

Hydraulic Universal Testing Machines

# UH-X/FX Series





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Hydraulic Universal Testing Machines

Environmentally and operator friendly  
state-of-the-art universal testing machine

Significantly Improved Control  
Performance and Ease-of-Operation

Semi-auto-tuning function enables high-precision stress control and strain control  
(compliant with ISO 6892-2009 and JIS Z2241 metallic materials tensile testing standards) >> Page 4

Extra large color LCD touch panel screen significantly improves ease-of-operation and visibility >> Page 4

Environmentally Friendly Design Saves Energy and Hydraulic Oil

Product line includes UH-Xhi/UH-Fxhi series, which features a hybrid hydraulic unit that reduces energy consumption by 82 % (with model UH-500kNXhi) **Hybrid** >> Page 5

Ensures Reliability and Safety

Ultra-high-speed sampling function ensures no sudden variations in strength are missed >> Page 6

A variety of automatic control programs included as standard >> Page 6







## Significantly Improved Control Performance and Ease-of-Operation

### Semi-Auto-Tuning Function Enables High Precision Stress Control and Strain Control

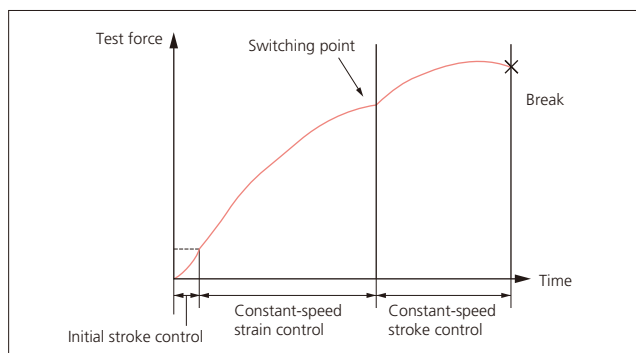
(compliant with ISO 6892-2009 and JIS Z2241 metallic materials tensile testing standards)

UH-X

UH-FX

Control parameters are auto-tuned in real time, based on test force and strain values measured during testing. This eliminates the need for preliminary testing and makes it easy to perform highly precise stress-controlled or strain-controlled testing. The semi-auto-tuning function also allows performing ISO 6892-2009 (precision strain-controlled testing) and JIS Z2241 compliant metallic materials tensile testing.

\* Requires TRAPEZIUMX.



### Extra-Large Color LCD Touch-Screen Significantly Improves Ease-of-Operation and Visibility

UH-X

UH-FX

The large 10.4-inch color touch-screen significantly improves visibility and ease-of-operation. This color graphical user interface enables performing a wide variety of functions with a simple touch of the screen. This makes it easy to operate the testing machine, even for first-time users. It also displays S-S curves in real time during testing.



## Rangeless Data Measurement

UH-X

UH-FX

Test force and strain can be measured without having to specify an amplifier range. This means data can be acquired using optimal measurement parameters, even for specimens with unknown strength. In addition, since the analog indicator and output to the data recorder have a virtual range, evaluation is possible in the same manner as before.

## Key Switch Included Standard

UH-X

UH-FX

A key switch is provided standard to ensure security is properly controlled.



## USB Memory Enables Performing Tests Without Connecting to a Computer\*

UH-X

UH-FX

By inserting a USB memory stick into the measurement controller with test parameters stored in the USB memory, tests can be performed without a computer. Furthermore, measurement data is automatically saved in the USB memory after tests, which enables analyzing the data with TRAPEZIUMX or using it to create reports.

\* Requires TRAPEZIUMX.



## Crosshead Elevating Switch Box (optional) Provides Finger-Tip Control

UH-X

UH-FX

Using the crosshead elevating switch box allows positioning the crosshead without looking away from the testing space.

# Environmentally Friendly Design Saves Energy and Hydraulic Oil

## Hybrid Hydraulic Unit Reduces Power Consumption by 82 % (with model UH-500kNXhi)

A hybrid hydraulic unit combines an AC servo motor with a hydraulic pump so that the pump only operates when necessary. This provides an energy-efficient testing machine and reduces its environmental impact.



**Hybrid**

UH-X

UH-FX

This product conforms with Shimadzu's ECO labeled product.

Energy Saving: Power consumption reduced by 82% as compared to a conventional Shimadzu product. (with Shimadzu standard operating conditions)

## Quieter Hydraulic Unit

UH-FX

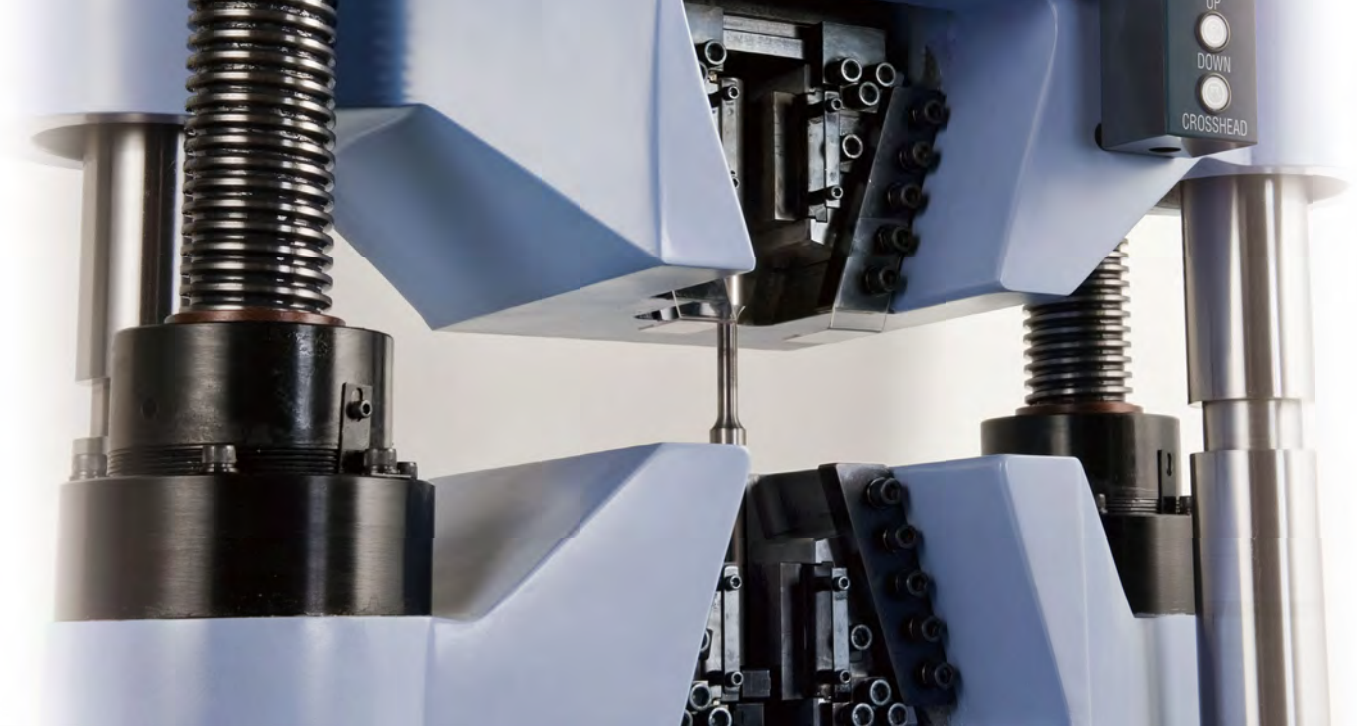
The sound level of the hydraulic unit for the grips was reduced by over 10 dB, from 75 dB to 65 dB, compared to the previous model.

