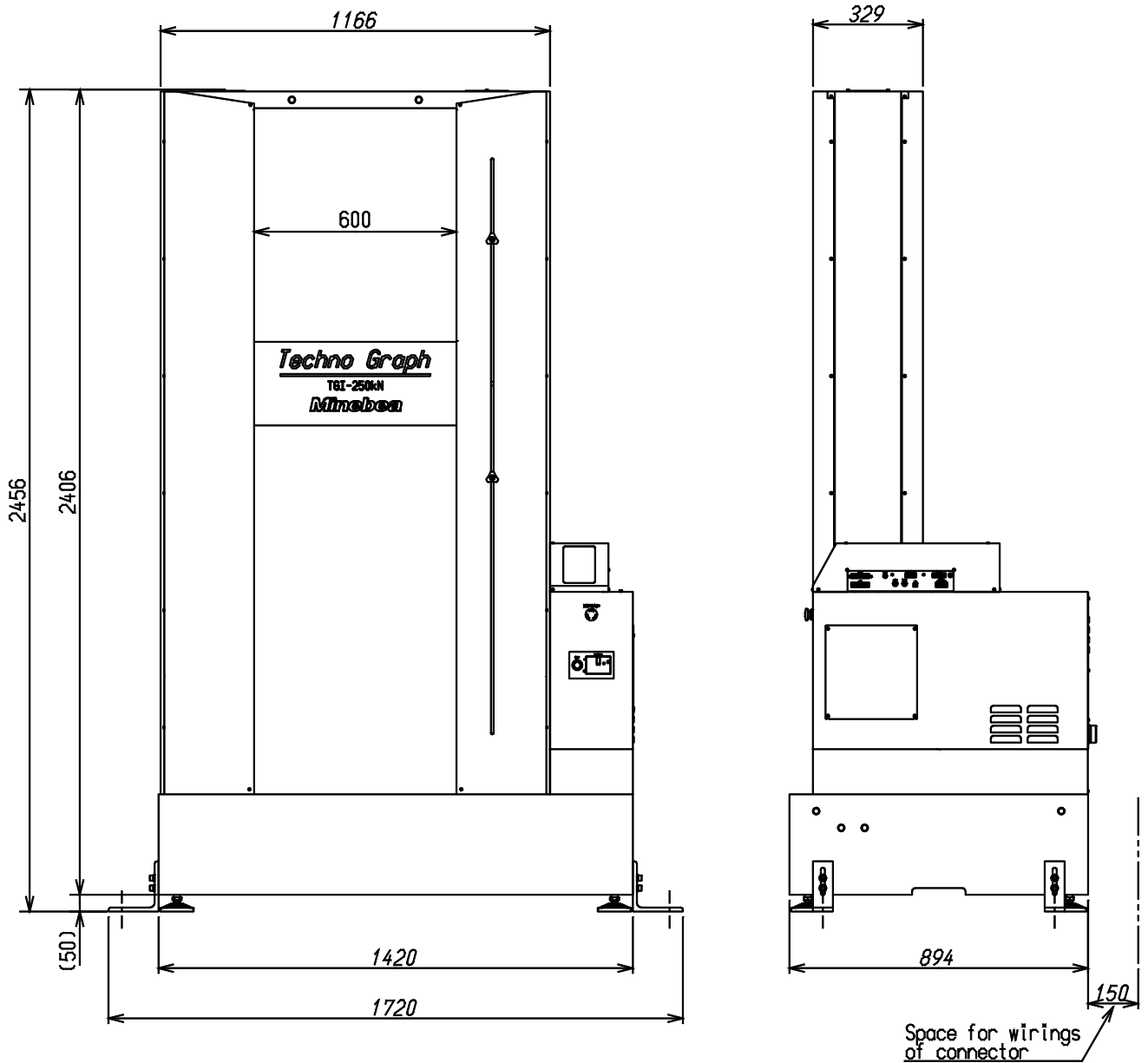
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Testing machine external appearance

