25kN, 50kN, 100kN, 250kN

With support
25kN, 50kN, 100kN, 250kN

500kN

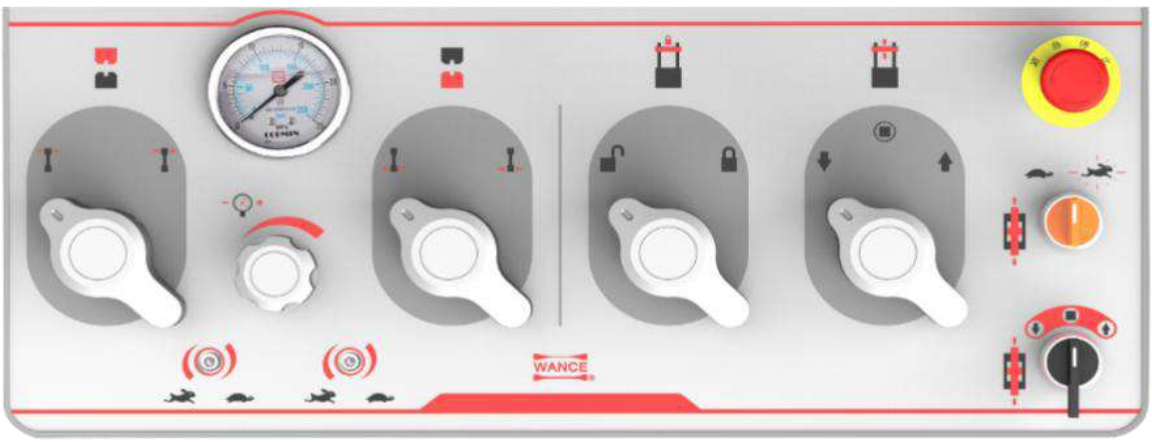
Floor-standing servo hydraulic dynamic testing machine is ideal for testing components and materials such as plastics, elastomers, aluminum, composites, steel, super alloys and more.

» High cycle fatigue
» Low cycle fatigue
» Advanced low cycle fatigue
» Fatigue crack growth
» Fracture toughness
» Crack propagation
» K_{Ic}, J_{Ic}
» Environmental testing
» Thermal mechanical fatigue

- The high-low cycle fatigue test can output sine wave, triangular wave, trapezoidal wave and other waveforms.
- With different fixtures, it can address the loading mode such as tension, compression, tension-compression.
- With additional devices, tests under high / low temperature, salt spray and corrosion are also supported.
- The closed-loop servo control system is composed of controller, servo valve, force transducer, displacement transducer and computer to realize PID control, and automatically measure test parameters such as force, displacement and deformation. The test process is all controlled by computer, which is an ideal cost-effective test system for scientific research institutes, metallurgical construction, national defense, colleges and universities, machinery manufacturing, transportation and other industries.

Load frame

- The machine is designed with closed-type structure, with high stiffness, backlash free, and excellent stability.
- The column surface is treated with high frequency hardening. Extra-high hardness ensures smooth guide, not easy to be scratched. The surface is chrome plated with super anti-rust ability.
- Crosshead lifting and lowering, and locking are hydraulically driven by the handle, flexible and convenient; the crosshead has a self-locking function to prevent sliding even shutdown.
- The alignment fixture is equipped to enhance system precision and test accuracy.
- Integrated actuator beam features more compact, less joints, and better rigidity.
- Servo actuator adopts clearance seal, no high pressure seal ring, and seals hydraulic oil by minimal and ultra-high precision clearance. Piston runs smoothly with very low damping coefficient, no crawling phenomenon, smooth curve, and a very high response frequency.
- Intuitive centralized controls provide with easy-to-turn handles and clear, universally understood labeling.



Parameters

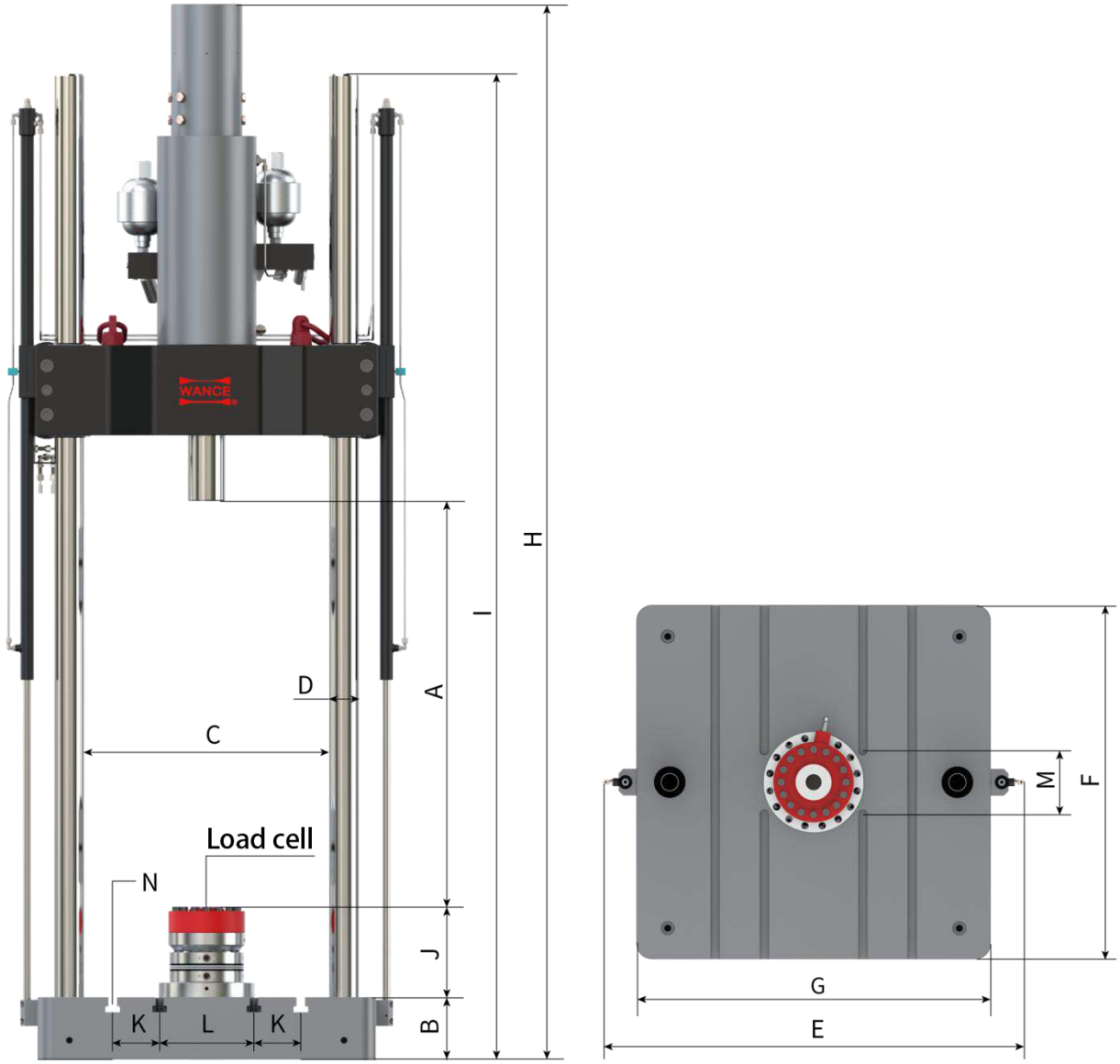
Model	HDT254A	HDT504A	HDT105A	HDT255A	HDT505A
Force capacity (kN) (rated dynamic force)	25	50	100	250	500
Force measurement range (kN) (2%~100%FS)	0.5~25	1~50	2~100	5~250	10~500
Static force accuracy	±0.5%				
Dynamic force accuracy	±1.5%				
Actuator stroke (mm)	150				
Displacement range (mm)	0~150(±75)				
Displacement resolution (mm)	0.001				
Displacement accuracy	⩽3mm, 0.015mm >3mm, ±0.5%FS				
Test frequency (Hz, Sine wave)	0.01~60				
Standard frame, A(mm)	150~1520	150~1520	150~1520	250~1620	380~2050
Extended frame, A(mm)	550~1920	550~1920	550~1920	650~2020	/
T-slot table height, B(mm)	135	135	135	165	220
Distance between columns C(mm)	550	550	550	650	760
Column diameter, D(mm)	80	80	80	80	100
Machine width E(mm)	970	970	970	1070	1300
T-slot table length, F(mm)	800	800	800	900	1100
T-slot table width, G(mm)	800	800	800	900	1100
Standard frame height, H(mm)	2910	2910	2910	3170	3990
Extended frame height, H(mm)	3410	3410	3410	3570	/
Standard frame height, I(mm)	2105	2105	2105	2620	3010
Extended frame height, I(mm)	2595	2595	2595	2710	/
Load cell height, J(mm)①	180	180	180	237	307
T-slot distance, K(mm)	100	100	100	125	150
T-slot distance, L(mm)	200	200	200	250	300
T-slot distance, M(mm)	0	0	0	160	240
T-slot bolt	M16	M16	M16	M20	M20
Stiffness, N/m	5×10^8	5×10^8	5×10^8	5.4×10^8	7.8×10^8
Standard frame weight, (kg)②	1150	1150	1200	1900	4050
Extended frame weight (kg)③	1190	1190	1240	1940	/
Support weight	73	73	73	103	/