## Requires up to 50 % Less Hydraulic Oil

UH-X

UH-FX

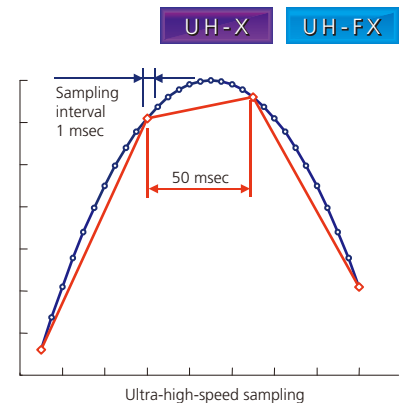
For model UH-F500kNXhi, the amount of hydraulic oil required has been cut in half, from 80 to 40 liters.



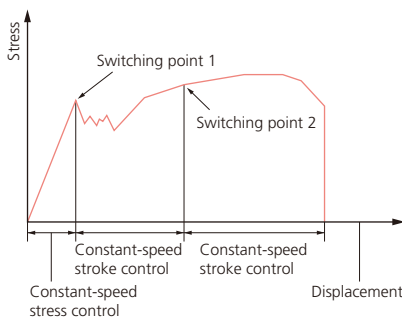
## Ensures Reliability and Safety

### Ultra-High-Speed Sampling Function Ensures No Sudden Variations in Strength Are Missed

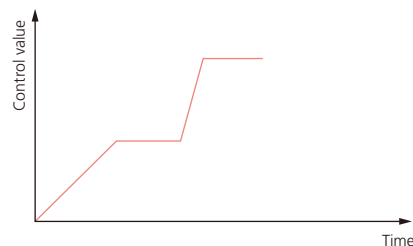
By connecting to a computer installed with TRAPEZIUMX data processing software, data can be acquired at ultra-high sampling rates of up to 1 msec (1 kHz). This enables capturing any sudden changes in test force, such as at the break point of brittle materials, with high precision. Sampling parameters can be changed during tests, so that critical areas can be analyzed in more detail.



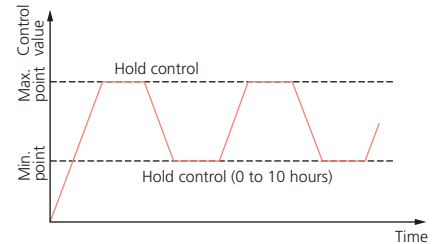
### A Variety of Automatic Control Programs Included Standard



A tensile testing control program for metallic materials (JIS Z2241 and ISO 6892-2009) is included standard.



Standard programs include testing at a constant speed, as well as testing where the controlled parameter is increased at a constant rate, and then held at a certain value. The controlled parameters include stroke, test force, strain, and others.



Not only cycle test control, but also high-temperature tensile test control, stroke speed 3-step switching control, and even concrete test control are included standard.

## Equipped with Easy-to-Operate Front-Opening Hydraulic Grips

UH-FX

- The center hole hydraulic cylinder actuated front-opening hydraulic grips allow efficient specimen recovery and scale removal and provide superior safety. Testing long materials is easy as well.
- The grip face open/close switch is designed for safety. Grips are actuated only while the switch is depressed.



## Easy to Replace Grip Faces

UH-FX



Grip faces are light weight and can be exchanged easily by simply inserting them from the front.

## Easy-to-Understand Specimen Grip Positioning Indicator Included

UH-FX

The grip face positioning markings allow gripping specimens easily and accurately.

## Compression Plates Installed/Removed Easily in a Single Step

UH-FX

No wrenches or other tools are necessary.

## Non-Rotating Threaded Columns Improve Safety

(not included on large-capacity models from 2000 to 4000 kN)

UH-X

UH-FX

This allows mounting specimens with confidence.

## Includes Grip Face Overhang Indicator Cover

UH-FX



An indicator cover is installed at the maximum grip face overhang position, occurring when the grip faces are closed. This allows mounting specimens with confidence.

## Grip Holder Includes Safety Stopper

UH-X

UH-FX

A safety stopper prevents the left and right grip faces from contacting each other in the event of an operating error, which prevents damaging the grip faces.

## Multi-Level Crosshead Positioning Structure

(all models)

UH-X

UH-FX

The upper crosshead position can be changed easily depending on the specimen length. Therefore, tests can be performed at a height appropriate for the operator.

## Safety Cover Can be Included for Protection from Flying Specimen Debris

(optional for all models)

UH-X

UH-FX

A protective safety cover can be included on the loading unit for protection from flying specimen debris. In addition, an interlocked switch can be included on the door, upon request.



# Measurement Controller (Operation Unit)

## Easy-to-See Display for Both Digital and Analog Measurements

The analog indicator is large, with a 450 mm diameter. The digital display is located within the same field of view to ensure even small changes in test force are not overlooked, such as at the yield point.







step  
01

## Main screen

From this initial screen, various settings can be specified or information displayed.



step  
02

## Set test parameters

This screen allows the easy entering of all necessary test parameters via a single screen. Enter the loading speed, specimen information, test mode, and other settings.



step  
03

## Set the break detection mode

Next, specify the method used for detecting the break point. In addition to the break sensitivity and break level functions available previously, a new break peak level function was added to make the system even easier to use.



step  
04

## Start the test

This completes the setup. Now press the start button. To prevent starting accidentally, a two-step interactive start process is used.

# The Touch-Screen Enables Intuitive Operation



## Large Character Display

The large-sized test force/stroke data display can be easily read. The display can be switched to the stress value display mode or displacement value display mode with a touch of a button.

## S-S Curve Display

During a test, an S-S curve is displayed in real time.

## Testing Machine Operating Status/Test Parameters Display

Since the testing machine's operating status and test parameters can be checked at a glance, an erroneous setting or operation can be prevented.

## Test Parameters Menu Screen

The testing machine's functions can be visibly operated with the icon buttons. This can prevent erroneous operation, and improve test efficiency.



