

Servo Controller for Fatigue and Endurance System

Servo Controller 4830



Next Generation of Superb User Friendly Multi-Function Controller

Drastically enhances the accuracy of endurance and dynamic testing on materials and actual specimens

SERVOPULSER

SERVO CONTROLLER

4830

The 4830 Controller serves as a multi-function, superb user friendly controller for servo-controlled materials testing machines. This controller offers all the functions and performances needed for the control and measurements in the testing of static and dynamic characteristics of materials, actual objects, or structures.

The 4830 Controller incorporates full digital control of all elements, including waveform generation, automatic gain control (AGC)*, hydraulic operation circuits, alarm functions, measurement amplifiers (test force and displacement), settings and display in engineering units, shockless control switching, and servoamplifiers.

The 4830 Controller LCD touchpanel improves compactness and ease-of-operation. The controller can be operated using the combination of the LCD touchpanel, function keys, numeric keys, or the jog dial that offers the sensation of analog operation. The operation screens are arranged by function and can be selected by extremely simple, one-touch operation of the function keys.

The 4830 Controller permits USB interface connection to PC (optional softwares required). This allows the synchronous test operation and waveform distortion correction of up to four units.

Note* This function automatically adjusts the setting signals to correct the amplitude.



Features

Load waveform generation with excellent reproducibility

Full digital controller with control parameter functions like autotuning and waveform distortion correction (note *1) to achieves true load waveform reproduction.

Synchronous testing with up to four testing machines

Synchronous connection of controllers permit testing with up to four actuators. The phase correction function incorporated in the controller allows constant control of the phase difference between the feedback signals.

Test force control for specimens with “free play” characteristics.

Achieves stable peak-value test force control for specimens where no test force is applied by using the automatic displacement control.

World-class basic performance

The 24-bit high-resolution AD converter and detector-output linearization function achieve $\pm 0.5\%$ indicated-value accuracy with a standard system (note *2).

Ease of operation

The controller is extremely user friendly to operate with function keys and graphical user interface on the color LCD touchpanel. The quick, interactive operation style allows even novices to operate the system within a short time.

Waveform display functions

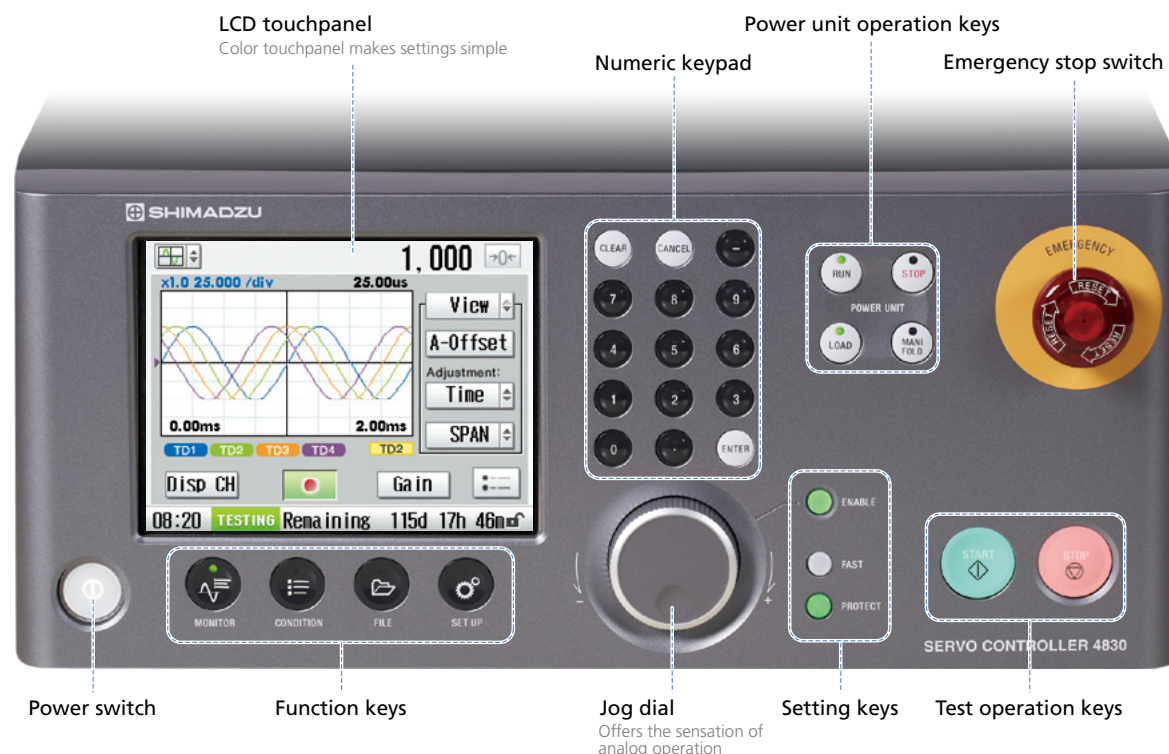
Loading waveform display functions permit real-time display of time graphs, X-Y graphs, and peak graphs that permits digitally readout from these graphs.