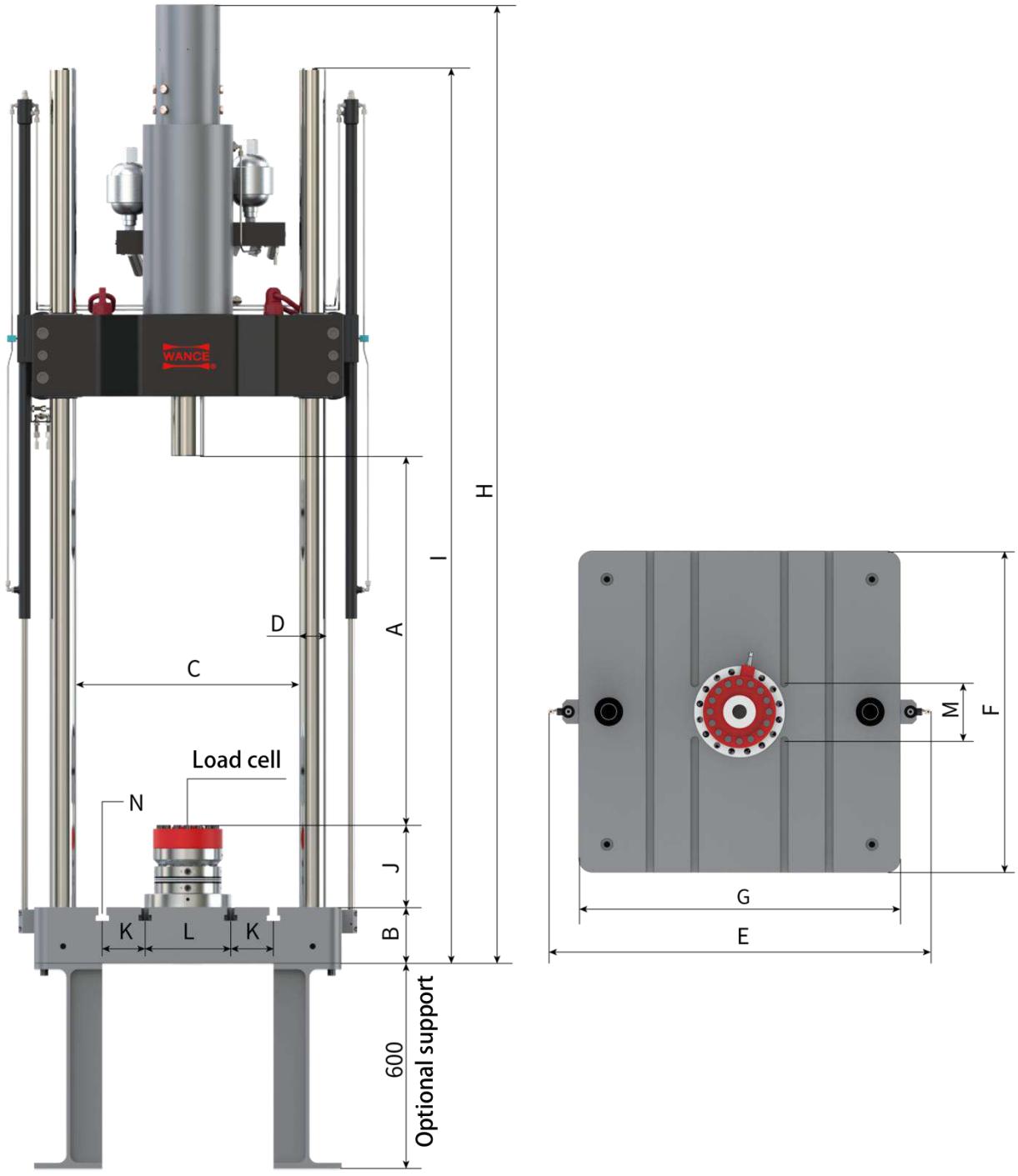
Note:

① This dimension includes alignment device height.

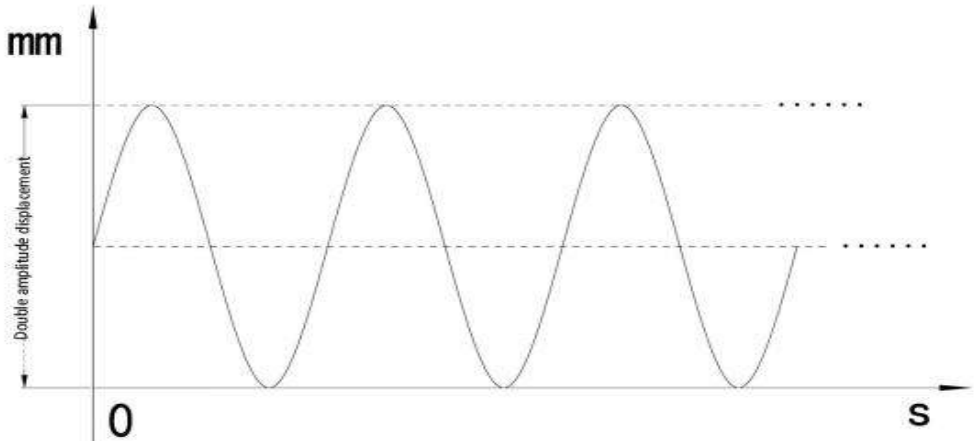
② Not including grips, and support weight

