

Universal servo-hydraulic
systems for dynamic testing

Servopulser Series



High-precision systems for static and dynamic testing

1 Accuracy

The highly rigid main frame, powerful digital controller electronics and Shimadzu's specially developed servo valve ensure testing accuracy with high reproducibility.

2 Safety

Special safety features and an emergency stop button make operation safe for the user.

3 Continuously changing forces and speed

High performance servo valve allows instant change of test force and speed.

4 Multifunctionality

The system consists of a main frame, a controller and a hydraulic station. Depending on the user's goals and tasks, the frame power and the required grips are selected.

5 Compactness

The system is designed to make the most economical use of laboratory workspace.

6 Highly rigid frame

The increased rigidity of the main frame guarantees trouble-free operation of the testing machine, and also ensures reliable fixation of the sample and prevents its longitudinal bending.

With the appropriate machine configuration and equipment, various material properties can be determined, such as:

- ▶ Modulus of elasticity
- ▶ Tensile, compressive and bending strength
- ▶ Wear characteristics
- ▶ Resistance to crack propagation
- ▶ Fatigue strength
- ▶ Deformation characteristics in static mode
- ▶ Thermal fatigue of materials
- ▶ Creep and elastic-plastic properties and much more.

Load frames

Load frame type L



Tabletop modification of the testing machine with an overhead actuator

Due to the upper actuator position, the testing machine can be used for testing finished products and fairly large samples, despite the relatively low power (max. 20 kN). Optionally, the machine is equipped with a lower base plate with T-slots. The following hydraulic stations are suitable for this type of frame: QF-10B, QF-20B, AF-4, AF-10B, AF-20B. Main application: structural elements and finished products made of various materials.

Specification

Model	Stroke, mm *	Max. dynamic/static test force, (kN)	Frame stiffness, (mm/kN)**	Traverse movement mechanism
L5 kN	± 25	± 5 / ± 6	0.0033	Hydraulic drive (with hydraulic grip)
	± 50			
L10 kN	± 25	± 10 / ± 12		
	± 50			
L20 kN	± 25	±20 / ±26		
	± 50			

* Machine delivery with a stroke of ±100 mm is possible

** With a distance between the crossbar and the base of 300 mm.

Load frame type E



Floor modification of the testing machine with a lower actuator location

The most popular model. Maximum capacity 200 kN. Does not require large installation space. Highly rigid frame prevents longitudinal bending of the sample and reduces energy losses due to frame deformation.

Main application: testing of metals and plastics.

Specification

Model	Stroke, mm *	Max. dynamic/static test force, (kN)	Frame stiffness, (mm/kN)**	Traverse movement mechanism	
E051 kN	± 25	± 50 / ± 60	0,0012	Hydraulic drive (with hydraulic grip)	
	± 50				
E101 kN	± 25	± 100 / ± 120			
	± 50				
E200 kN	± 25	±200 / ±240			0.00065
	± 50				

* With a distance between the crossbar and the base of 500 mm.

** The machine can be supplied with a fixed type crossbeam.

U type loading frame



Floor modification of the testing machine with an overhead actuator

This model is designed for testing large-sized samples. Maximum capacity is 200 kN. The machine can be supplied with increased column height. The machine is equipped with a lower base plate with T-shaped slots. Main application: structural elements and finished products made of various materials.

Specification

Model	Stroke, mm *	Max. dynamic/static test force, (kN)	Frame stiffness, (mm/kN)*	Traverse movement mechanism **, ***
U50 kN	± 25	± 50 / ± 60	0.0025	Hydraulic drive (with hydraulic grip)
	± 50			
U100 kN	± 25	± 100 / ± 120	0.0019	
	± 50			
U200 kN	± 25	±200 / ±240	0,0009	
	± 50			

* With a distance between the crossbar and the base of 500 mm.

** Separate drive for the crossbar and clamp stand.

*** The machine can be supplied with a non-vertical lifting device.

Hydraulic stations

Hydraulic pump station QF series (water cooling)

The hydraulic pumping station is specially designed for use with testing machines of this type.