## File Operation Screen

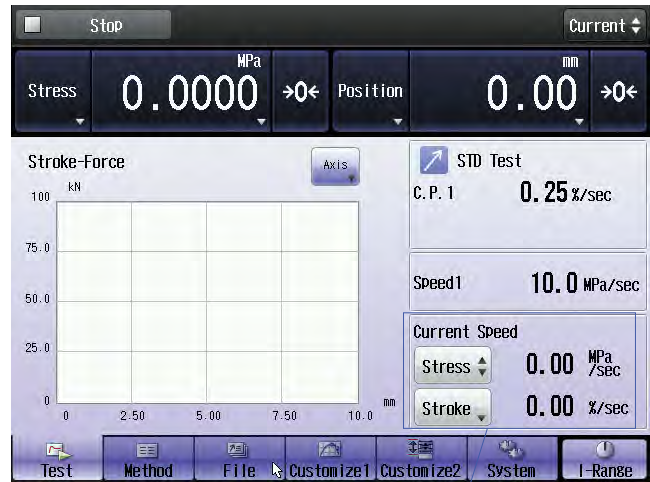
The test parameters changeover operation can be simplified by storing test parameters in a file of each test type.



## Cycle Test Mode



## Speed Meter Function



In contrast to the specified speed setting, the actual current speed is displayed on the screen.

## Cycle Count Function

During a cycle test, the number of repeated loads applied to the specimen is displayed. Also, this function can stop the test, or break the specimen in the preset cycle number.

## Test Force Auto-Calibration Function

The electrical test force calibration can be performed with a touch of a button, without the necessity of troublesome adjuster knob operations.



## Auto/Full-Auto Test Force Range Switching Function

When a recorder is connected, the force range is automatically changed immediately before the force output signal exceeds the full-scale value.

## Break Detecting Function

This function detects a specimen break to automatically stop the testing machine and return it to the origin.



## Auto-Return Function

This function automatically returns the ram of the testing machine to the origin with a touch of a button. When the auto-return function is used together with the break detecting function, the testing machine automatically returns to the origin after detection of a specimen break.

## Bilingual Function

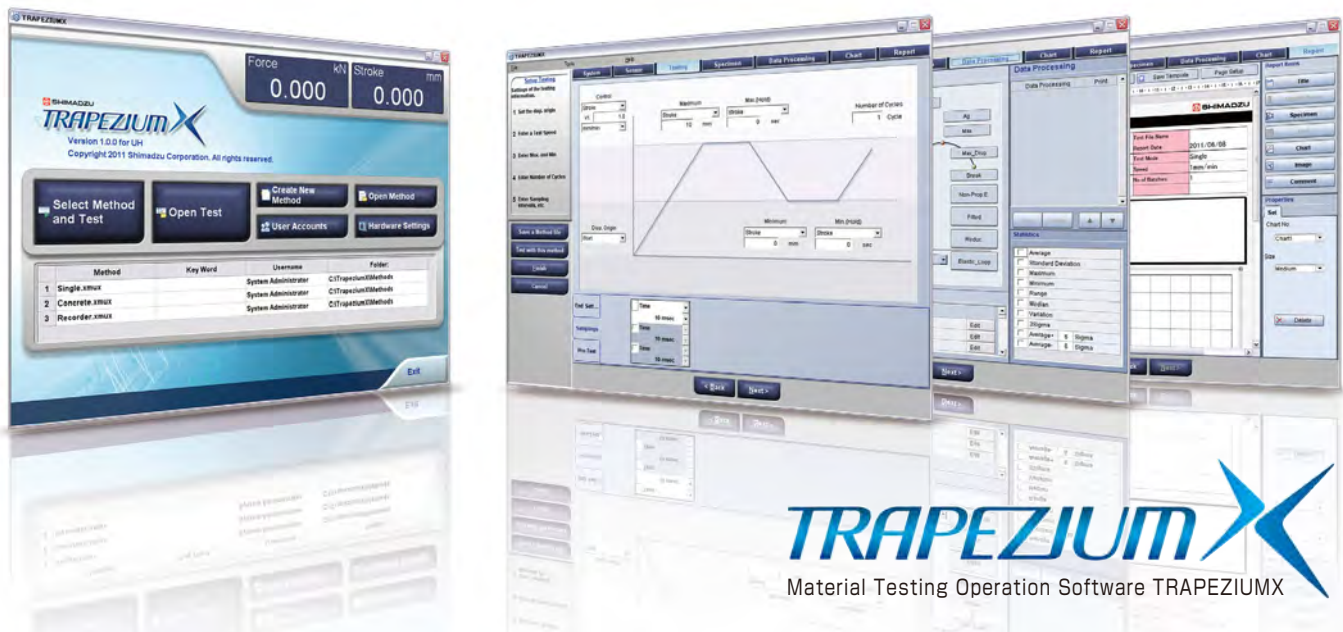
Japanese or English can be selected on the LCD touch-panel screen. The display language can be switched with a touch of a button.

## PEAK/BREAK Value Display Function

The test force, stress, and stroke values at the maximum force point and break point are displayed during a test. When a displacement meter is connected, the displacement value at each point can also be displayed.

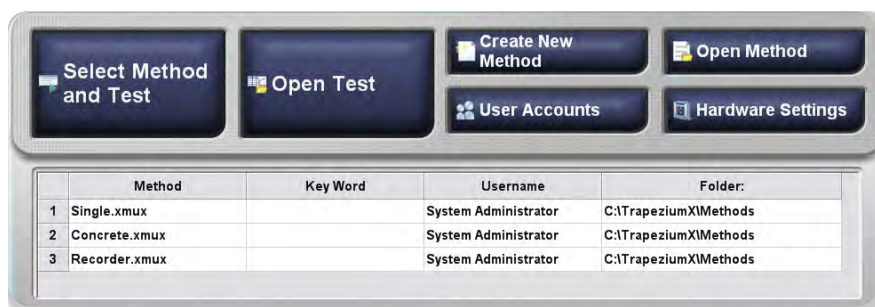


# Supported by a Thoroughly Refined Operation System



## Enables Intuitive Operation

1. Search files and select parameters quickly by simply touching the screen to perform consecutive tests efficiently.



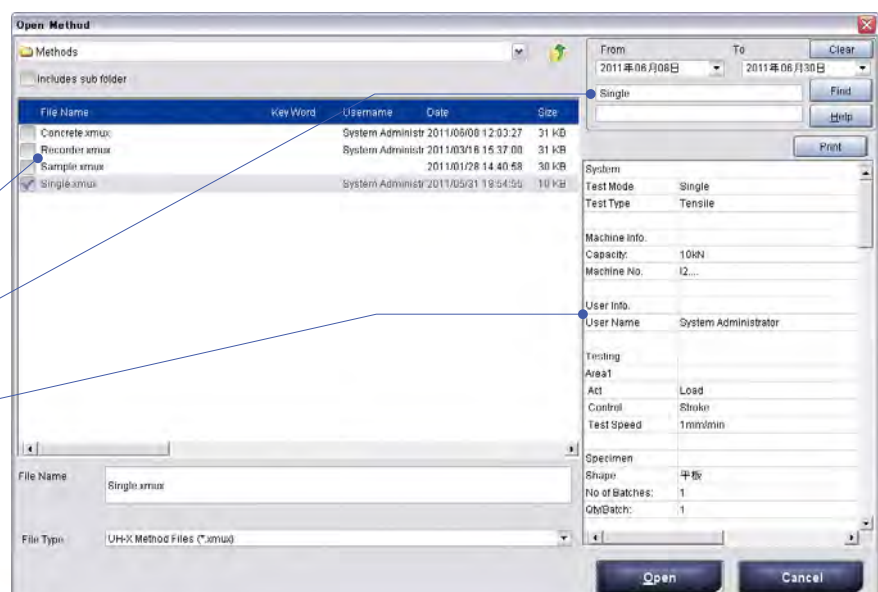
- By registering frequently used parameters in a Quick Parameter List, tests can be started in one step.