USB interface

USB interface connection to PC significantly enhances performance (optional softwares required).

Note*1 Requires optional Windows software

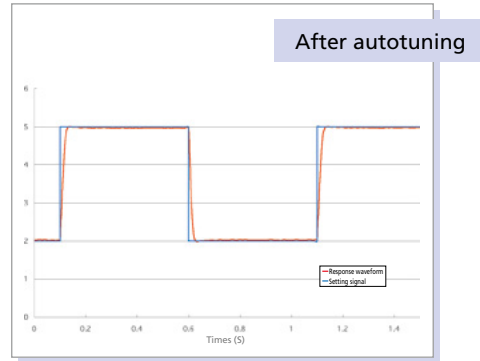
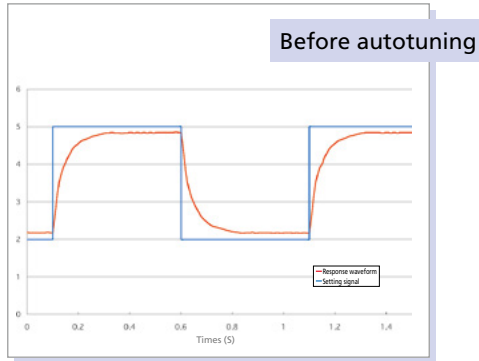
*2 Incorporating standard Force Simulator or Servopulser E Series, U Series, or L Series.



Drastically Enhances Load-waveform Reproducibility

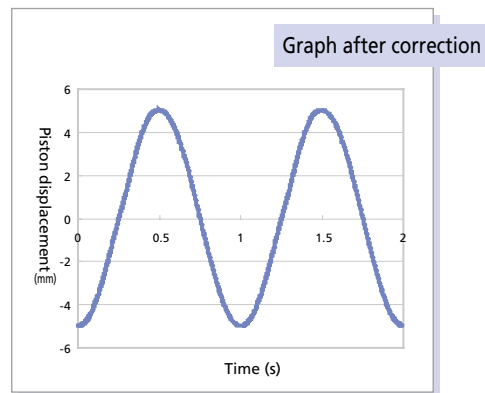
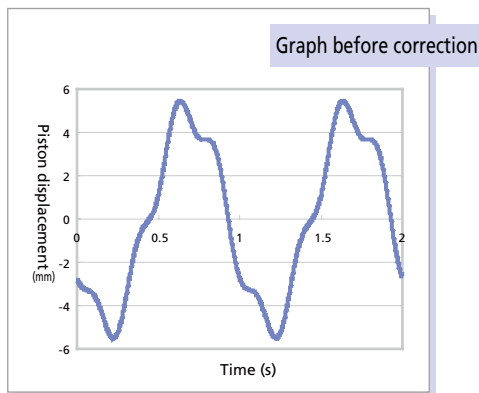
Autotuning

Automatically determines the control parameters, which were previously based on operator's experience and pre-testing every time there is changed in specimen or test conditions.



Waveform Distortion Correction*

This function uses FFT to correct the amplitude and phase frequency components to achieve true load waveform reproduction when the waveform becomes distorted due to the specimen properties or time variations.