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Unit : mm

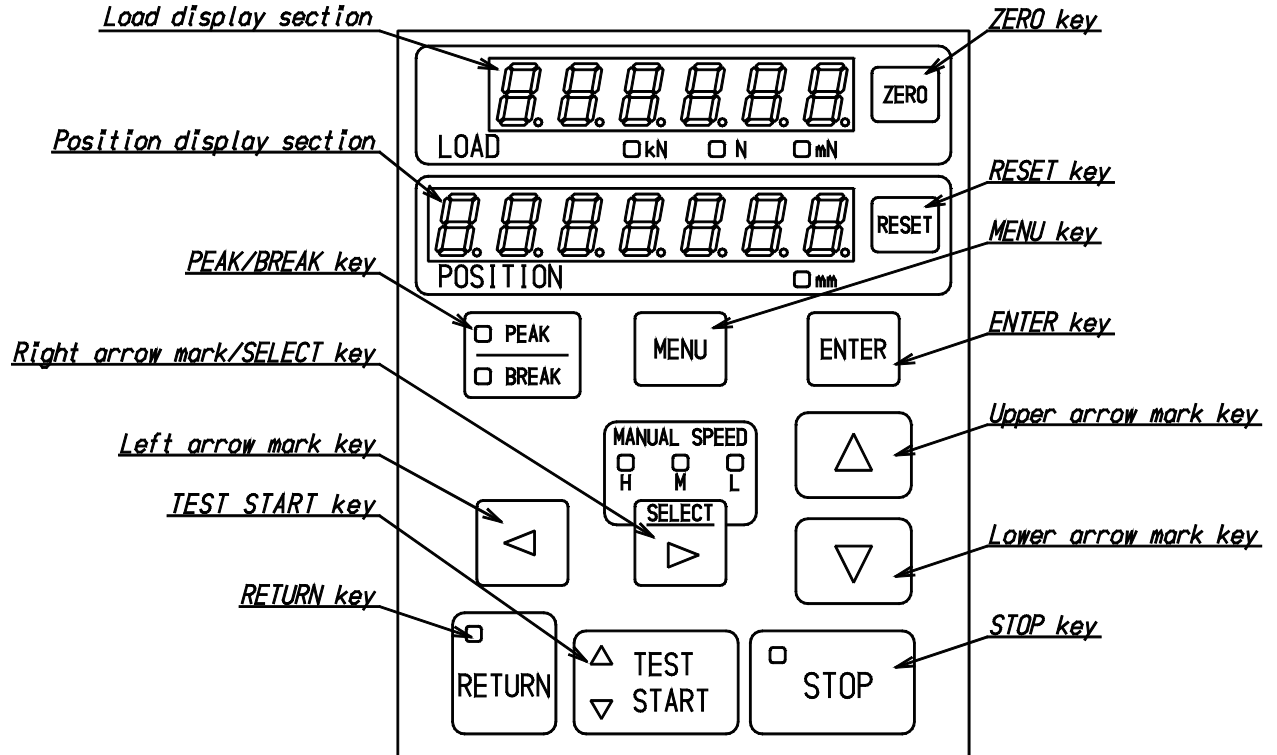
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Operation panel external appearance



Test force	Displays test force value, menu and alarm display.
Position display section	Displays position value, set value and alarm display.
ZERO key	Makes reset the test force to zero.
RESET key	Resets the position value to zero.
PEAK/BREAK key	On the test force display/Position display section each displays test force value of peak and position value each, and test force value and position value of break point can be shown.
MENU key	Changeover key to the Menu mode. Cancel key during the Menu is set.
ENTER key	Fixed key during the Menu is set.
Left arrow make key	Shifts the digit to the left during the Menu is set.
Right arrow mark/SELECT key	Shifts the digit to the right during the Menu is set. Changes the speed (HIGH, MIDDLE, LOW) during the manual operation.
Upper arrow mark key	During manual operation, makes the movable crosshead risen. During setting Menu, makes the value increased.
Lower arrow mark key	During setting Menu, makes the Menu changed. During manual operation, makes the movable crosshead decreased. During setting Menu, makes the menu changed.
RETURN key	Makes the movable crosshead reversed to the position 0 mm.
TEST START key	Test shall be started by pressing the key.
STOP key	Test shall be started by pressing the key.