- As more test results and parameter files accumulate over time, file can be searched by keywords or date. In addition, reports and setting lists can be previewed to recall files easily.

Files found by searching

Search parameters

Preview





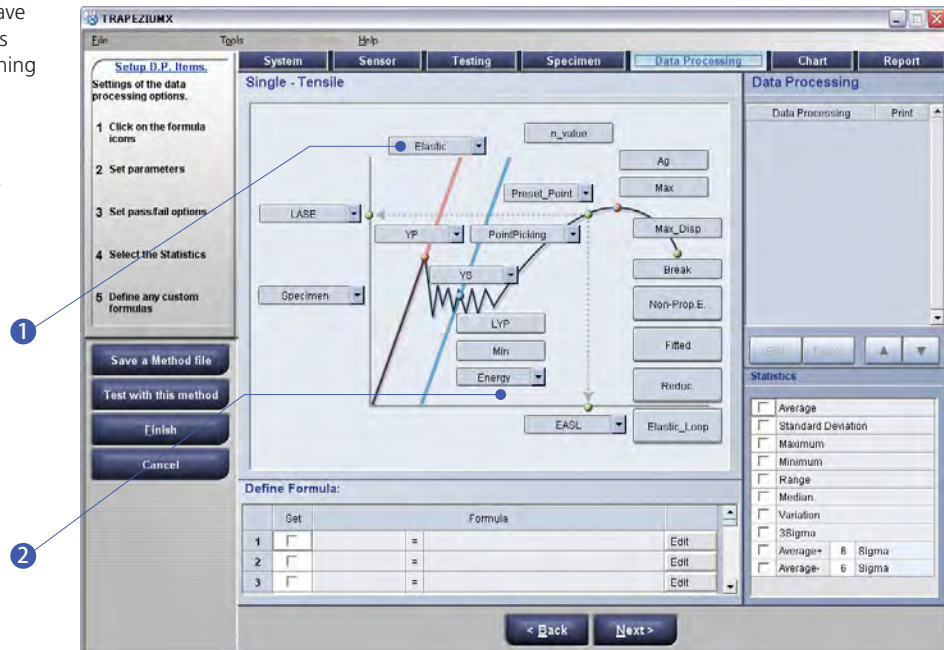
## 2. Visual wizard provides guidance for setting parameters with confidence

- Complicated parameter settings can be specified while viewing the overall process flow using the Test Parameter Wizard.
- Guidance for operating procedures is linked to the software help function and displayed on each screen.
- Easy-to-understand illustrations are used for test control, specimens, and data processing parameter screens. Specifying settings is now much easier.

### Data Processing Settings Screen

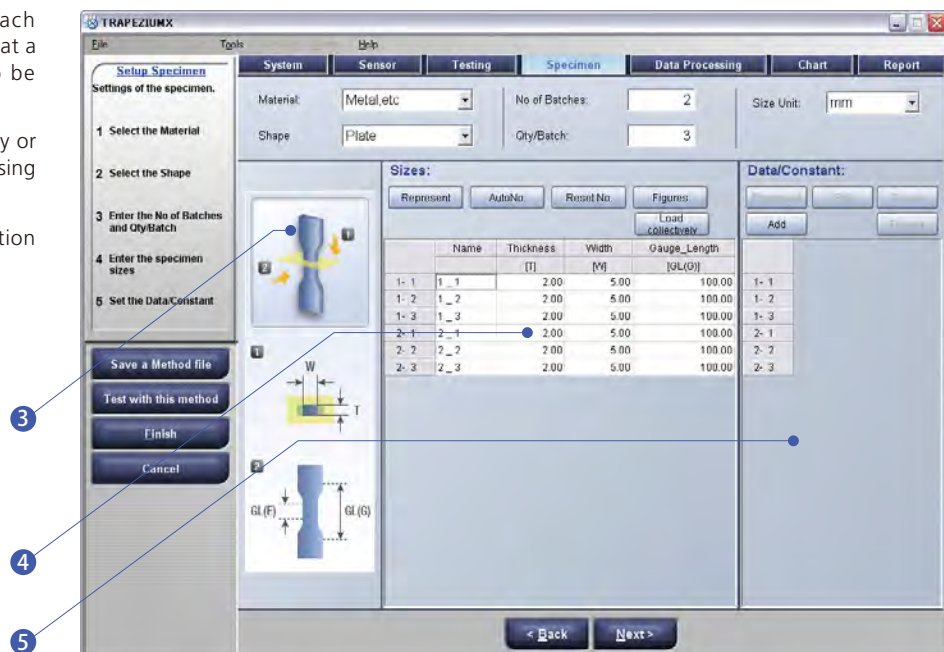
(Metal is selected as the material on the screen, but rubber and plastic are also available.)

- 1 Typical data processing parameters have been prepared in advance. Parameters can be specified easily by simply touching a button on the corresponding illustration.
- 2 The illustration changes automatically depending on the test mode and specimen material selected.



## 3. Screen for setting specimen quantity and dimensions

- 3 An illustration is displayed for each specimen shape. This makes it clear at a glance what dimensions need to be entered.
- 4 Dimensions can be entered manually or automatically from an Excel list or using electronic calipers.
- 5 In addition to dimensions, information can be entered for each specimen.



## Quickly Obtain the Data Needed

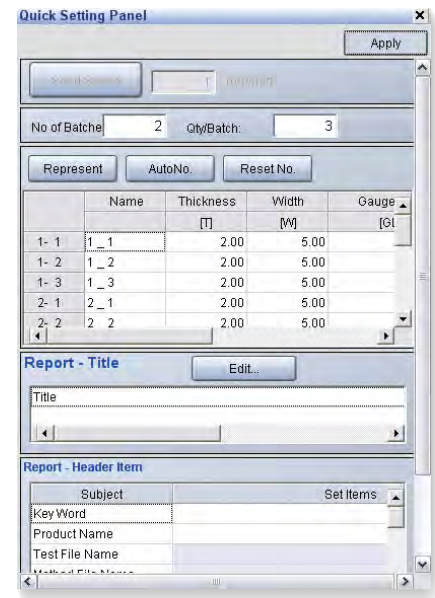
1. The Quick Setting Panel enables quickly entering speed, dimensions, report information, and other settings directly into the Main screen.



