

## SPECIFICATIONS

Universal Testing Machine

TGJ-1kN

SPEC.No.ENTGJ4123 1/10

### 1. General

The TGJ series of Universal testing machines is designed to offer extensive functionality, a broad range of applications, and ease of use.

### 2. Specifications

|     |  |   |
|-----|--|---|
| 2-1 | Maximum test force                       | 1 kN (102.0 kgf)  |
| 2-2 | Test space                               | Tensile/compression testing is possible beneath the movable crosshead.<br>Optional model: Allows tensile testing above the movable crosshead and compression testing beneath the movable crosshead. |
| 2-3 | Permissible testing force and test speed | 1 kN (102.0 kgf) over entire speed range  |
| 2-4 | Effective test width                     | 300 mm  |
| 2-5 | Movable crosshead stroke                 | 770 mm without test jig and load cell   |
| 2-6 | Movable crosshead speed range            |   |
|     | Test speed                               | 22 steps: 0.005, 0.01, 0.02, 0.03, 0.05, 0.1, 0.2, 0.3, 0.5, 1, 2, 3, 5, 10, 20, 30, 50, 100, 200, 300, 500, 1 000 mm/min   |
|     | Custom test speed                        | 0.1 mm/min ~ 999.9 mm/min<br>in 0.1 mm/min increments   |
|     | Return speed                             | Single preset speed or test speed setting<br>With zero-overshoot function   |
| 2-7 | Speed setting method                     |   |
|     | Test speed                               | Digital display setting using cursor keys   |
|     | Custom test speed                        | Digital display setting using function keys and cursor keys   |
|     | Return speed                             | Digital display setting using function keys and cursor keys   |
| 2-8 | Speed accuracy                           |   |
|     | Test speed                               | Speed setting $\pm 0.1$ %   |
|     | Custom test speed                        | Speed setting $\pm 2$ %   |
|     | Return speed                             | Speed setting $\pm 2$ %   |
| 2-9 | Test force measurement                   |   |
|     | Test force display                       | 5-digit digital display (with negative sign)  |
|     | Measurement range                        | 7 steps: x1, x2, x5, x10, x20, x50, x100<br>(for 3 mV/V load cell)  |
|     | Measurement accuracy                     | Between 20 and 100 % for each range<br><input type="checkbox"/> Indicated value $\pm 1$ % <input type="checkbox"/> Indicated value $\pm 0.5$ %  |
|     | Peak hold function                       | Standard function: Auto peak reset at start of testing  |

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|   |  |
|---|--|
| Auto zero function                          | Standard function<br>Long press: Hold down the [AUTO ZERO] key for at least 2 seconds to adjust the zero point for all ranges.<br>Short press: Press the [AUTO ZERO] key to adjust the zero point.   |
| Auto calibration function                   | Standard function:<br>Auto span adjustment with load cell connected up to 10 load cells can be registered.(A single tensile and compressive load cell is registered as two load cells.)  |
| Measurement units                           | Choice of SI units and gravitational units (kgf system)<br>Automatic switching between mN, N, and kN or gf, kgf, and tf. Also allows user selection. (Normal/special display)  |
| Load cell capacity evaluation function      | Standard function  |
| Maximum/minimum settings                    | Digital display setting using function keys and cursor keys  |
| Analog output                               | $\pm 5$ V DC (output connector: BNC female)<br>Load resistance 5 k $\Omega$ or more, with scaling function<br>Accuracy: $\pm 0.5$ %F.S.<br>Resolution: Approx. 1/4 000<br>Output cable: Optional item  |
| <br>2-10 Movable crosshead position display |  |
| Display range                               | 5 1/2-digit digital display (with negative sign)   |
| Zero reset                                  | Minimum unit: 0.01 mm, maximum display: 1 999.99 mm  |
| Maximum/minimum settings                    | Zero can be reset to any position using the [RESET] key.<br>Digital display setting using function keys and cursor keys  |
| <br>2-11 Cycle testing function             |  |
| Standard function                           | Cycle testing is possible using position values, test force values, displacement values, or any combinations of these values.(Cycles using displacement values are controlled by the data processing software.)<br>Maximum number of cycles: 9 999 cycles; maximum cycle speed: 5 cycles/min                                     |
| <br>2-12 Sample break detection function    |  |
| Standard function                           | Detected when test force exceeds 7 % of full scale then suddenly decreases by more than ## % of current value or passes 5 % of test force full scale. Movable crosshead can be set to stop, reverse, or ignore when a rupture is detected. ## % can be set by the user using the function keys.<br>Setting range: 0.1 % to 9.9 % |