- Low noise level
- 3 micron filtration
- Compactness (due to the vertical arrangement of the pump and motor)



Specification

Model		QF-10B	QF-20B	QF-40B	QF-70B	QF-110	QF-140
Appropriate testing machine	E type	○	○	○	○	○	○
	U type	○	○	○	○	○	○
	L type	○	○				
Approx. pump capacity (l/min)	50 Hz	9	19	42	68	108	134
	60 Hz	11	24	51	81	104	162
Normal oil pressure (MPa)		21					
Hydraulic fluid		MOBILE DTE25					
Pump	Model	constant displacement hydraulic pump					
	Quantity	1			2		
Engine power (kW)		5.5	11	22	37	45	37 x 2
Oil filter		3 microns					
Tank capacity (l)		90	90	190	300	500	590
Noise level (at 21 MPa) (dBA)		65	71	76	76	83	85
Requirements by power supply*, (kVA)	100V, single phase	1.5					
	200/220 V, 3 phases	8	16	32	47	57	93
Cooling water consumption (l/min)		20	20	65	80	110	150
Cooling tower capacity (cooling ton)		2	3	5	10	20	20
Approximate dimensions (mm)	Width	830	920	1100	1200	1730	1950
	Length	750	750	860	1000	1290	1500
	Height	1235	1235	1400	1515	1370	1550
Weight (including liquid) (kg)		530	530	720	920	1500	2200

* Modification to European power supply standard is possible.

Hydraulic pump station AF series (air cooling)

- Very low noise level
- Does not require water for cooling

Specification

Model		AF-4	AF-10B	AF-20B
Appropriate testing machine	E type		○	○
	U type		○	○
	L type	○	○	○
Approx. pump capacity (l/min)	50 Hz	3.7	9	19
	60 Hz	4.5	11	24
Normal oil pressure (MPa)		21		
Hydraulic fluid		MOBILE DTE25		
Pump	Model	constant pressure hydraulic pump with high productivity		
	Quantity	1		
Engine power (kW)		2,2	5,5	11
Oil filter		3 microns		
Tank capacity (l)		0,1	0,1	0.2
Noise level (at 21 MPa) (dBA)		3 microns		
Requirements by power supply*, (kVA)	100V, single phase	24	90	90
		56	64	71
Cooling water consumption (l/min)		1.5		
Cooling tower capacity (cooling ton)		3.5	8	17
Approximate dimensions (mm)	Width	800	870	870
	Length	770	900	900
	Height	700	1700	1700
		185	630	630



* Modification to European power supply standard is possible.

Controller 4830

New generation of controllers. Reliable, multifunctional, easy-to-use controller for the full range of materials testing.



Create a wave with excellent reproducibility

Fully digital control with automatic adjustment of control parameters, waveform distortion correction function.

Special functions ("push" function) for testing real objects

Stable control of peak values in all test areas (even when sample compliance changes).

High accuracy and reproducibility of results

Thanks to the high-resolution 24-bit AD converter and the detector output linearization function, a loading accuracy of 0.5% is achieved for standard systems.

Waveform display functions

These functions, installed as standard, allow you to display time graphs, XY graphs and peak graphs.

Technical specifications

Waveform	Standard type	Sine, Triangle, Rectangle, Haversine, HaverTriangle, HaverRectangle, Trapezoid, 1/2 Haversine, Sawtooth, Oscillation, Irregular, External Input Combination*, From File (Any Shape)*
	Frequency	0.00001 – 1000 Hz
Measurement amplifiers	Type	Load amplifiers, test progress (2 optional amplifiers can be added additionally)
	Range	24 bit resolution
Control	Type	Fully digital closed-loop control (two degrees of freedom PID)
	Correction	Automatic amplitude/average correction (AGC), automatic tuning, shock-free control switch, touch-load function, waveform distortion correction*, "push" function
	Synchronous control	Up to 4 blocks
Signal input/output	Analog	Input: 1 channel (± 10 V); Output: 4 channels (± 10 V)
	Digital	Input: 8 channels; Output: 8 channels
Security features	Types	4-position limiter, power supply overload alarm, counter, external alarm
	Stop modes	Power off, wave signal stop, wave reset, unload, hold position
Power requirements	100-230/240V AC, 1 phase, 50/60Hz, 300VA	

* when using optional software



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