Note* Requires optional Windows software

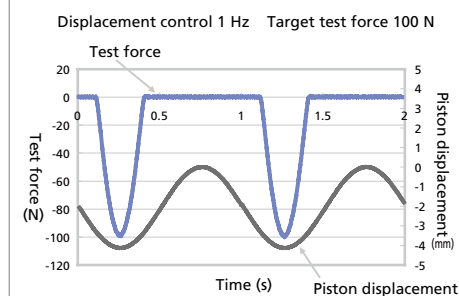
Test Force Control for Specimens with "Free Play" Characteristics

Permits Uniform Load "Push" Testing

Stability of test force control was previously not possible due to specimens with "free play" characteristics. The 4830 Controller automatically adjusts the displacement control until the set test force is reached. It permits uniform load testing using the desired test-force peak value.



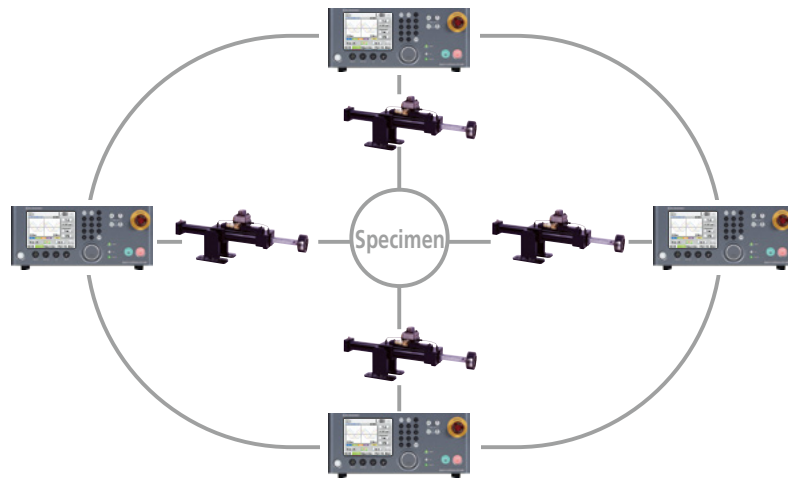
Example of uniform load "push" testing



Synchronous Testing with up to Four Testing Machines

Synchronous Testing

Simultaneous connection of controllers permit synchronous control and measurements with up to four actuators.

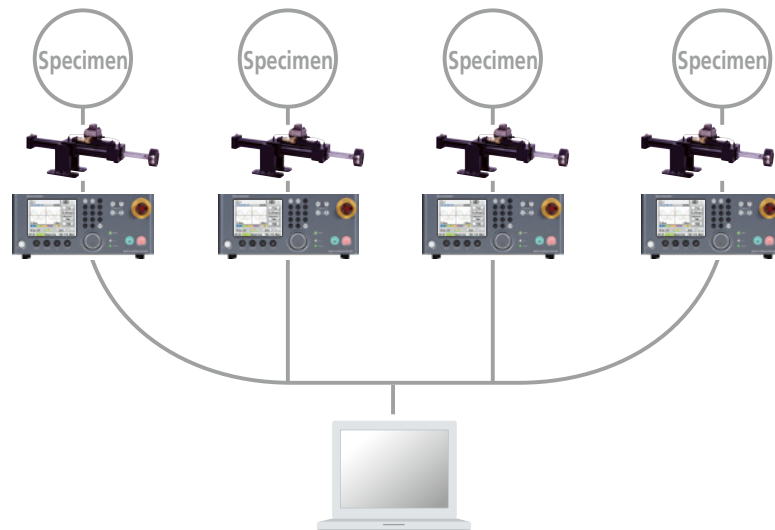


Each actuator phase can be set as required.

