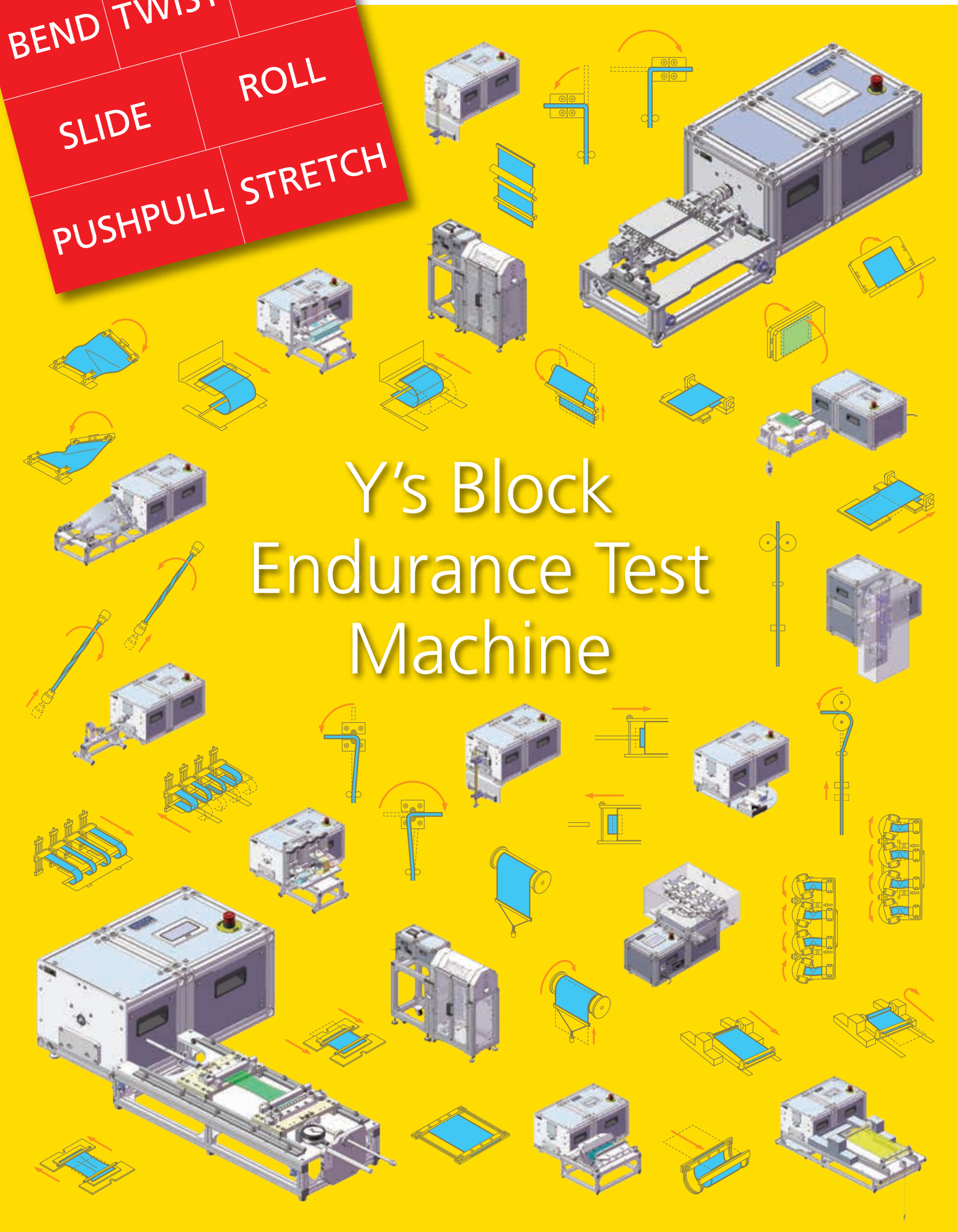
YUASA
YUASA SYSTEM CO., LTD.