③ Not including grips, and support weight


WANCE
H
I
A
D
C
Load cell
N
J
B
K
L
K
M
F
G
E

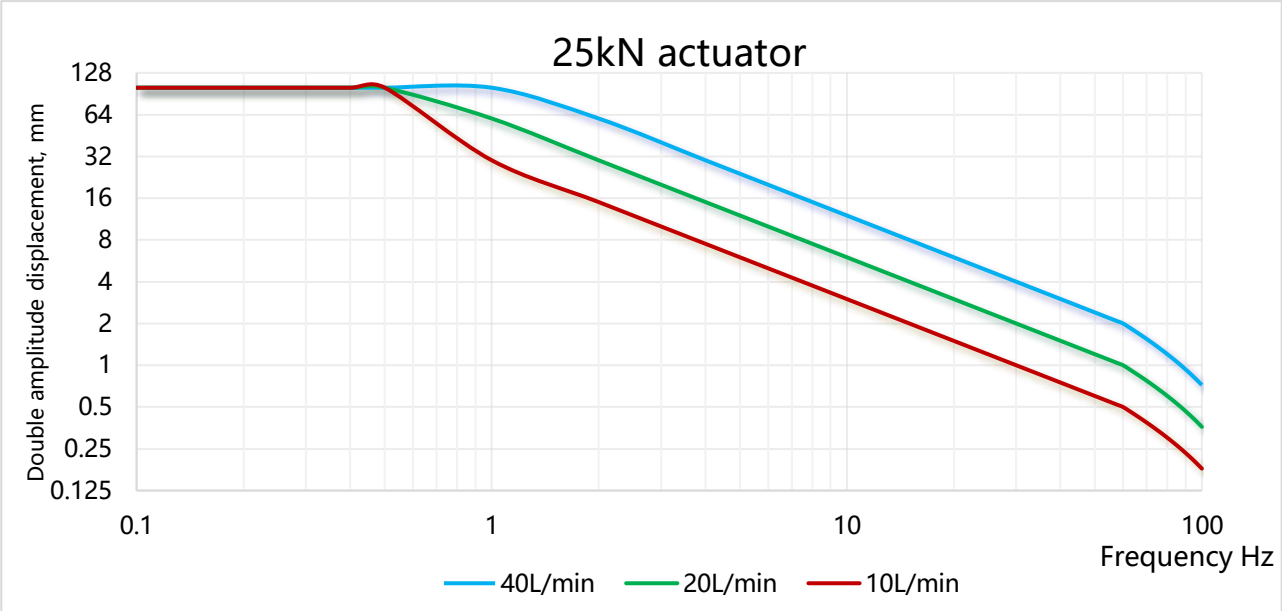

WANCE
H
I
A
D
C
Load cell
N
J
B
K
L
K
600
Optional support
M
F
G
E

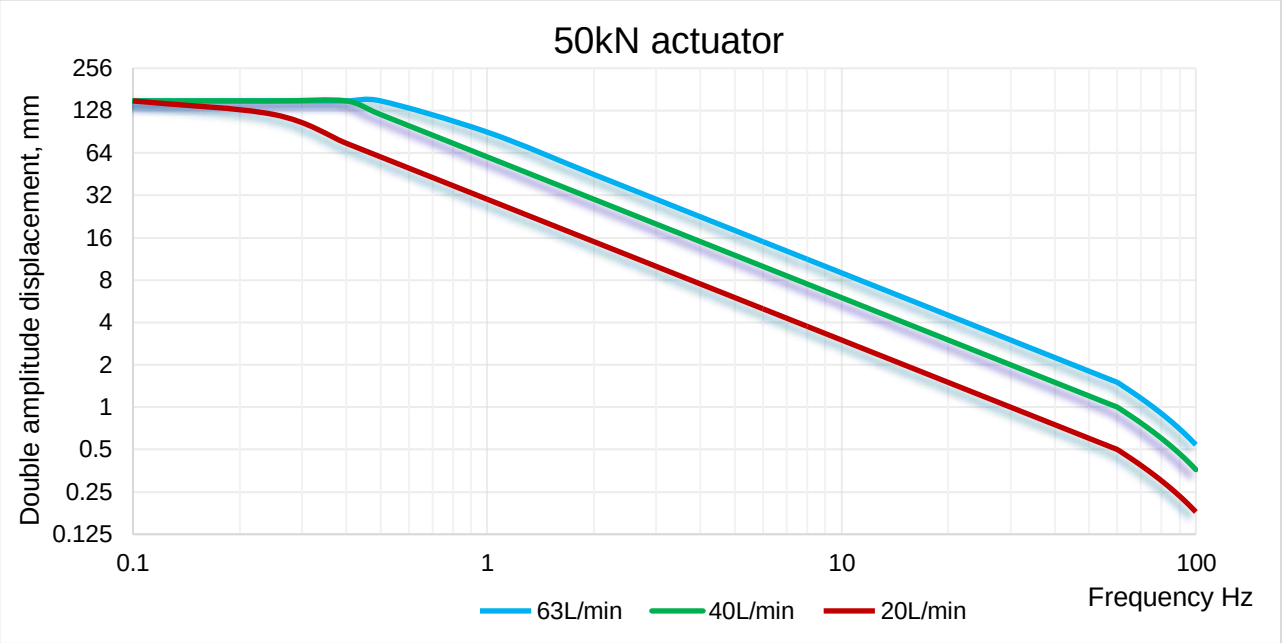
Amplitude frequency performance curves

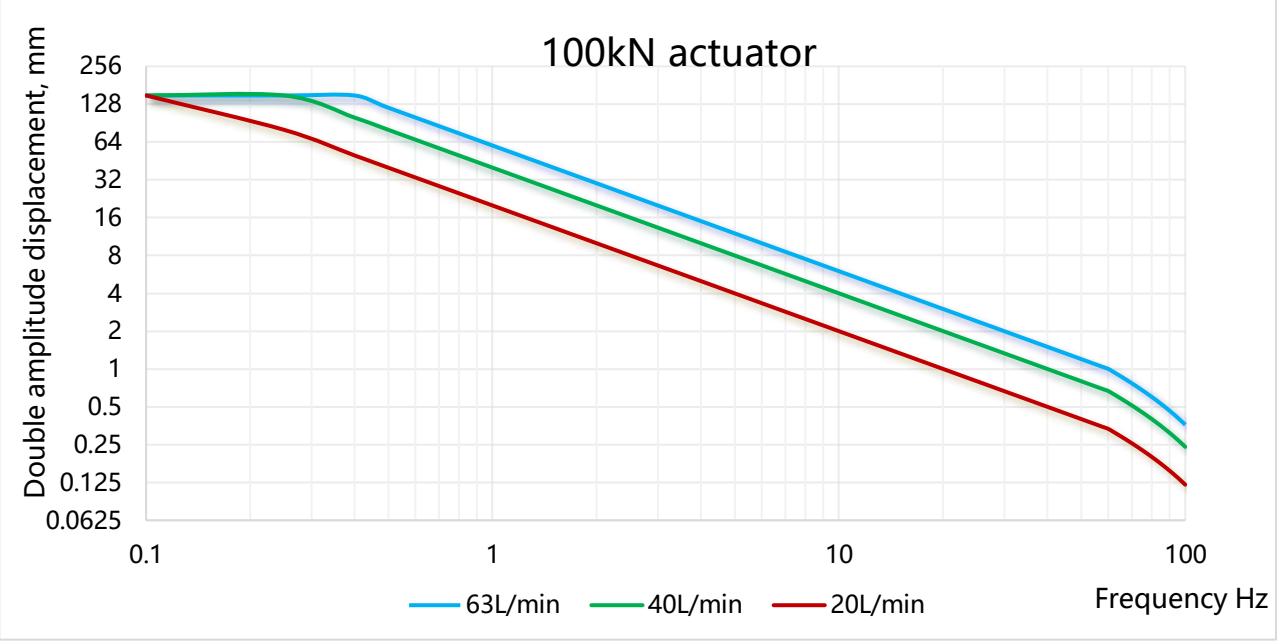


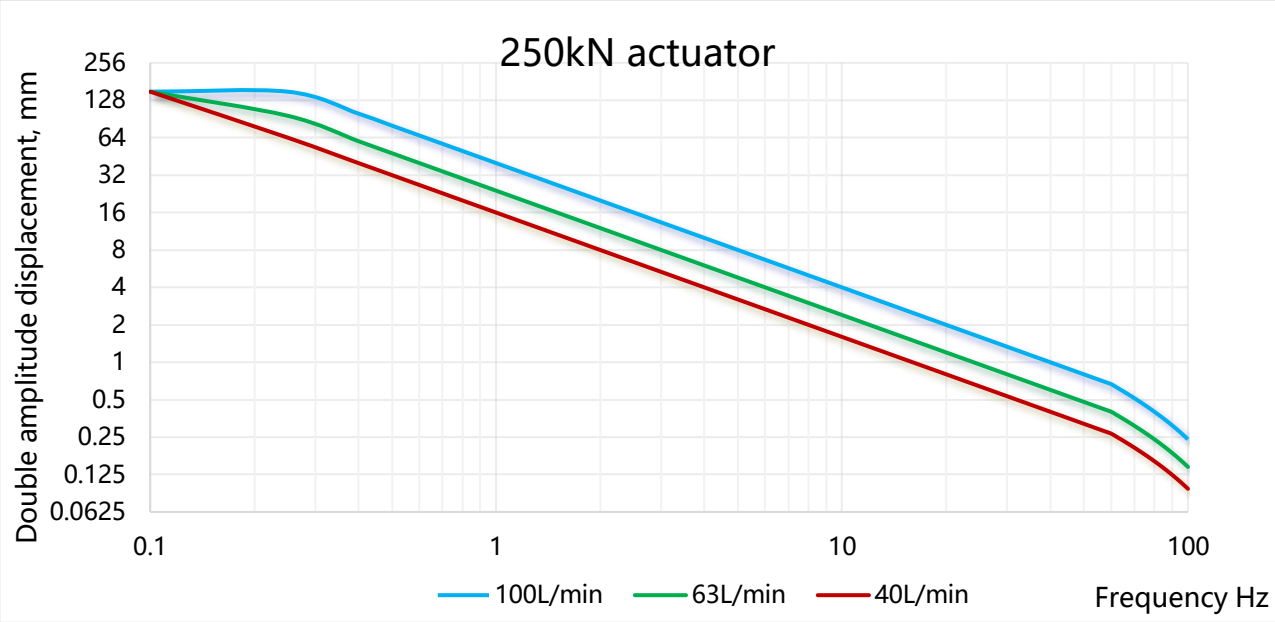
Double amplitude displacement diagram

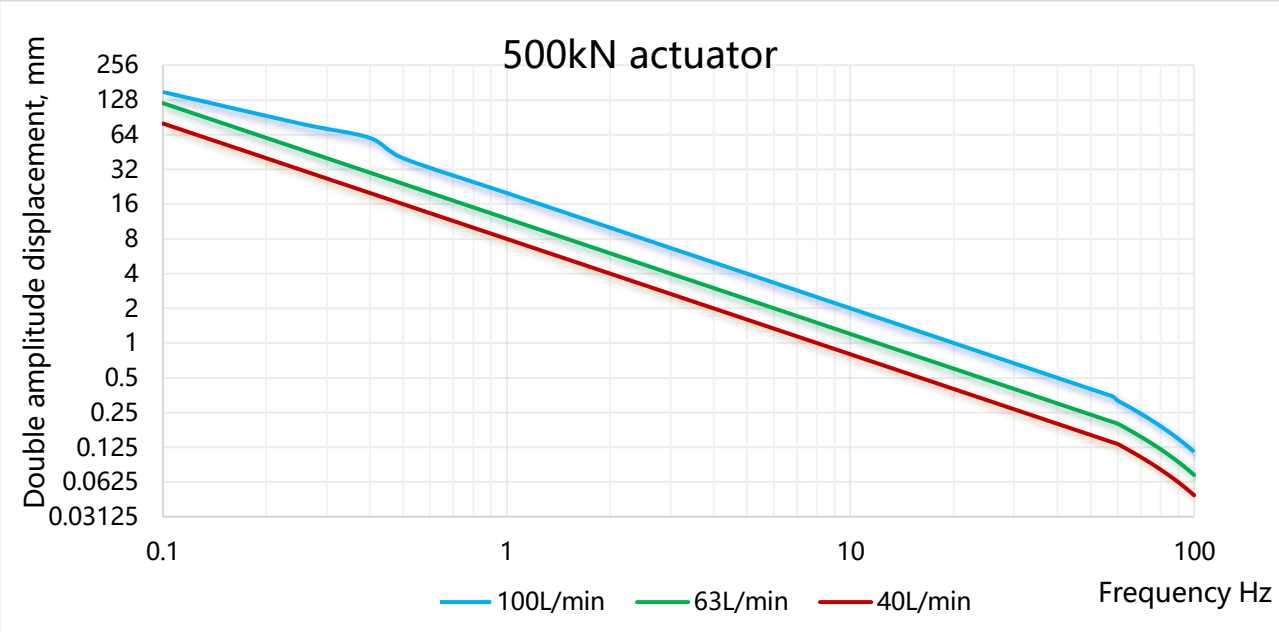
Double amplitude displacement: refers to the total displacement of the actuator during the test, i.e. the absolute value of the upper peak value reducing the lower peak value




50kN actuator
Double amplitude displacement, mm
256
128
64
32
16
8
4
2
1
0.5
0.25
0.125
0.1
1
10
100
Frequency Hz
63L/min
40L/min
20L/min


100kN actuator
Double amplitude displacement, mm
256
128
64
32
16
8
4
2
1
0.5
0.25
0.125
0.0625
0.1
1
10
100
Frequency Hz
63L/min
40L/min
20L/min


250kN actuator
Double amplitude displacement, mm
256
128
64
32
16
8
4
2
1
0.5
0.25
0.125
0.0625
0.1
1
10
100
100L/min
63L/min
40L/min
Frequency Hz


500kN actuator
Double amplitude displacement, mm
256
128
64
32
16
8
4
2
1
0.5
0.25
0.125
0.0625
0.03125
0.1
1
10
100
100L/min
63L/min
40L/min
Frequency Hz

Standard accessories

Name	Description				
Model	HDT254A	HDT504A	HDT105A	HDT255A	HDT505A
Capacity	25kN	50kN	100kN	250kN	500kN
Frame type	2-column, actuator upper-seated				
Actuator	WANCE brand, dual-action structure Rated working pressure: 21MPa Piston travel: 150mm Sealing type: clearance sealing				
Servo valve	American MOOG brand, G761 model, rated pressure: 31.5MPa				
	1 set	1 set	1 set	1 set or two sets Depending on HPU flow rate	
	10L/min	19L/min	38L/min	63L/min	63L/min
Displacement transducer	Brand: MTS Model: R Series Measurement range:150mm Resolution:1μm				
Spoke-type load cell	±25kN	±50kN	±100kN	±250kN	±500kN
	Brand: Interface Structure: Fatigue level spoke-type load cell Repeatability: ±0.02%FS Sensitive: 2mV/V Overload protection: 300%FS				
Intuitive Centralized Controls	Brand: WANCE Control crosshead lifting and lowering Control hydraulic grips Control emergency stop and the movement of actuator				
Controller	Brand: German DOLI Model: EDC i50				
Software	TestCenterV1.0, English version				
Oil hose	Length: 4m **The length is from HPU to machine. Default 4 meters, not longer than 8 meters, please specify when order**				