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|  |  |
|--|--|
| 2-13 Safety devices                        |  |
| Emergency stop switch                      | Cuts off power to the servo motors when activated.<br>(Locking switch)   |
| Load cell connection confirmation function | Stops the movable crosshead when no load cell is connected.  |
| Overload limit                             | Stops the movable crosshead if the test force reaches $\pm 102\%$ of the corresponding range full scale.   |
| Overscale limit                            | Stops the movable crosshead if the displacement value reaches $\pm 102\%$ of the corresponding range full scale.<br>(Optional: With displacement measurement function fitted)  |
| Operation standby function                 | Press the SET switch to turn on the power to the servo motors.(This sets the machine to standby mode.)   |
| Stroke limits                              | The movable crosshead movement upper and lower limit positions can be set by the user.<br>Power to the servo motors is cut off when activated.   |
| Servo amplifier emergency stop function    | Cuts off power to the servo motors when activated.   |
| Ball screw protective cover                | Standard feature: Prevents entrapment by the ball screw.   |
| Alarm functions                            | Display alarms when activated.<br>Emergency stop switch: E-STOP, Stroke limit: L-STOP<br>Operation standby OFF:S-STOP, Overload limit: OL/-OL<br>Overscale limit: OS/-OS<br>Load cell connection confirmation function: NC |
| 2-14 Test condition memory                 |  |
| Standard function                          | Stores up to 10 test conditions. Test conditions can be set automatically by calling up previously stored test conditions.   |
| 2-15 Test status retention                 |  |
|  | Retains settings when the power is turned off.<br>Note that the operating status is not retained.<br>(The moving crosshead remains stopped.)   |
| 2-16 Horizontal adjustment function        |  |
|  | Level adjusters are provided beneath the testing machine base to enable machine leveling.  |
| 2-17 External dimensions                   |  |
|  | Width 620 mm × Height 1 168 mm(*) ×Depth 370 mm<br>* Not including level adjusters<br>Space for connector cables at rear of testing machine : 150 mm   |
| 2-18 Weight                                |  |
|  | Approx. 70 kg  |
| 2-19 Power supply                          |  |
|  | Single-phase 100 V $\pm 10\%$ AC, 200 W  |

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2-20 Operating conditions      Temperature: 5 °C ~ 40 °C,  
Humidity: 20 % ~ 80 % (no condensation)

2-21 Standard accessories

|  |   |
|--|---|
| Tools                                    | 1 set<br>Tool box, hex wrench set, Phillips screwdriver                     |
| Fuse                                     | Midget fuse 1 A   |
| Grounding cable                          | 5 m ×1  |
| Power supply cable                       | 5 m ×1<br>100 V AC cable with 3-pin plug at one end<br>(with 2-pin adapter) |
| Instruction manual and certificate sheet | 1 copy each   |

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

- High test force accuracy (TGJ-LHP)  
± 0.5 % of indicated value
- Upper tensile model (TGJ-UT)  
Test space for tensile testing is located above the movable crosshead.
- Extended stroke model (TGJ-L\*\*0)  
Extends total testing machine length to \*\*0 mm.
- Chuck adapter (TGJ-CHB)  
Lower chuck mounting adapter for tensile testing  
Accessory tools      Chuck tightening hook ×1
- RS-232C interface (TGJ-232C)  
Connects to PC or other external device.  
Accessory      RS-232C cross cable  
(D-sub 9-pin female to D-sub 9-pin female, length: 3 m)  
USB/RS-232C adapter

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Recorder control function (TCA-003A)

Proportional chart feed function

Outputs chart feed signal to the recorder at preset ratio.

Ratio settings: ×20, ×10, ×5, ×2, ×1, ×0.5, ×0.2, ×0.1

Setting method Set using function mode.

Supports R-01A recorder.

Recorder control function

Outputs signal to synchronize recorder paper with movable crosshead.

Operation details The recorder paper is synchronized with the movable crosshead and fed forward during testing.