## 2. More advanced navigation, with a teaching function

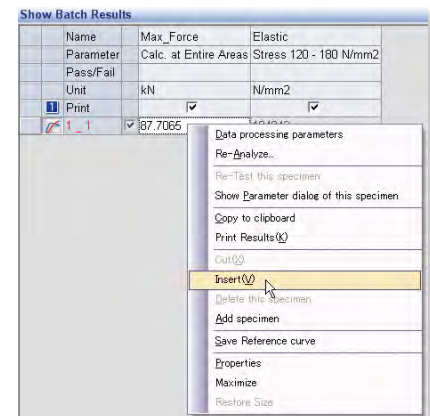
- Only the functions needed for the given testing situation are displayed as Navigation buttons. This means that the system can be efficiently operated with confidence for consecutive testing by simply touching visually large buttons. Furthermore, a teaching function is provided, which learns from user operations in each situation to add new buttons to the navigation bar for frequently used functions.

This means that the more the system is used, the better it fits the user's operating style and the more quickly operations can be accomplished.



## 3. Retest, Add test, and File merge functions

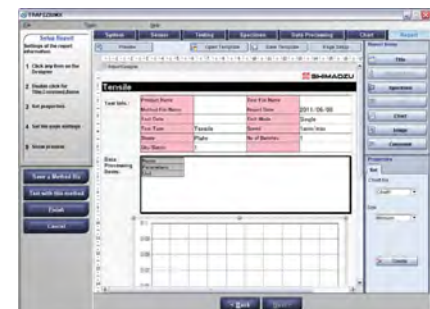
- Retest:  
Portions of batch test results can be retested and replaced with new results.
- Add tests:  
The total number of tests can be increased by adding batch numbers (or lot numbers).
- File merging:  
Test result files can be selected and merged. It also enables statistical processing.



## More Attractive Reports Increase Persuasiveness

Create expressive reports with freely configurable layouts and a wide selection of web-compatible output functions

- Report Designer enables freely changing layouts  
Reports can be created that contain test results, graphs, photographs, logos, or other graphical content. The layout and size of items in reports can be freely changed. Fonts, colors, borders, and other features can be specified in detail for each item.
- Reports can be output in Adobe Acrobat®, Microsoft Word®, Excel®, or HTML file formats  
Reports created using Report Designer can be output in various file formats. This allows freely customizing reports using software preferred by the user.
- WebPlus Function (optional)  
By installing the WebPlus function (optional) on the server, networked computers without TRAPEZIUMX installed can be used to reanalyze data or print reports via Internet Explorer.



# Select from 5 Software Modules Depending on Application

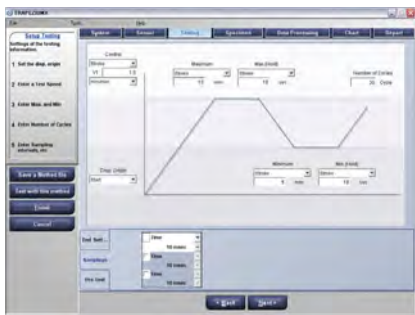


TRAPEZIUMX offers five software modules – single, cycle, control, concrete, and recorder.

These can be purchased in combinations as needed for customer testing requirements. If more than one is purchased, one-touch switching between modules avoids having to launch each program separately.

## Cycle Software

This software enables performing endurance testing and other tests that involve repeated application of test forces.



## Concrete Software

The software is used for testing concrete (compression, bending, and cleavage testing). It enables performing tests compliant with JIS A1108, JIS A1106, and JIS A1113 standards.



## Single Software

This software is used to perform typical single-direction tests. It enables performing tensile, compression, and bending testing.



## Control Software

This software enables freely creating a user-specified testing machine movement routine. It allows configuring complicated combinations of tensile, compression, and holding steps.



## Recorder Software

Tests are controlled using a UH-X measuring controller and this software is used to acquire data, display graphs, and process data. This software is used in cases such as when using the load control knobs on the measuring controller to manually perform tests.



# UH-X and UH-FX Series – Layout/Installation

The following figures show the standard layout of Shimadzu Universal Testing Machines. To change the layout according to the conditions of the installation place or a change in system configuration, examine the layout referring to these figures.

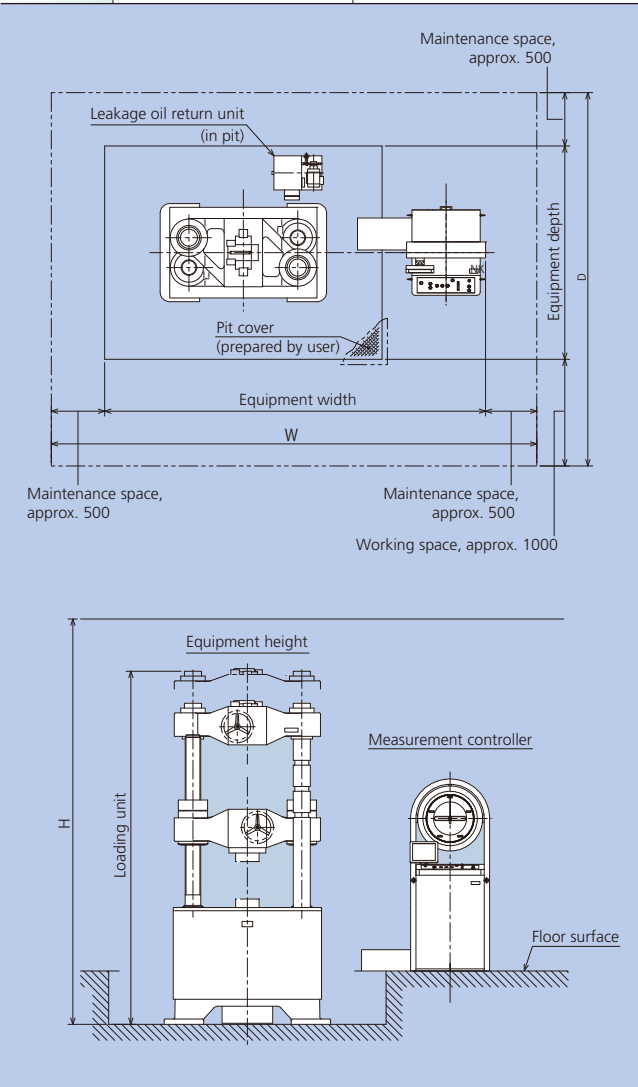
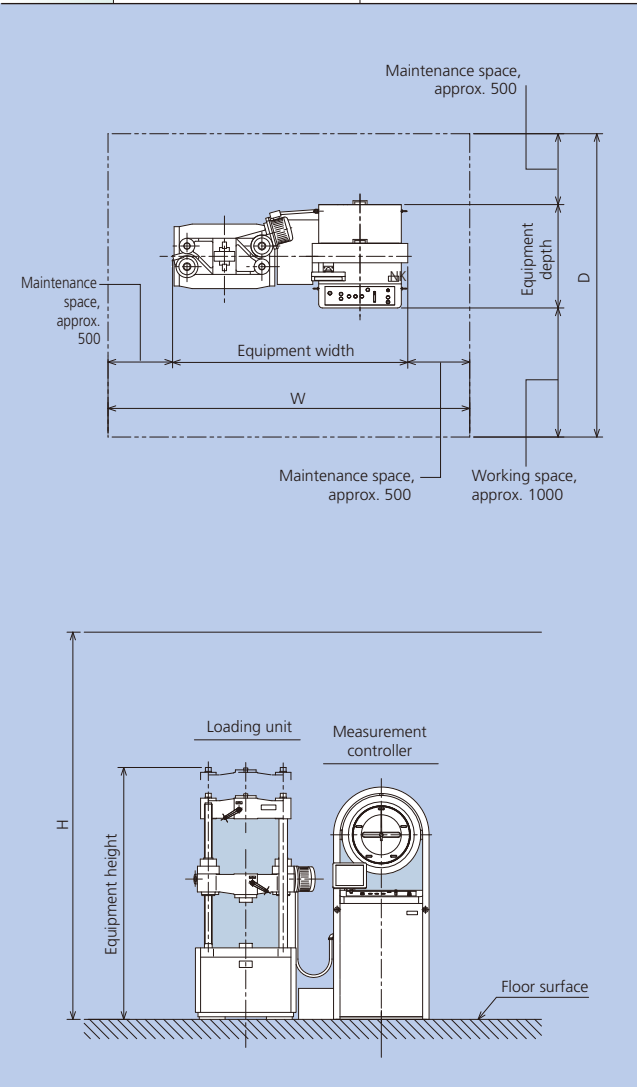
To install the universal testing machine, concrete foundation work is required. When purchasing this product, design and construct the foundation suitable for the conditions of the installation place (withstand strength of the ground, occupied space, etc.), referring to the foundation reference drawing supplied by Shimadzu Corporation.