Tools	Allen wrench: 1.5-10mm, 1 set Allen wrench: 14mm, 1 set Allen wrench: 17mm, 1 set Allen wrench: 19mm, 1 set Phillips screwdriver and flat-head screwdriver: one for each Adjustable wrench: 10 inch, 1 set Needle nose pliers: 1 set Round head hook wrench: 45-50 2 pcs				
	Hook wrench: 45-50 2 pcs	Hook wrench: 68-75 2 pcs		Hook wrench: 80-90 2 pcs	Hook wrench: 110-115 2 pcs
Flushing kit	Replace servo valve G761 when cleaning hydraulic power unit				
Documents	Quality certificate, warranty card and manuals				

Optional accessories

Alignment fixture	Brand: WANCE Adjust the alignment of the grips in eight directions
Computer	Brand: Lenovo, CPU: i7, RAM: 16G, HDD: 1T, display: 23.8”

Optional hydraulic grip

25kN	Vee jaws: Φ5~Φ10mm, Φ10~Φ15mm Flat jaws: 0~8mm, width x height: 30x38mm Outside diameter: Φ126mm Height (without piston): 163mm Unit weight: 9kg
50kN/100kN	Vee jaws: Φ5~Φ10mm, Φ10~Φ15mm, Φ15~Φ20mm Flat jaws: 0~8mm, 8~15mm, width x height: 50x65mm Outside diameter: Φ210mm Height (without piston): 175mm Unit weight: 39kg
250kN	Vee jaws: Φ10~Φ20mm, Φ20~Φ30mm Flat jaws: 0~10mm, width x height: 50x90mm Outside diameter: Φ270mm Height (without piston): 232mm Unit weight: 85kg
500kN	Vee jaws: Φ10~Φ20mm, Φ20~Φ30mm, Φ30~Φ40mm Flat jaws: 0~10mm, width x height: 80×90mm Outside diameter: Φ340mm Height (without piston): 287mm Unit weight: 160kg

Hydraulic power unit

- Noise reduction design: motor and pump are completely immersed in hydraulic oil, so the noise was absorbed by oil. Special shock absorbing rubber is attached when the motor is mounted, to prevent vibration from transmitting to each other and reduce noise; fully enclosed structure once again reduces noise;
- Energy saving design: the variable displacement piston pump can automatically adjust the flow output according to the actual demand of the servo actuator, energy-saving and noise reduction;
- Touch screen control;
- Able to be controlled by software;
- Easy to open and maintain;

- Good cooling effect, can run for a long time and ensure that the oil temperature is controlled within 55℃;
- Wind cooling to grantee long time tests with temperature below 55℃;
- Safety protection: over-temperature, insufficient hydraulic oil, overpower, and test over, the motor will automatically turn off and alarm.