7 Basic Motions

BEND | TWIST | FOLD

SLIDE | ROLL

PUSHPULL | STRETCH

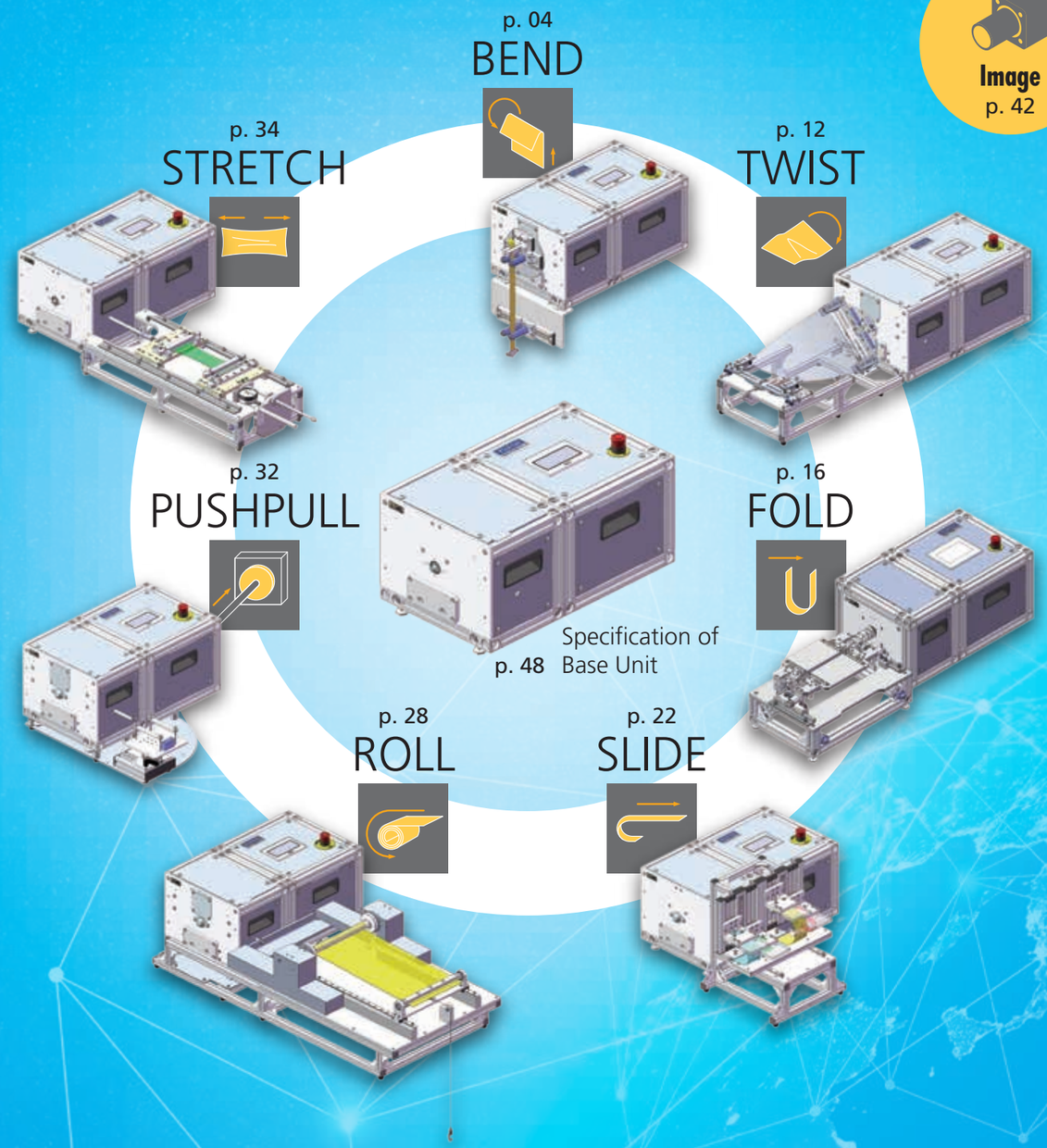


Y's Block Endurance Test Machine

A Wide Range of Endurance Tests with Our Machine

Y's Block Endurance Test Machine

We can do various tests by changing the test jig.
This machine is quiet and space-saving design.