## Occupied space recommended for the standard layout

\* For the dimensions of the testing machine loading unit and measurement controller of each type, see pp. 18 and 19.

Testing Machine		Recommended Occupied Space (W × D × H mm)
Series Name	Capacity	
UH-X	200kN	2800×2350×2500
	300kN	2800×2350×2500
	500kN/600kN	3000×2350×3000
	1000kN	3300×2400×3500

Testing Machine		Recommended Occupied Space (W × D × H mm)
Series Name	Capacity	
UH-X	2000kN	4600×3500×4000
	3000kN	5300×3900×5000
	4000kN	5800×4300×6000



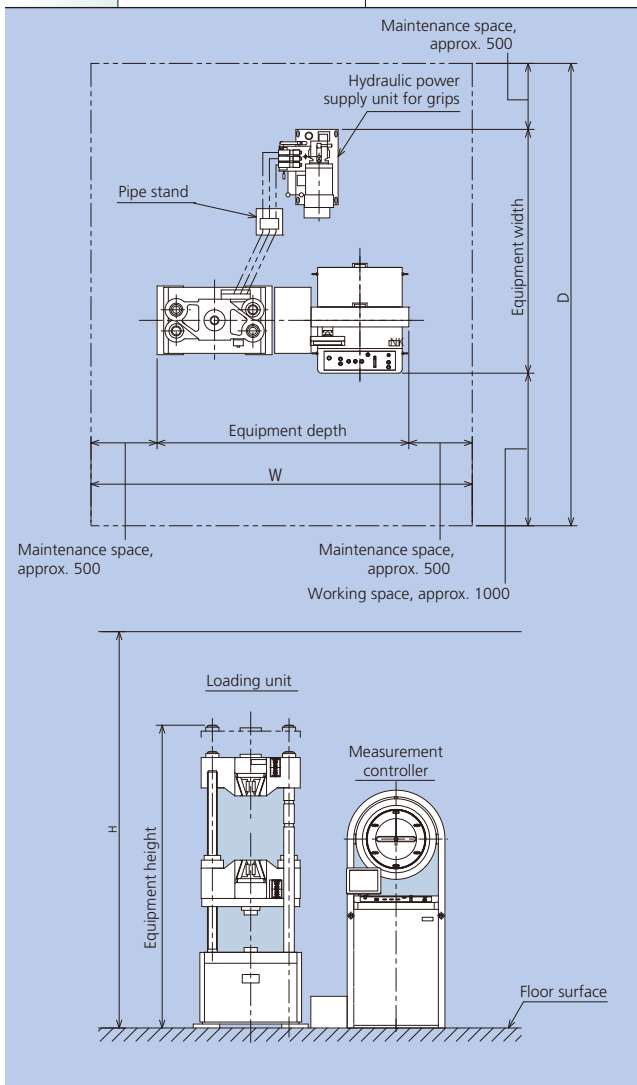


## 1. Installation environment

Avoid installing the UH-X/FX series in the following harsh environments:

- In a place where a large temperature fluctuation is expected (Recommended temperature: +5 °C to +40 °C)
- In a place where high humidity is expected (Make sure no condensation occurs in the installation place.)
- In a dusty place
- In a place where the equipment is exposed to vibration (Recommended vibration amplitude: 5  $\mu$ m or less)
- In a place contaminated by corrosive gas
- In a place where the equipment is directly exposed to vapor
- In a place where the equipment is directly exposed to sunlight

Testing Machine		Recommended Occupied Space (W × D × H mm)
Series Name	Capacity	
UH-FX	300kN	2900×3500×2900
	500kN	3100×3500×3500



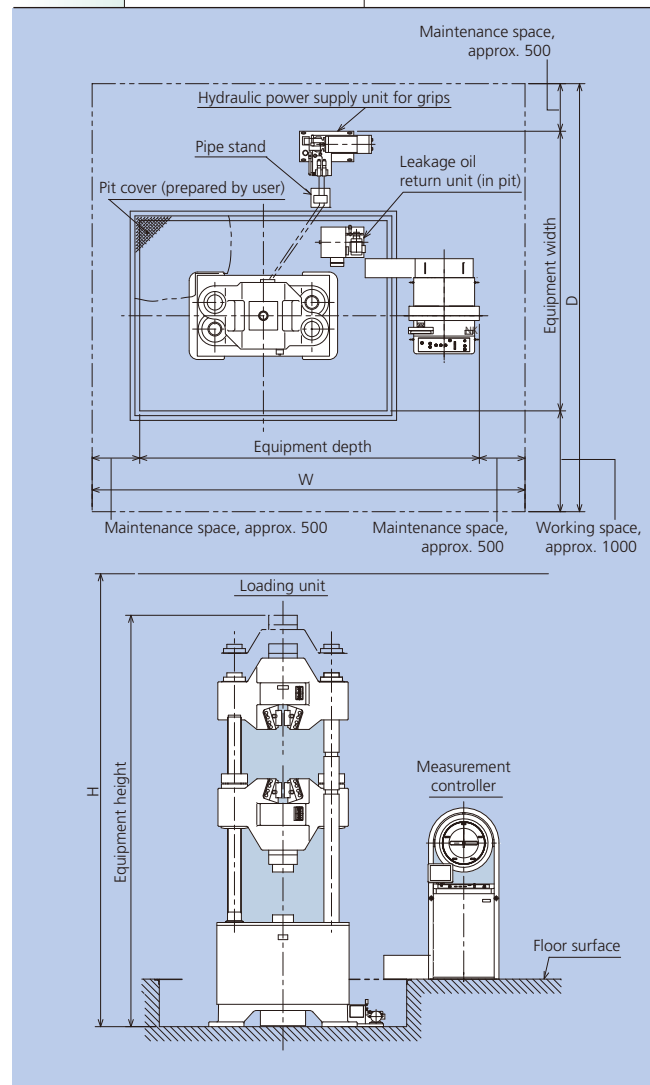
## 2. Requirements for power supply

- Conduct electric wiring work to the position shown in the foundation reference drawing.
- Avoid using a power supply with large voltage fluctuations. (Recommended voltage fluctuation level: Within  $\pm 10\%$ )  
If voltage fluctuations cannot be avoided, use a constant-voltage power supply.