HPU202

HPU101

HPU201, HPU401, HPU631, HPU102

HPU302

HPU402, HPU502, HPU602

Parameters

Model	HPU101	HPU201	HPU401	HPU631	HPU102	HPU202	HPU302	HPU402	HPU502	HPU602
Rated flow rate(L/min)	10	20	40	63	100	200	300	400	500	600
Rated pressure (MPa)	16	21	21	21	21	21	21	21	21	21
Rated power(kW)	4	11	18.5	30	45	90	135kW	180kW	225kW	270kW
Tank volume(L)	25	200	200	400	400	600	1200	2200	2200	2200
Filter fineness(μm)	3	3	3	3	3	3	3	3	3	3
Noise(dB)	50	58	62	65	67	73	74	75	76	77
Net weight (kg)	140	340	350	480	500	1100	2200	3100	3400	3700
Length (mm)	580	1370	1370	1670	1670	1900	2900	4370	4370	4370
Width (mm)	580	780	780	780	780	1080	1080	1080	1080	1080
Height (mm)	930	1155	1155	1305	1305	1305	2180	2180	2180	2180
Remark	1 pump					2 pumps	3 pumps	4 pumps	5 pumps	6 pumps

Accessories of HPU

Model		HPU101	HPU201	HPU401	HPU631	HPU102	HPU202
Oil tank volume		25L	200L	200L	400L	400L	600L
Oil-immersed motor	Brand	Dongling	Italy	Italy	Italy	Italy	USA
	Quantity	1	1	1	1	1	2
	Power	4.5kW	11kW	18.5kW	30kW	45kW	45kW
Pump	Brand	MARZOCCHI	REXROTH	REXROTH	REXROTH	REXROTH	REXROTH
	Quantity	1	1	1	1	1	2
	Flow rate	10L/min	20L/min	40L/min	63L/min	100L/min	100L/min
Valve manifold	Brand	WANCE	WANCE	WANCE	WANCE	WANCE	WANCE
	Quantity	1	1	1	1	1	1
High pressure filter	Brand	LEEMIN	LEEMIN	LEEMIN	LEEMIN	LEEMIN	LEEMIN
	Quantity	1	1	1	1	1	1
Cooler	Brand	Hucheng	Baode	Baode	Baode	Baode	Baode
	Quantity	1	1	1	1	1	1
	Type	Air cooling	Plate cooler	Plate cooler	Plate cooler	Plate cooler	Plate cooler
High pressure filter element for spare use	Brand	LEEMIN	LEEMIN	LEEMIN	LEEMIN	LEEMIN	LEEMIN
	Quantity	2	2	2	2	2	2
Return-oil filter element for spare use	Brand	/	LEEMIN	LEEMIN	LEEMIN	LEEMIN	LEEMIN
	Quantity	/	2	2	2	2	2
Open-type cooling tower (optional)	Brand	/	Guanglin	Guanglin	Guanglin	Guanglin	Guanglin
	Model	/	GL-10	GL-10	GL-15	GL-20	GL-25
	Power	/	0.5kW	0.5kW	0.75kW	1kW	1.2kW
	Dimension	/	Φ980×1980mm	Φ980×1980mm	Φ1260×2100mm	Φ1260×2100mm	Φ1500×2200mm
Close-type cooling	Brand	/	/	/	Baichuan	Baichuan	Baichuan

tower (optional)	Model	/	/	/	BCHL-10	BCHL-10	BCHL-15
	Power	/	/	/	3.5kW	3.5kW	5.5kW
	Dimension L×W×H, mm	/	/	/	1350×750×239	1350×750×239	1950x700×2390
Chiller (optional)	Brand	/	HAILINGKE	HAILINGKE	HAILINGKE	HAILINGKE	HAILINGKE
	Model	/	HL-3A	HL-5A	HL-8AD	HL-12AD	HL-20AD
	Power	/	2.85kW	4.86kW	7.65kW	11.4kW	18.8kW
	Dimension L×W×H, mm		940×555×1060	1045×555×1160	1330×725×1330	1550×750×1460	1760×860×1560
HPU cable	Length	7m	7m	7m	7m	7m	Customer prepare
Cooling tower/chiller cable	Length		10m	10m	10m	10m	Customer prepare
Water pipe	Length		10m	10m	10m	10m	10m
46# hydraulic oil	Prepared by customer	25L	200L	200L	400L	400L	600L
Sub-HPU		/	When one HPU will supply to more than 1 station, this HSM should be equipped.				

	Model	HPU302	HPU402	HPU502	HPU602
	Oil tank volume	1200L	2200L	2200L	2200L
Oil-immersed motor	Brand	USA	USA	USA	USA
	Quantity	3	4	5	6
	Power	45kW	45kW	45kW	45kW
Pump	Brand	REXROTH	REXROTH	REXROTH	REXROTH
	Quantity	3	4	5	6
	Flow rate	100L/min	100L/min	100L/min	100L/min

Valve manifold	Brand	WANCE	WANCE	WANCE	WANCE
	Quantity	1	1	1	1
High pressure filter	Brand	LEEMIN	LEEMIN	LEEMIN	LEEMIN
	Quantity	1	1	1	1
Cooler	Brand	Baode	Baode	Baode	Baode
	Quantity	1	1	1	1
	Type	Plate cooler	Plate cooler	Plate cooler	Plate cooler
High pressure filter element for spare use	Brand	LEEMIN	LEEMIN	LEEMIN	LEEMIN
	Quantity	2	2	2	2
Return-oil filter element for spare use	Brand	LEEMIN	LEEMIN	LEEMIN	LEEMIN
	Quantity	2	2	2	2
Open-type cooling tower (optional)	Brand	Guanglin	Guanglin	Guanglin	Guanglin
	Model	GL-30	GL-50	GL-50	GL-50
	Power	1.5kW	3kW	3kW	3kW
	Dimension	Φ1500×2200mm	Φ1800mm×2400mm	Φ1800mm×2400mm	Φ1800mm×2400mm
Close-type cooling tower (optional)	Brand	Baichuan	Baichuan	Baichuan	Baichuan
	Model	BCHL-30	BCHL-50	BCHL-50	BCHL-50
	Power	11kW	18kW	18kW	18kW
	Dimension	2350x970×2390	2850x1500×2390	2850x1500×2390	2850x1500×2390
HPU cable		Customer prepare	Customer prepare	Customer prepare	Customer prepare
Cooling tower/chiller cable	Length	10m	10m	10m	10m
Water pipe	Length	10m	10m	10m	10m
46# hydraulic oil	Prepared by customer	1200L	2200L	2200L	2200L

Controller

Model: EDC i50

Brand: Germany DOLI

Function:

- It has PIDF control, which can realize closed-loop control of force, displacement, deformation and other parameters, and the three control modes can be smoothly switched without disturbance. Automatic setting of initial PID parameters: dynamic response adaptive control system. The PID parameters can be automatically updated continuously, and the change of sample stiffness can be automatically compensated to ensure that the system runs in the best control state.
- Various test waveforms can be created: sine wave, triangular wave, square wave, oblique wave, sawtooth wave, random wave and various combination waves.
- Various test data can be collected: peak value, valley value, time, maximum value, minimum value, average value, and cycle data, fatigue data, etc. Data sampling and feedback frequency is not less than 10 kHz. The fully digital controller uses a VortexDX86 800 MHz processor for the control and data acquisition systems respectively. The control speed is 10 kHz, where 10 kHz is the control closed loop (position, load, strain) and 10 kHz is the stiffness control closed loop.
- With multiple parameter control: proportional, integral, differential (PID), delay (Lag), Feed forward (Feed) serial and parallel control.
- The signal resolution is up to ± 250,000 steps, and manual conversion is eliminated in the range of full scale use.
- It can be used independently: the test data is directly displayed on the EDC, the control instruction is input by the compound function key, and the basic data analysis and processing program installed in the EDC can output the tabular control and measurement data after connecting the printer, and there are a variety of embedded application software for users to choose.