Remote controller (TG-RMT)

Handheld controller for external control

“STOP”, “TEST START”, “MANUAL UP”, “MANUAL DOWN”, “RETURN”, “MANUAL SPEED SELECT”

External dimensions (W × H × D)

80 mm × 125 mm × 30 mm

Cable length 2 m

Remote controller (TG-RMT-J)

Handheld controller for external control

“STOP”, “TEST START”, “MANUAL UP”, “MANUAL DOWN”, “RETURN”, “MANUAL SPEED SELECT”, “JOG DIAL”

External dimensions (W × H × D)

80 mm × 180 mm × 37 mm

Cable length 2 m

The remote controller requires an input/output of external contact (TGJ-I/O).

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### Universal Testing Machine

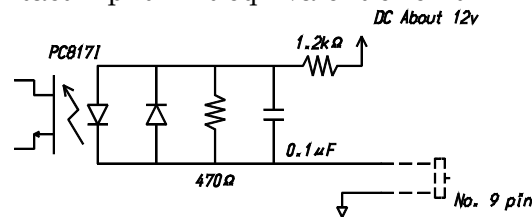
□ Input/output of external contact (TGJ-I/O)

- Contact input Allows external control of movable crosshead.  
 No. of contact inputs 6  
 Input signals "STOP", "TEST START", "MANUAL UP",  
 "MANUAL DOWN", "RETURN",  
 "MANUAL SPEED SELECT"

Control input connector layout (Supported plug: MR-25M)

| Pin number | Signal name         | Pin number | Signal name |
|------------|---------------------|------------|-------------|
| 1          | STOP                | 14         | N.C.        |
| 2          | TEST START          | 15         | N.C.        |
| 3          | MANUAL UP           | 16         | N.C.        |
| 4          | MANUAL DOWN         | 17         | N.C.        |
| 5          | RETURN              | 18         | N.C.        |
| 6          | N.C.                | 19         | N.C.        |
| 7          | N.C.                | 20         | N.C.        |
| 8          | MANUAL SPEED SELECT | 21         | N.C.        |
| 9          | COM                 | 22         |             |
| 10         |                     | 23         |             |
| 11         | N.C.                | 24         |             |
| 12         | N.C.                | 25         |             |
| 13         | N.C.                |            |             |

Contact input unit equivalent circuit



- Contact output Outputs contact information based on test status (operating status of movable crosshead).

No. of contact outputs 3

Output signals "TEST START", "RETURN", "STOP"

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Control output connector pin layout (Supported plug: MR-8F)

| Pin number | Signal name |
|------------|-------------|
| 1          | TEST START  |
| 2          | TEST START  |
| 3          | RETURN      |
| 4          | RETURN      |
| 5          | STOP        |
| 6          | STOP        |
| 7          | N.C.        |
| 8          | N.C.        |

Contact output unit equivalent circuit



Auto range function (TGJ-ARG)

Automatically switches to the next largest range when the test force reaches 95 % of the full scale.

\* This function is disabled when the data processing software is in use.

Position analog output (TGJ-ANG)

Function outputs movable crosshead displacement as an analog voltage.

Output setting One customer-selected output can be preset before product shipment.

Analog output cable (CAC-124S-2M)

BNC cable (Y connector at one end, 2 m)

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Displacement measurement function (TGJ-AMP-\*\*)

Input: Select one of the following:  
TGJ-AMP-01: Strain; 3 mV/V, applied voltage 3 V DC  
TGJ-AMP-02: Strain; 1.5 mV/V, applied voltage 3 V DC  
TGJ-AMP-03: Voltage; 0 V to 1 V DC  
TGJ-AMP-04: Voltage; 0 V to 5 V DC  
TGJ-AMP-05: Voltage; 0 V to 10 V DC

Display: 5-digit digital display (with negative sign)

Measurement range: 4 steps: 1, 2, 5, 10

Measurement accuracy:  $\pm 0.5$  % of corresponding full scale Note that accuracy may vary depending on the sensor used.

Auto zero function: Standard function

Auto calibration function: Standard function

Capacity evaluation function: Standard function

Measurement units: mm/cm

Analog output:  $\pm 5$  V DC (output connector: BNC female)  
Load resistance 5 k $\Omega$  or more, with scaling function  
Accuracy:  $\pm 0.5$  %F.S.  
Resolution: Approx. 1/4 000  
Cable: Optional

Simple creep testing function (TGJ-CRP)

Function for maintaining constant test force  
Testing continues until the operator presses the "Stop" key.

Setting method Set using testing machine function keys and cursor keys.

Auto load function (TGJ-ALC)

Function for maintaining a constant test force increase  
(Varies test speed.)

Setting method Set using testing machine function keys and cursor keys.