## 3. Cooling water

To mount the optional hydraulic oil cooler, conduct water supply/drain piping work to the position shown in the foundation reference drawing supplied by Shimadzu Corporation.


Testing Machine		Recommended Occupied Space (W × D × H mm)
Series Name	Capacity	
UH-FX	1000kN	4500×4200×4300
	2000kN	4600×4500×5400
	3000kN	5000×4700×7100
	4000kN	5500×5000×7500



# UH-X and UH-FX Series – Loading Unit Standard Specifications

## Standard Series

### Model

Servo valve	Type	UH-200kNX	UH-300kNX	UH-F300kNX	UH-500kNX	UH-F500kNX
Hybrid	 Type	UH-200kNXh	UH-300kNXh	UH-F300kNXh	UH-500kNXh	UH-F500kNXh

### Capacity

Max. capacity	200kN	300kN	500kN
Force range	Rangeless	Rangeless	Rangeless
Analog indicator (option)	200/100/40/20/10/4kN	300/150/60/30/15/6kN	500/250/100/50/25/10kN

### Specifications

1. Tensile test	Max. grip span (mm)	800	800	800	900	
	Grip face for rod specimens (mm)	ø8 to 40, 1 type With liner	ø8 to 40, 1 type With liner	ø8 to 25 ø25 to 40 (option)	ø12 to 50, 1 type With liner	ø12 to 30 ø30 to 50 (option)
	Grip face for flat plate specimens (option) *3	0 to 35, 1 type (50 in width)	0 to 35, 1 type (50 in width)	0 to 20 20 to 40 (50 in width)	0 to 45, 1 type (60 in width)	0 to 30 30 to 50 (60 in width)
2. Compression test	Max. compression plate span (mm)	720	720	720	800	800
	Compression plate size (mm)	ø100	ø100	ø100	ø120	ø120
3. Transverse/ bending test (option) *4	Max. support span (mm)	500	500	500	600	600
	Support diameter x width (mm)	30x130	30x130	30x130	50x160	50x160
	Punch tip radius (mm)	15	15	15	25	25
	Punch width (mm)	130	130	130	160	160
4. Loading speed (50/60 Hz) (mm/min) *1	Servo valve Hybrid 	80/100 max. 100 max.	80/100 max. 100 max.	80/100 max. 100 max.	65/80 max. 100 max.	65/80 max. 100 max.
	Drive motor Servo valve Hybrid 	1.5kW 2.0kW	1.5kW 2.0kW	1.5kW 2.0kW	1.5kW 2.0kW	1.5kW 2.0kW
5. Ram stroke (mm)		200	200	200	250	250
6. Crosshead elevation speed (50/60 Hz) Drive motor		315/380 400W	315/380 400W	380/450 Hydraulic motor	375/450 750W	210/250 Hydraulic motor
7. Column span (mm)		500	500	500	650	650
8. Effective table dimensions (W x D) (mm)		500x500	500x500	500x500	650x650	650x650
9. Power supply capacity (Approx.) (3-phase, 200 V, 50 Hz/200 to 220 V, 60 Hz)	Servo valve Hybrid 	4kVA 6.5kVA	4kVA 6.5kVA	5.5kVA 8kVA	4.5kVA 7kVA	5.5kVA 8kVA
10. Recommended breaker capacity (3-phase, 200 V, 50 Hz/200 to 220 V, 60 Hz)	Servo valve Hybrid 	30A 40A	30A 40A	30A 50A	30A 40A	40A 50A
11. Testing machine size (W x D x H) Testing machine		780x500x2000	780x500x2000	870x520x2300	960x650x2400	1060x700x2900
	Measurement controller (mm)	740x800x1800	740x800x1800	740x800x1800	740x800x1800	740x800x1800
12. Testing machine weight Testing machine		900	900	1500	1700	2600
	Measurement controller (kg)	110	110	110	110	110

## Universal Testing Machines Extension Series

When the extension series of universal testing machines are used together with accessories, a wider range of tests can be performed.  
For details, refer to the catalogs for accessories and application testing systems.

### Testing Machine Loading Unit with Extended Columns

Applicable Testing Machine			Extension Model S		Extension Model M		Extension Model L	
Series Name	Capacity (kN)	Standard Grip Span (mm)	Extension Length (mm)	Allowable Tensile Force	Extension Length (mm)	Allowable Tensile Force	Extension Length (mm)	Allowable Tensile Force
UH-X	200・300	800			*400	Full force	600, top plate attached	200・250
	500・600	900	*300	Full force	500, top plate attached	400	800, top plate attached	300
	1000	1000	*200	Full force	500, top plate attached	Full force	800, top plate attached	700
	2000	1100	*200	Full force	500, top plate attached	Full force	800, top plate attached	1700
UH-FX	300	800	200	Full force	*400, top plate attached	Full force	600, top plate attached	150
	500	900	*300	320	500, top plate attached	250	800, top plate attached	200
	1000	1000	*200	800	500, top plate attached	600	800, top plate attached	500
	2000	1100	*200	1800	500, top plate attached	1500	800, top plate attached	1300

NOTE:

- 1) In the above table, the \* mark indicates the extension length required to mount the thermostatic chamber or furnace.
- 2) The allowable tensile force is limited at the extended part of the column. The compression force will not be limited.

	UH-600kNX	UH-1000kNX	UH-F1000kNX
	UH-600kNXh	UH-1000kNXh	UH-F1000kNXh

	600kN	1000kN
	Rangeless	Rangeless
	600/300/120/ 60/30/12kN	100/500/200/100/50/20kN

	900	1000	
	ø12 to 50, 1 type With liner	ø12 to 70, 1 type With liner	ø12 to 40 ø40 to 70 (option)
	0 to 45, 1 type (60 in width)	0 to 65, 1 type (70 in width)	0 to 35 35 to 70 (70 in width)
	800	900	900
	ø120	ø160	ø160
	600	800	800
	50×160	50×160	50×160
	25	25	25
	160	160	160
	65/80 max. 100 max.	50/70 max. 90 max.	50/70 max. 90 max.
	1.5kW 2.0kW	2.2kW 4.4kW	2.2kW 4.4kW
	250	250	250
	375/450 750W	330/400 1.5kW	160/200 Hydraulic motor
	650	750	750
	650×650	750×750	750×750
	4.5kVA 7kVA	6.5kVA 12kVA	7kVA 12kVA
	30A 40A	40A 75A	40A 75A
	960×650×2400	1170×750×2800	1320×800×3400
	740×800×1800	740×800×1800	740×1000×1800
	1700	3500	6000
	110	110	110

## Hydraulic Oil Cooler

To perform hold control or an equivalent test continuously for 30 minutes or longer, the hydraulic oil cooler may be required.