Image
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Measuring
p. 42

Environment
p. 38

p. 46
flexdata

Certification

Experiment planning

Analytics

Storage

Data management

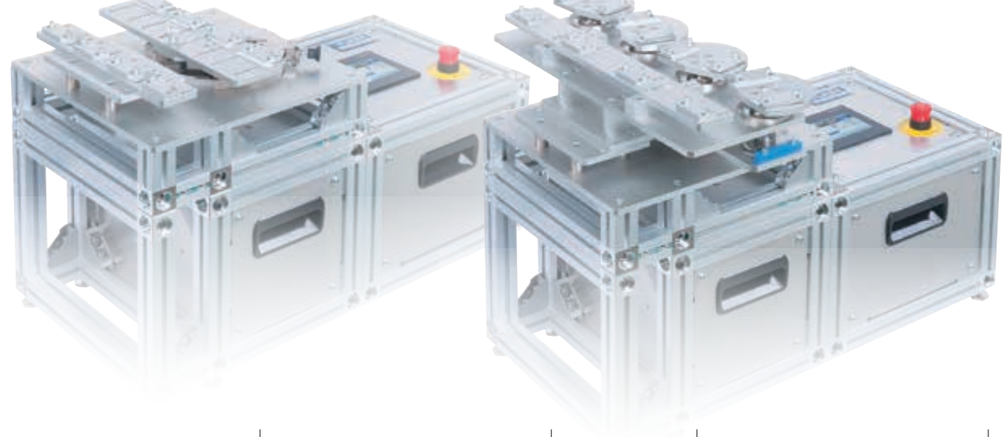
Get data in real time, from anywhere in the world.

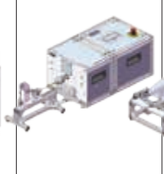
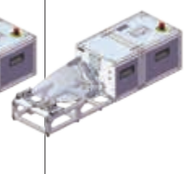
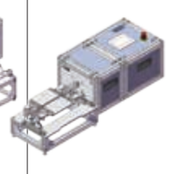
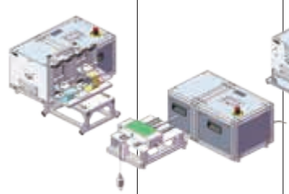
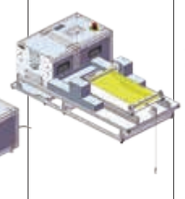
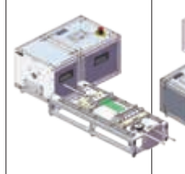
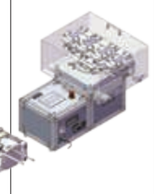
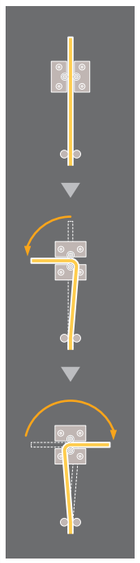
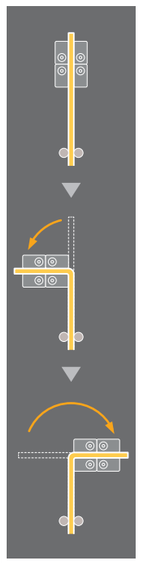
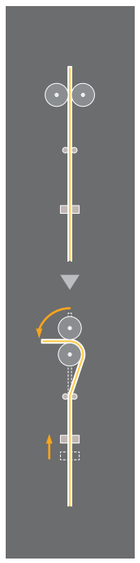
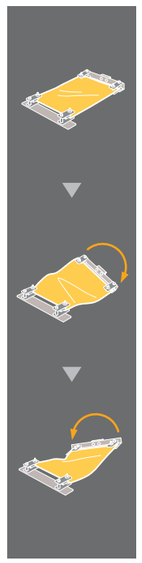
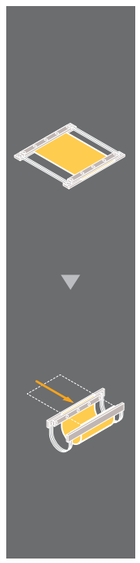
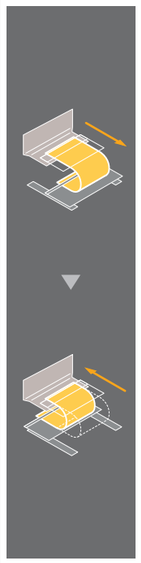
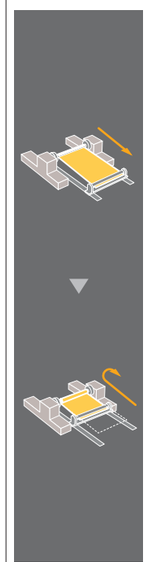
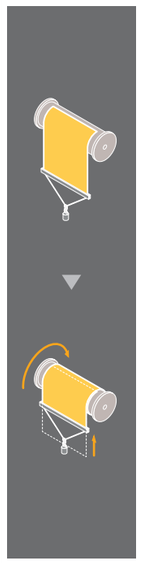
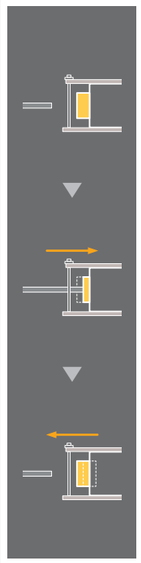
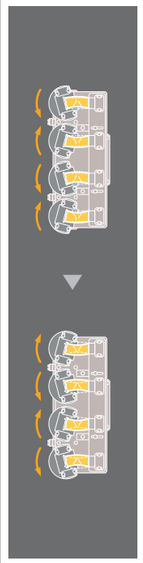
New platform "Flexdata" enables the users to monitor testing data in real time from anywhere in the world, moreover to analyze or save the data, and also to program the test or the measure on the cloud.