Cycle testing keep timer (TGJ-KTM)

Function for pausing while reversing during cycle testing  
(Pause duration: 5 to 500 seconds)  
The return can be set to "RAPID" for cycle testing.

Setting method Set using testing machine function keys and cursor keys.

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



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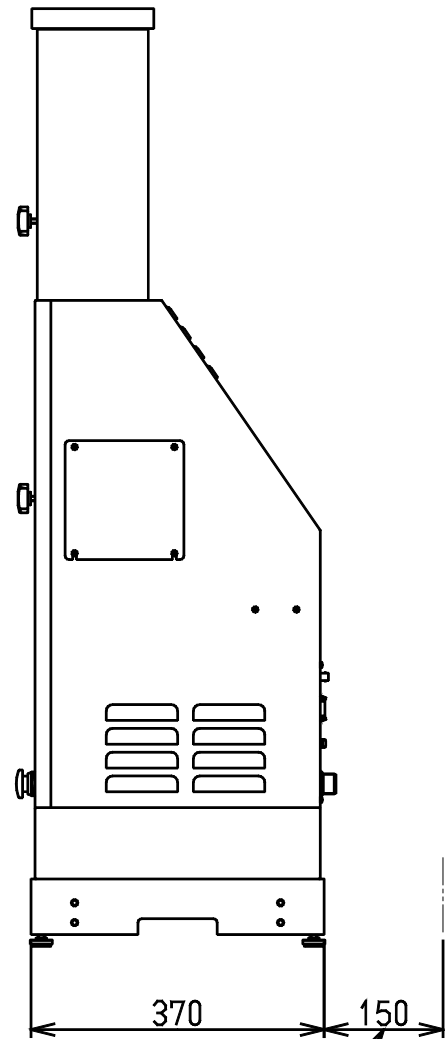
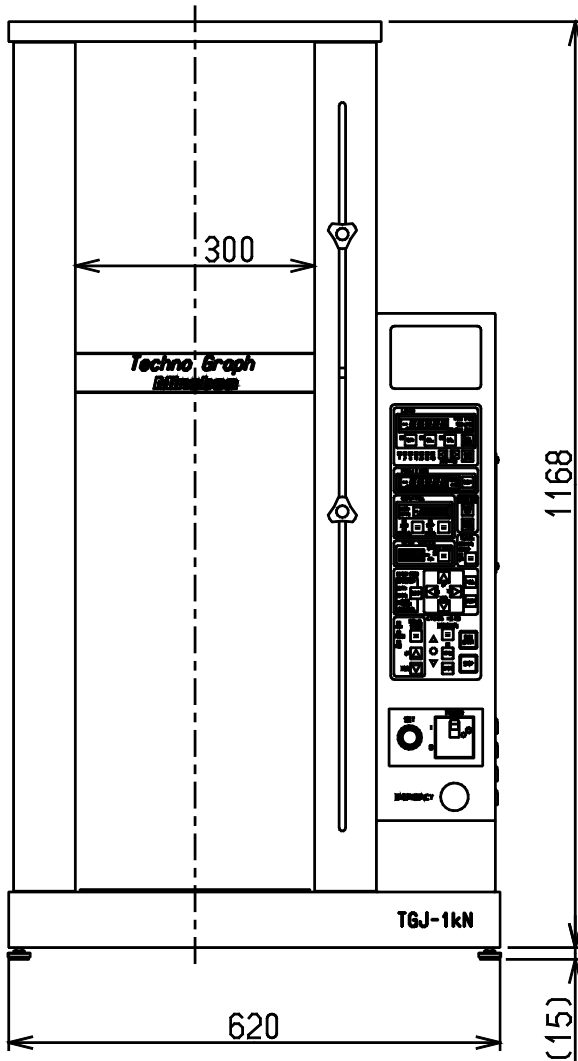
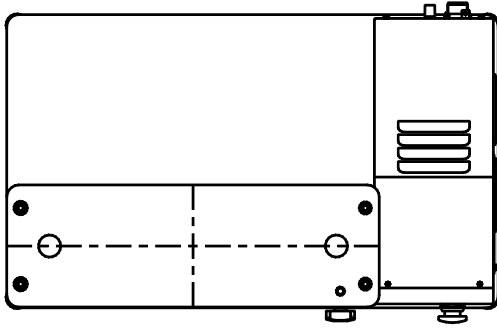
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Units: mm

Testing machine external appearance



Space for wiring and connectors

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Control panel external appearance