Technical parameters

- Main processor: VortexDX86 800 MHz;
- Control frequency: 10kHz;
- PC communication interface: USB 2.0 Full speed or Ethernet 10/100Mbit;
- Encoder input channel: square wave max 32MHz, app.300kHz;
- SSI signal input: 300kHz;
- Digital input/output: 24V; Eight pcs;
- Serial sensor interface: COM1(built-in);

- Synchronous data acquisition and motion control: satisfactory;
- iSI bus expansion slot: 3;
- Load and strain resolution: ± 250,000 steps;
- Digital position, load and strain control, smooth transition between control modes without impact;
- The synchronous sampling and display data is 10kHz, enabling dynamic testing of trapezoidal, triangular and sinusoidal waves;
- Power amplifier with servo valve inside: 300mA.

Test software

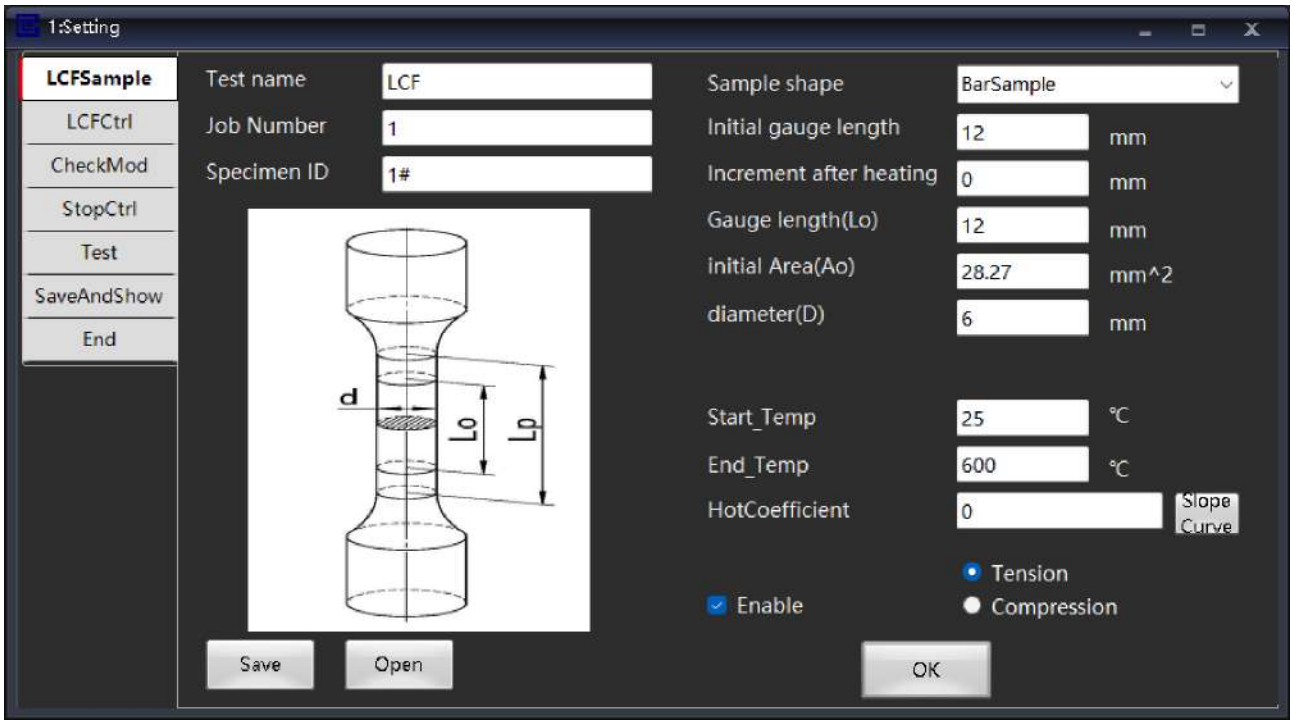
- TestCenterV1.0 is a multi-functional test software independently developed by WANCE. The software integrates various test standards and customer needs of various industries, and the test control and results are professionally reviewed by industry experts; the results are consistent with those of several internationally renowned fatigue testing machines.
- According to the test standard, built-in independent high-low cycle test plan, crack test plan, elastomer test plan, easy to operate.
- For environmental simulation working condition test, users can customize the test waveform, customize the test process, and coordinate the fatigue test with external equipment (such as high temperature furnace).
- For non-standard equipment, test plans and test reports can be customized according to user needs. Such as seismic support, shock absorber, multi-channel coordinated loading test.
- Software supports custom report templates, allowing multiple groups of test results to be exported and calculated (such as R resistance and fatigue life statistics reports).
- Multi-function curve function (stress/strain hysteresis curve, peak and valley value curve, cumulative curve) to meet customer needs.
- Support for experimenter permission Settings.
- Supports multi-channel coordination control.
- Support PLC communication, remote control of oil source, cooling device, etc.
- A variety of test control, can achieve dynamic, static, sweep frequency, superposition, displacement control force target and other operations.
- Multi-stage control of user-defined running parameters.
- Set the test conditions, and set the logical relationship of the test process in advance, such as the test end conditions, oil source stop conditions, etc.
- Single-window multi-curve interface, multi-window curve interface, convenient to observe the test status in the test.
- Curve coordinates can be freely defined, and real-time curves, peak-valley value curves, and crack growth rate curves of various data can be realized.
- Software supports data analysis such as fitting calculations/curves.

- Logs record every operation and error, helping you query error causes.
- Lifetime upgrade service.

The following software functions need supporting test accessories, such as extension meter, COD gauge, fixture, high temperature furnace, environmental box, etc.