Multiple Tests

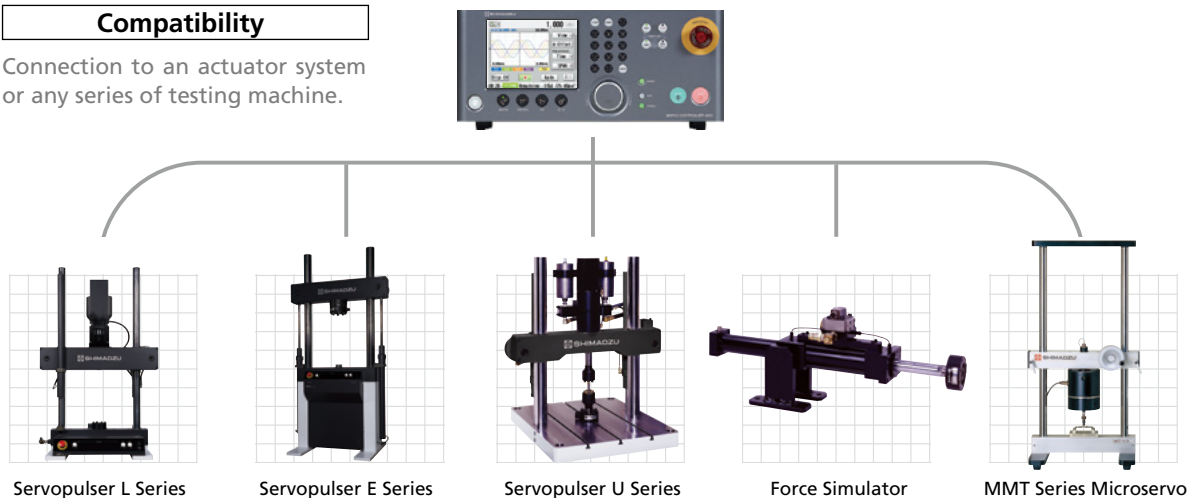
Simultaneous up to 4 Tests

Up to four tests, each with different test conditions, can be conducted simultaneously using a single PC. For example, collect peak values and cycle data from four endurance tests running in parallel. (Requires optional Windows software.)



Compatibility

Connection to an actuator system or any series of testing machine.



User Friendly Functions From Test Setup to Completion



01

Test Setup

When mounting a specimen, the jog dial controls the piston with the function of analog operation. The touch-load function* prevents overloading of the specimen during mounting.

* This function monitors test loads to prevent overloading.



02

Setting Test Conditions

Interactive touchpanel operation simplified test conditions settings

The test-condition registration functions allow tests to be conducted with preset test conditions.

User friendly interactive settings

Condition

Repeat	Control	TD1
Max	50.000 kN	
Min	-50.000 kN	
1000.0 Hz	10,000,000,000	
WaveStop		

Limit

TD1	200.00
TD1	10.000

Wave Load Cycle Option

ControlCH: TD1

MAX: 50.000 kN

MIN: -50.000 kN

Phase 0 deg.

OK Cancel

Current:

TD1	50.000kN	1000.0 Hz
TD1	-50.000kN	10,000,000,000

1~3 4~6 7~9

1	TD1	50.000kN	1000.0 Hz
2	TD2	10.000mm	1.0000 Hz
3	TD2	2.0000mm	10,000,000,000

08:20 STOP ERR: 100.00%

Simply select a file to display the easy to read test-condition listings.

03

Testing

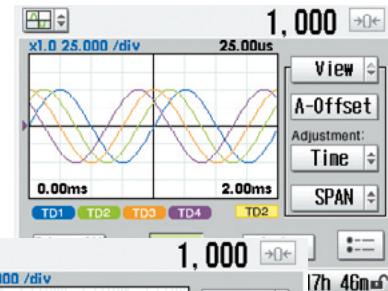
Numeric values or waveform can be displayed during test. Waveform display allows observation of the specimen condition during test as time graph, X-Y graph, or peak graph.