Series Name	Capacity (kN)
UH-X UH-FX	200・300
	500
	600 (UH-X)
	1000
	2000

NOTE: Conduct water supply/drain piping work to the position shown in the foundation reference drawing supplied by Shimadzu Corporation.

## Large-Capacity Series

UH-2000kNX	UH-F2000kNX	UH-3000kNX	UH-F3000kNX	UH-4000kNX	UH-F4000kNX
UH-2000kNXh	UH-F2000kNXh	—	—	—	—

2000kN	3000kN	4000kN
Rangeless	Rangeless	Rangeless
2000/1000/400/200/100/40kN	3000/1500/600/300/150/60kN	4000/2000/800/400/200/80kN

1100		1200		1400	
ø20 to 90, 1 type With liner	ø20 to 55 ø55 to 90 (option)	ø20 to 110, 1 type With liner	ø20 to 55 ø55 to 85 (option)	ø30 to 120, 1 type With liner	ø20 to 60 ø60 to 90 (option) ø90 to 120 (option)
0 to 85, 1 type (90 in width)	0 to 45 45 to 90 (90 in width)	0 to 105, 1 type (110 in width)	0 to 55 55 to 110 (110 in width)	0 to 115, 1 type (120 in width)	0 to 60 60 to 120 (120 in width)
950	950	1000	1000	1150	1150
ø220	ø220	ø280	ø280	ø300	ø300
900	900	1000	1000	1000	1000
70×200	70×200	80×230	80×230	80×250	80×250
30,40	30,40	40,50	40,50	40,50	40,50
160	160	230	230	250	250
40/50 max. 90 max.	40/50 max. 90 max.	40/50 max. —	40/50 max. —	40/50 max. —	40/50 max. —
5.5kW 4.4kW	5.5kW 4.4kW	5.5kW —	5.5kW —	7.5kW —	7.5kW —
300	300	300	300	350	350
290/350	290/350	290/350	290/350	290/350	290/350
1.5kW	2.2kW	2.2kW	3.7kW	3.7kW	5.5kW
750	850	1000	1000	1150	1150
850×850	850×850	1000×1000	1000×1000	1150×1150	1150×1150
12kVA	15kVA	11kVA	15kVA	16kVA	18kVA
12kVA	15kVA	60A	75A	100A	100A
75A	100A	—	—	—	—
75A	100A	—	—	—	—
1560×920×3400	1560×920×4500	1860×1100×3970	1860×1100×5700	2200×1400×4800	2200×1400×5900
740×1000×1800	740×1000×1800	740×800×1800	740×800×1800	740×800×1800	740×800×1800

### NOTE

- 1) The UH-X/FX series provides the above loading speeds when no load is applied and the oil temperature is 20 °C or higher.
- 2) The hydraulic loading system is incorporated in the measurement controller. (For testing machines with 3000 kN or higher capacity, the hydraulic loading system is separately provided.)
- 3) Only one type of tensile testing grip faces (for round rod specimens) are included standard.  
Other types of grip faces are optional.  
These standard grip faces are designed for use with specimens with a hardness of HRC30 or less.
- 4) The transverse/bending test jigs are options.
- 5) For a different paint color, contact your Shimadzu representative.

NOTE: The large-capacity series is produced at customers' request. For details, contact your Shimadzu representative.

# UH-X and UH-FX Series – Measurement Controller Standard Specifications

		UH-X / UH-FX	UH-Xhi / UH-FXhi
1. Loading method		Computer-controlled electro-hydraulic servo system	Computer-controlled electro-hydraulic hybrid system
2. Force measurement	Method	Cylinder internal pressure measurement with high-precision pressure cell	
	Precision standard type	Within $\pm 1.0$ % of indicated value (when the force is 1/1 to 1/250 of rated value) (Conforming to JIS 87721 Class 1, ISO 7500/1 Class 1, and ASTM E4)*1	
	High-precision type (option)	Within $\pm 0.5$ % of indicated value (when the force is 1/1 to 1/250 of rated value) (Conforming to JIS 87721 Class 0.5, ISO 7500/1 Class 0.5, and ASTM E4)*1	
	Magnification	Rangeless	
3. Force display	Operation unit	Digital display Min. display resolution: 1/200,000 (300 kN/3000 kN: 1/240,000)	
	Analog force indicator*2	Analog display Scale plate diameter: 450 mm; Min. scale: 1/1000 (300 kN/3000 kN: 1/600)	
		Digital display Min. display resolution: 1/200,000 (300 kN/3000 kN: 1/240,000)	
4. Stroke measurement display		Measurement with optical encoder; digital display (resolution: 0.01 mm)	
5. Automatic load control	Method	Fully closed-loop automatic load control	
	Test control functions	Single test control, Cycle test control (triangular wave, trapezoidal wave), Stress test control (metal tensile test control: compliant with ISO 6892-2009/JIS Z2241), Strain test control (metal tensile test control: compliant with ISO 6892-2009), Stroke speed 3-step switching control, Concrete test control (compression, bending, cleavage tests)	
	Range	Ram stroke control	Speed range: 0.1 mm/min to max. loading speed*3 Control range: Ram return point to max. ram stroke
		Test force control	Speed range: 0.2 % to 500 % full-scale/min Control range: 0.4 % to 100 % of full-scale force
		Strain control	Speed range: 0.1 % to 80 %/min Control range: 5 % to 100 % of full-scale elongation
6. Input/output interface		External analog input: 2 CH; External analog output: 2 CH External digital input: 2 CH (optional); Internal amplifiers possible: 2 ports Analog recorder (optional) output, USB function (for computer) / Host (for USB memory) interface, and Dataletty (optional) output	
7. Standard function		Auto-test force-strain control (with auto-tuning), Test force auto-zero, Test force auto-calibration, Break detecting (break sensitivity, break level, break peak level, and high sensitivity), Auto-return, Arbitrary stroke speed setting, Stroke speed preset, Cycle count, Stress value display, Displacement meter value display, PEAK/BREAK value display, Test condition files (100 files), Japanese/English display, S-S curve display, Specimen protection, Current speed display, and Manual load control	
8. Safety devices		Overload automatic stop (When the test force value exceeds 102 % of the full-scale value, the loading pump automatically stops.) Software limit detection (automatically stops test upon reaching limit setting value) Control automatic stop (When an excessive control deviation is reached, the test automatically stops.)	

\*1 Calibration is required after installation to provide conformance.

\*2 Models without an analog test force indicator are also available.

\*3 For the maximum loading speed, refer to the testing machine specifications.



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