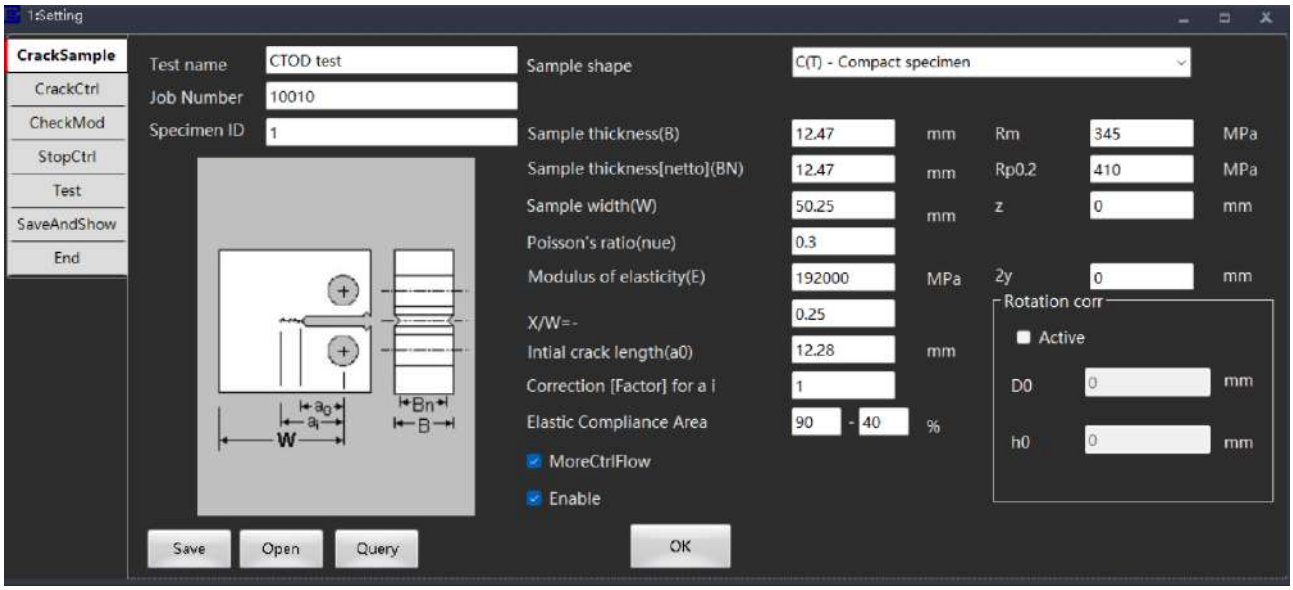
1) High-low cycle test module

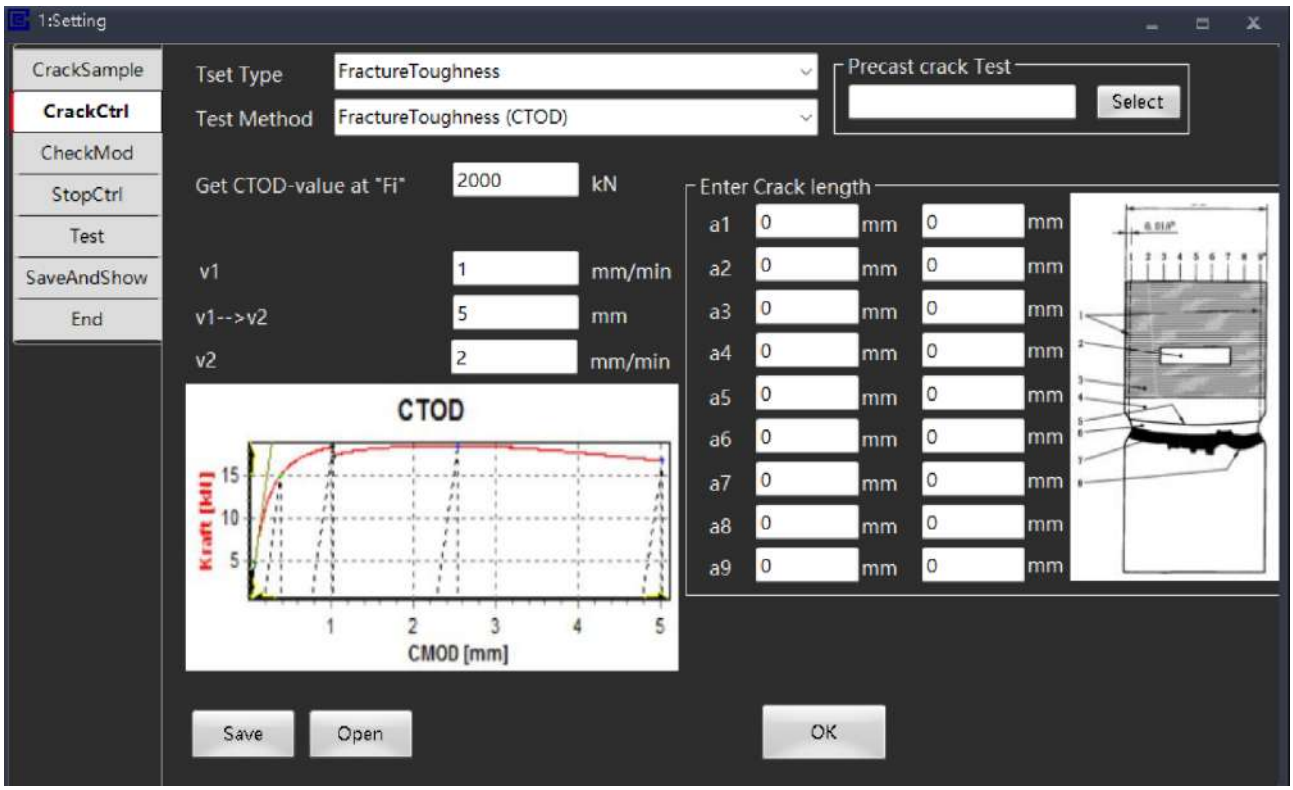
Meet the relevant standards of high-low cycle test (ISO 1099, ISO 12106, GBT 3075, GBT 5248, GBT 26077, ASTM E466, ASTM E606, etc.);