Numeric display

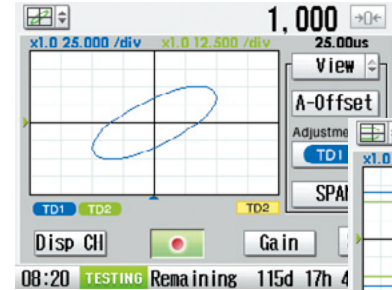


Waveform display

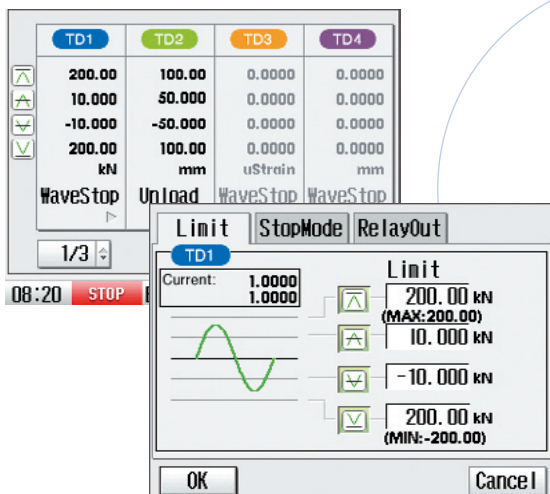
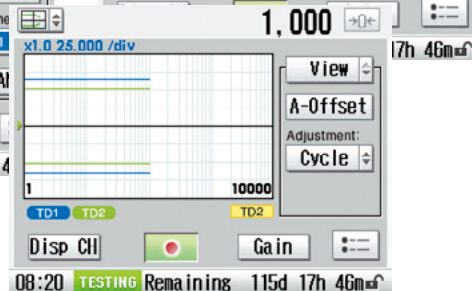
Time graphs



X-Y graphs



Peak graphs



Test Completion

The test completes upon achieving the preset limit condition such as achieving excessive measured value or the number of cycles. The stop mode function is selectable for power unit stop, waveform stop, waveform zero, displacement hold, unload, or manifold off during test completion. These stop modes protect the specimen during test completion.

Software Further Enhances Test Performance

The dedicated software for the Servo Controller 4830 consists of basic software, add-on testing software, and GLUON 4830 fracture toughness testing software.

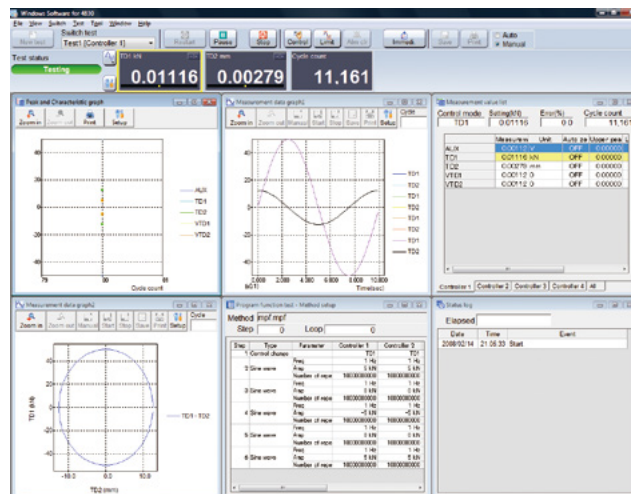
*Windows software is optional

Basic Software	Fatigue and Endurance Testing
	Program Function Testing
	Static Characteristics Testing
	Combination Testing
Add-On Software Note: Requires basic software	Static Testing
	Frequency-Sweep Testing
	Resonance Frequency Tracking Testing
	Multi-Axis Combination Sine Wave Testing (without waveform distortion correction)
	Multi-Axis Combination Sine Wave Testing (with waveform distortion correction)
GLUON 4830	Multi-Axis Working Waveform Simulation Testing
	Crack Propagation Testing Software
	KIC/COD Testing Software
	JIC Testing Software

Windows Software for 4830

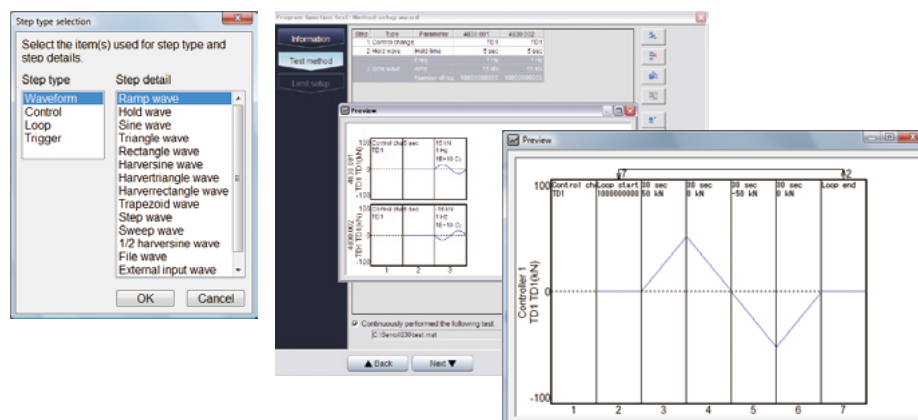
Setup Is Made Easy

The clear and user-friendly interface makes software operation easy.