Basic Motions

Y's Block Endurance Test Machine provide

7 Basic Motions



BEND				TWIST		FOLD		SLIDE			ROLL		PUSHPULL	STRETCH	
DR11SRB-P150	DR11SRB-C□BR	–	–	DR11SRB-TW	DR11SRB-FT	DR11SRB-FS DR11SRB-FS-C	–	DR11SRB-FU	DR11SRB-4U	DR11SRB-SU	DR11SRB-FR	–	DR11SRB-PP	–	–
DR11SRP-P150	DR11SRP-C□BR	–	–	DR11SRP-TW	DR11SRP-FT	DR11SRP-FS DR11SRP-FS-C	DR11SRP-CS	DR11SRP-FU	DR11SRP-4U	DR11SRP-SU	DR11SRP-FR	–	DR11SRP-PP	DR11SRP-ST	–
DR11MR-P220 DR11MR3-P220	DR11MR-C□BR DR11MR3-C□BR	DR11MR3-TFB	DR11MR-BTFB	DR11MR-TW	DR11MR-FT	–	DR11MR-CS / CS-t / CS-m	–	–	–	–	DR11MR-FR	–	–	DR11MR3-L4S / R4S / L2U
Bending Test P150/220 Type (ø150/220 Faceplate)	Bending Test CBR Type (Centripetal Clamp Faceplate)	Bending Test TFB Type	Bending Test BTFB Type	Twisting Test TW Type	Twisting Test FT Type	Folding Test FS / FS-C Type	Folding Test CS Type	Sliding Test FU Type (1-lane)	Sliding Test 4U Type (4-lane)	Sliding Test SU Type	Rolling Test FR Type	Rolling Test FR Type	Pushing / Pulling Test PP Type	Stretching Test ST Type	Linear Reciprocation Test LS Type Rotation Reciprocation Test RS Type Sliding Test LU Type
															
P150 / 220	CBR	TFB	BTFB	TW	FT	FS	CS	FU	4U	SU	FR	FR	PP	ST	L4S / R4S / L2U
															
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Y's Block
Endurance Test Machine