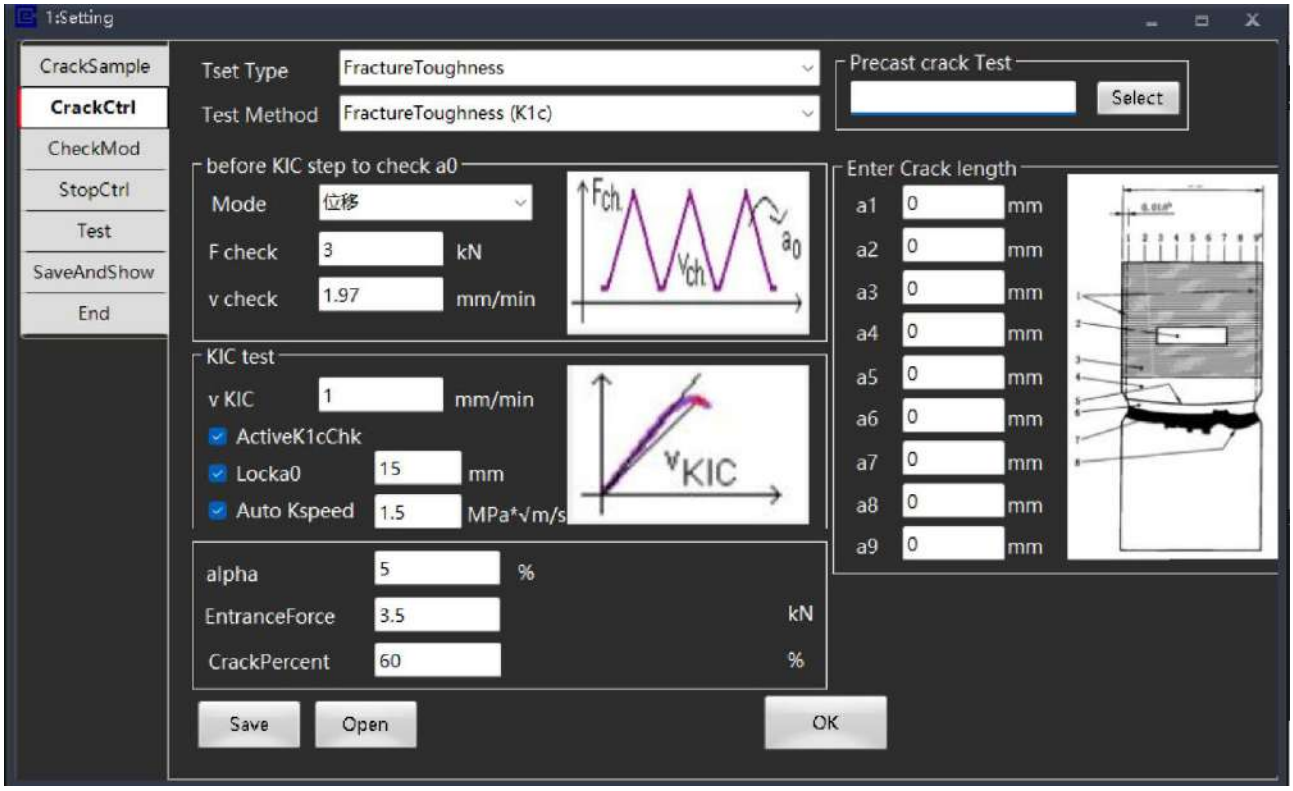


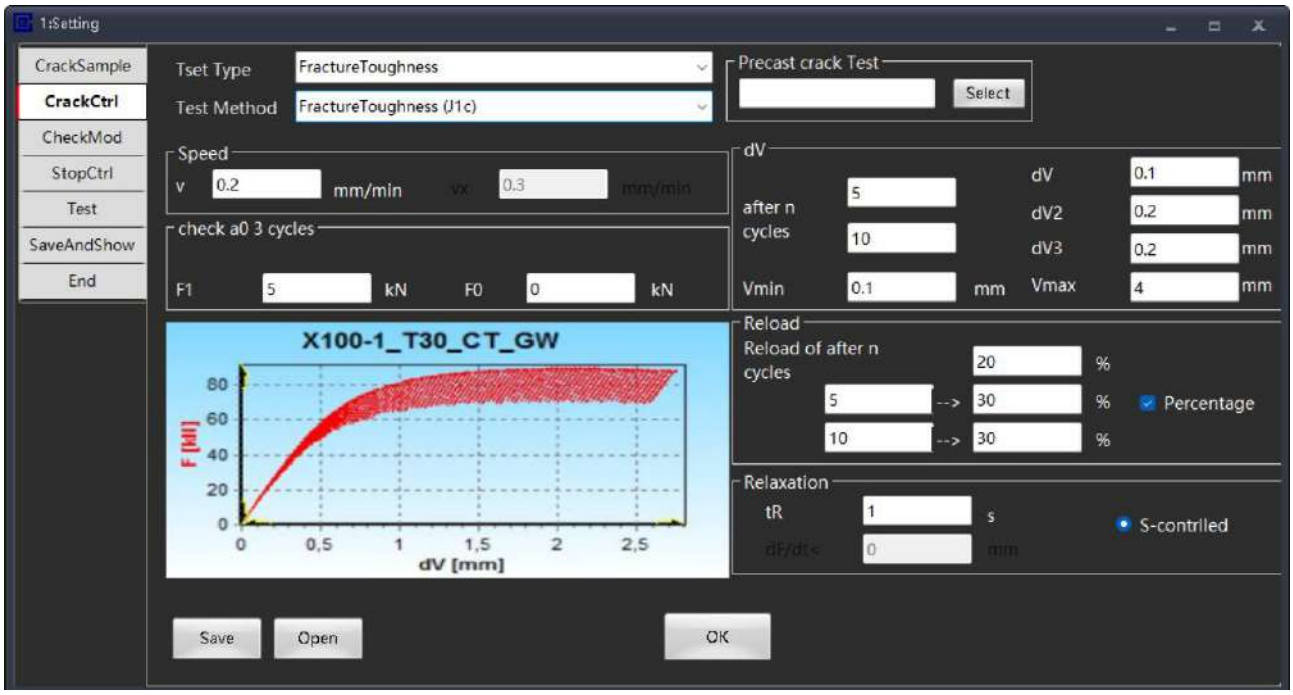
2) Fracture test module

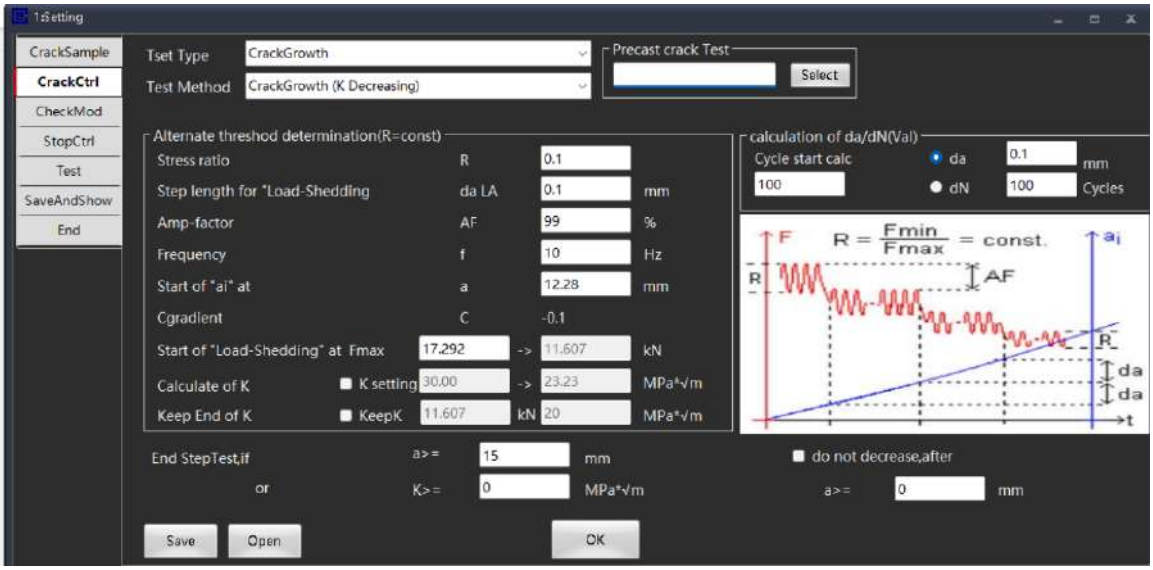
- Meet KIC test, CTOD test, JIC test, da/dN crack growth rate test related standards (ASTM E399, ASTM 1820, ISO12135, GB/T21143, etc.);
- Suitable for CT, SEB, MT and other sample shapes;
- Data result statistics module can generate R resistance curve;
- CTOD and JICC tests support multi-sample and single-sample methods.
- Crack growth test supports K-increasing, K-decreasing, and constant K.






1:Setting
CrackSample
CrackCtrl
CheckMod
StopCtrl
Test
SaveAndShow
End
Tset Type
FractureToughness
Test Method
FractureToughness (K1c)
Precast crack Test
Select
before KIC step to check a0
Mode
位移
F check
3
kN
v check
1.97
mm/min
Fch
Vch
a0
KIC test
v KIC
1
mm/min
ActiveK1cChk
Locka0
15
mm
Auto Kspeed
1.5
MPa*√m/s
vKIC
Enter Crack length
a1 0 mm
a2 0 mm
a3 0 mm
a4 0 mm
a5 0 mm
a6 0 mm
a7 0 mm
a8 0 mm
a9 0 mm
alpha
5
%
EntranceForce
3.5
kN
CrackPercent
60
%
Save
Open
OK


1:Setting
CrackSample
CrackCtrl
CheckMod
StopCtrl
Test
SaveAndShow
End
Tset Type
FractureToughness
Test Method
FractureToughness (J1c)
Precast crack Test
Select
Speed
v
0.2
mm/min
vx
0.3
mm/min
check a0 3 cycles
F1
5
kN
F0
0
kN
X100-1_T30_CT_GW
F [MI]
dV [mm]
dV
after n cycles
5
10
Vmin
0.1
mm
dV
0.1
mm
dV2
0.2
mm
dV3
0.2
mm
Vmax
4
mm
Reload
Reload of after n cycles
20
%
5 --> 30 %
10 --> 30 %
Percentage
Relaxation
tR
1
s
S-contrlled
dF/dt<
0
mm
Save
Open
OK

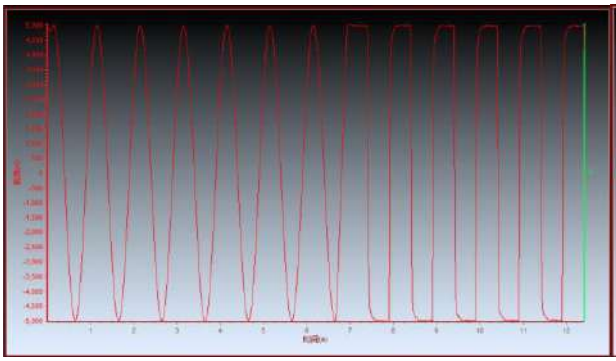


3) Elastomer test module

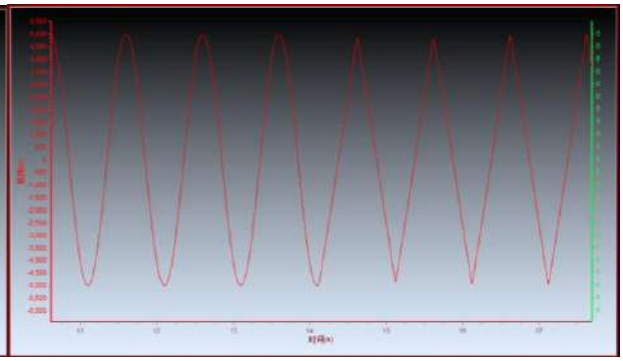
- Independent test program to improve customer operability;
- meet elastomer damping test standards;
- Variable amplitude, frequency conversion and other test actions can occur in the test;
- Full report on built-in elastomer.

4) Waveform combination action test

- Can be freely combined, there is no quantity limit;
- Free start test protection conditions to protect different waveforms;
- Can save the combination waveform setting scheme, easy to recall.



Sine wave + square wave



Sine wave + triangle wave

5) Custom waveform

Can input irregular waveform to realize simulation test, spectrum and other tests.