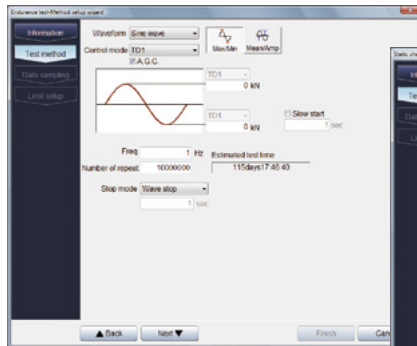
Programmable Waveforms (Program Function Testing)

Combination of ramp, sine and other waveforms with testing based on waveform data such as actual waves further extends the range of test applications.

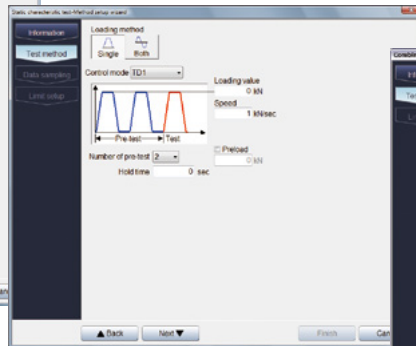


Endurance and Static-characteristics Testings

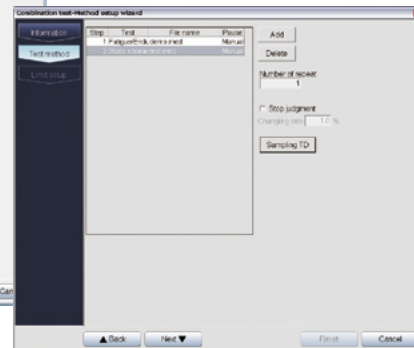
Apart from the controller, the software permits independent or continuous testing. Continuous testing is with the combination of endurance and static-characteristics testing.



Endurance testing



Static-characteristics testing



Combination testing

Setting made easy with wizard

Even beginners or novices can easily and accurately set the test conditions by following the Test Condition Wizard procedures.

Mail notification

The mail notification function reduces the daily monitoring workload. It sends email at pre-determined intervals during testing or when testing stops due to alarm.

USB interface

The USB interface permits easy plug & play connection to Notebook or Desktop PC.

■ GLUON 4830 -fracture toughness testing software

- Crack Propagation Testing Software
- KIC/COD Testing Software
- JIC Testing Software



Main Specifications		
Model		4830
P/N		347-39536
Loading waveform	Standard waveforms	Sine, triangular, rectangular, haversine, havertriangular, haver-rectangular, trapezoidal, 1/2 haversine, ramp, step, sweep, random, external input
	Optional waveforms* ¹	Combination and file waveforms (any wave)
	Frequency	0.00001 to 1000 Hz
	Ramp rate	10 ⁻⁹ to 100 FS/s
	Hold time	0 to 10 ⁹ s
	Cycle counter	10 ¹⁰
	Test-condition registration	9 types max.
Measurement amplifiers	Type	Test force, displacement amplifiers (2 additional optional amplifiers can be added)
	Range	24-bit, rangeless
	Functions	Auto-zero, auto-recognition, auto-calibration, virtual transducer* ⁴
Measurement functions*A	Sampling frequency	40 kHz max. * ²
	No. of sampling channels	8 CH max. * ²
	No. of sampling points	10000 data/channel max. * ³
Control functions	Control method	Full digital correction control
	Controlled values	Test force, stroke, virtual transducer * ⁴ (2 channels can be added as options)
	Functions	Automatic gain control (AGC)* ⁵ , autotuning, shockless control switching, touch-load function* ⁶ , waveform distortion correction*, uniform load “push” test function
	Synchronous control	Up to 4 units (phase difference: 0 to 359°)
Power unit functions	Power unit	Start, stop, pressure rising, manifold ON/OFF
Operation and display components	Display panel	5.7" color LCD
	Waveform display	Time graph, X-Y graph, peak graph
	Operation keys	Touch panel, power unit operation keys, function keys, numeric keys, jog dial, test operation keys, emergency stop switch
Limit functions (safety features)	Type	4-point limiter* ⁷ , power unit alarm, counter, external alarm
	Stop modes	Power unit stop, waveform stop, waveform zero, waveform mean value, unload, position hold
Signal I/O	Analog	4CH (±10 V) output; 1CH (±10 V) input
	Digital	8CH output; 8CH input
Communication functions	USB 1.0 full-speed (12 Mbps)	
General performance (standard configuration) *B	Test force accuracy	±0.5% indicated value or ±0.02% dynamic rating, whichever is greater
	Displacement accuracy	±1.0% indicated value or ±0.1% rated value, whichever is greater
	Control stability	Within ±0.1% rating for controlled amount
Size and weight	Dimensions (mm)	W350 x D420 x H148 mm *Height 165 mm including protrusions.
	Weight	Approx. 8 kg
Power supply	100 to 230 VAC, 50/60 Hz, 300 VA* ⁸	

Note *1 When using software.

*2 4 CH maximum at sampling frequency of 1 kHz or higher.

*3 Using software. Controller alone stores up to 1000/CH data.

*4 Measurement and control based on the sum, difference, and mean values of measured values.

*5 This function adjusts the setting signals to correct the amplitude.

*6 This function monitors the test forces to prevent overloading.

*7 Upper and lower limits and reduced amplitude values can be set for the measured values.

*8 Power cable main plug is for 100 VAC only.

*A Optional Windows software required to store measured data.

*B Servopulser E Series, U Series, L Series, or Force Simulator standard system.

Standard Configuration

1	Controller unit	1
2	Power cable	1
3	DC amplifier (internal, for test forces)	1
4	AC amplifier (internal, for strokes)	1
5	Servoamplifier (internal)	1
6	CAL cable (for DC amplifier)	1
7	CAL cable (for AC amplifier)	1
8	Digital I/O connector	1
9	Alarm connector	1
10	Spare fuse	2
11	LCD panel protective sheet	2
12	Instruction Manual	1

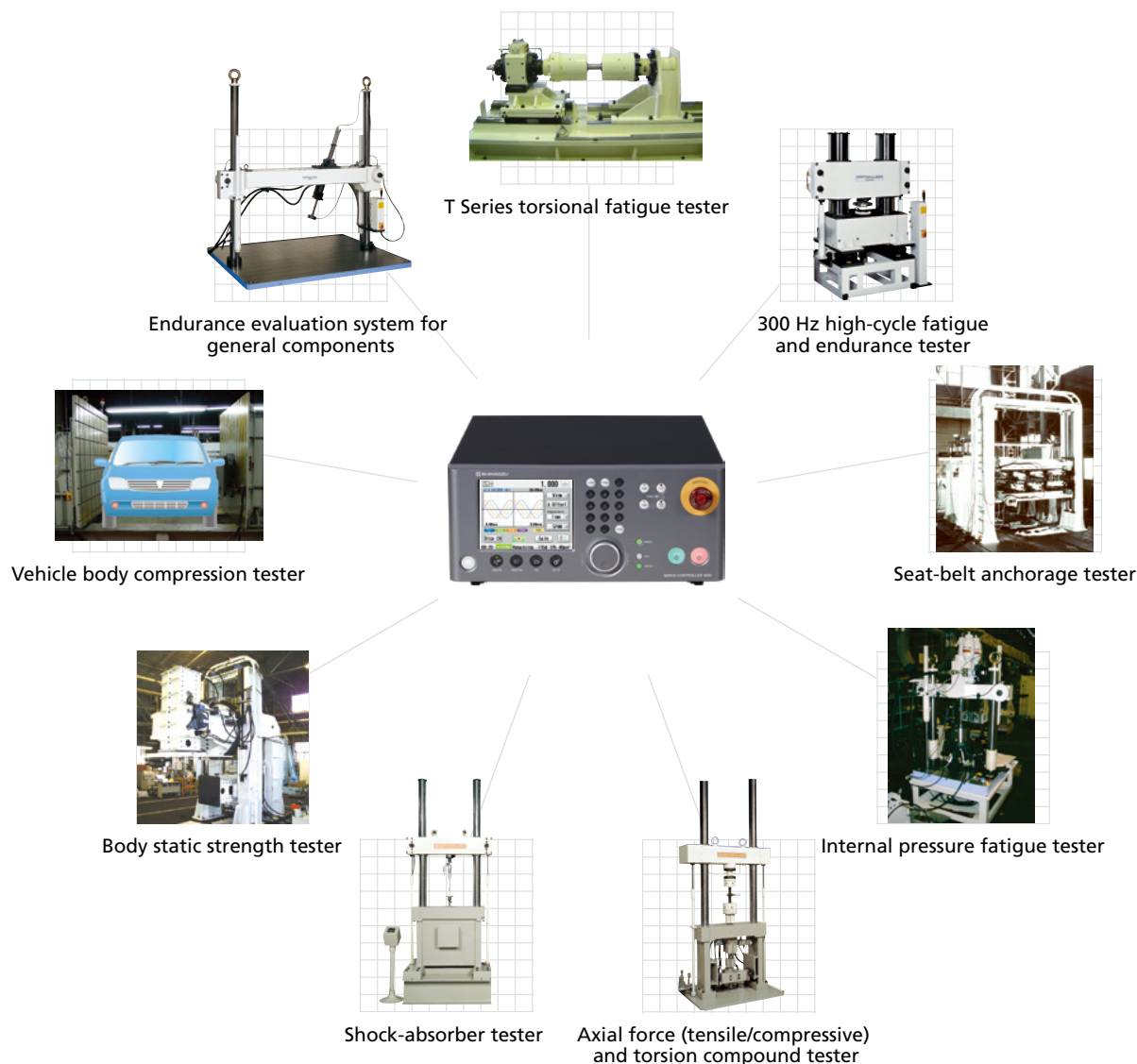


Options

Name	P/N	Model
Windows software for 4830	347-39703	SW30-STDE
DC amplifier	347-39503-41	AMP30-DC
AC amplifier	347-39503-42	AMP30-AC
VIN amplifier	347-39503-43	AMP30-VIN
VINS amplifier	347-39503-44	AMP30-VINS
Servoamplifier	347-39504-40	AMP30-SV
Sync PCB	347-39505-40	BDA30-SYNC
Hydraulic supply cable (3m)	347-39527-43	CBL30-HYD-03M
Hydraulic supply cable (5m)	347-39527-45	CBL30-HYD-05M
Hydraulic supply cable (7m)	347-39527-47	CBL30-HYD-07M
Hydraulic supply cable (10m)	347-39527-51	CBL30-HYD-10M
MMT control cable (1m)	347-39528-41	CBL30-MMT-01M
MMT control cable (2m)	347-39528-42	CBL30-MMT-02M
MMT control cable (5m)	347-39528-45	CBL30-MMT-05M
Sync cable (terminator)	347-39530	CBL30-SYNC-TM
Sync cable (1m)	347-39530-41	CBL30-SYNC-01M
Sync cable (2m)	347-39530-42	CBL30-SYNC-02M
Sync cable (3m)	347-39530-43	CBL30-SYNC-03M
Sync cable (5m)	347-39530-45	CBL30-SYNC-05M
Analog I/O cable (1m)	347-39531-41	CBL30-AIO-01M
Analog I/O cable (2m)	347-39531-42	CBL30-AIO-02M
Analog I/O cable (3m)	347-39531-43	CBL30-AIO-03M
Analog I/O cable (5m)	347-39531-45	CBL30-AIO-05M
CAL cable for DC amplifier	347-39534-40	CBL-CAL-DC
CAL cable for AC amplifier	347-39534-41	CBL-CAL-AC
CAL cable for magnetostrictive sensor	347-39534-42	CBL-CAL-VINS
CAL cable for capacitive displacement gauge	347-39534-43	CBL-CAL-ACC
Sensor cable for DC amplifier	347-39906-45	CBL-SENS-DC-05M
Sensor cable for AC amplifier	347-39907-45	CBL-SENS-AC-05M
Sensor cable for capacitive displacement gauge	347-39908-45	CBL-SENS-C-05M
Servo-valve cable (5m)	347-39909-45	CBL-HYDSV-05M

SERVO CONTROLLER 4830

Testing Systems for Automobile



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