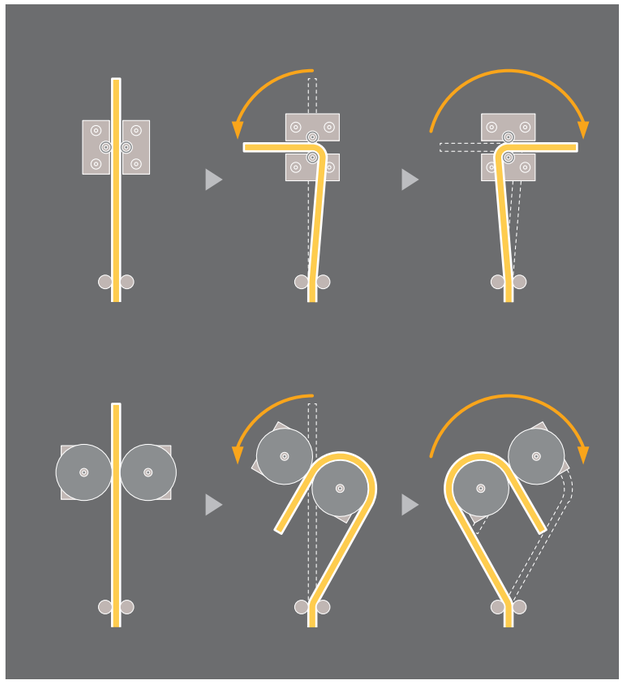
Bending Test P150/220 Type (ø150/220 Faceplate)

Bending Test for Linear or Belt shaped sample

Type DR11SRB-P150 / DR11SRP-P150
DR11MR-P220 / DR11MR3-P220

Using an object such as cable, harness, element wire and fine line as well as belt-shaped objects up to 30mm in width, various bending tests are conducted quickly and easily.

Sample / Jig Movement



Attachment (Test Jig)

Bend Radius:10mm (Accessory)

A two-piece set of bend radius jig (mandrel) holds a test piece and bend it.

Bend Radius:40mm (max.)

Maximum bending radius is R40mm, operating range is up to ±180°.

It is possible to change the bend radius from 2.5mm - 40mm.

Bend Radius: 2.5mm (min.)

Bend Radius: 30mm

• • •

A wide range of bending tests confirming to JIS

Based on JIS, this machine offers many different tests such as cable tests using weights. Moreover, belt-shaped objects like FFCs and FPCs up to 30mm in width will be tested.

Free bending angle up to ±180°

A test piece and operating angle determine an operating angle.
(ex.ø2mm Copper Wire : ±90° → 120r/min / ±180° → 60r/min)

Connector test without bending radius

Please ask us about the clamp jig.

Related tests or tests for reference https://www.yuasa-system.jp/en/

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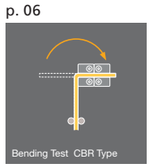
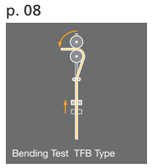


test/y-c4br/

p. 08



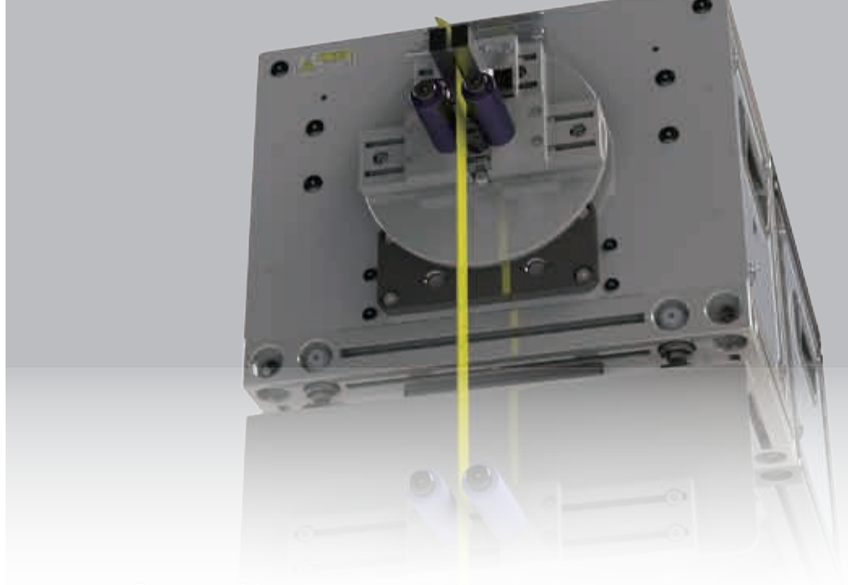
test/y-tfb/

p. 10

test/y-btfb/

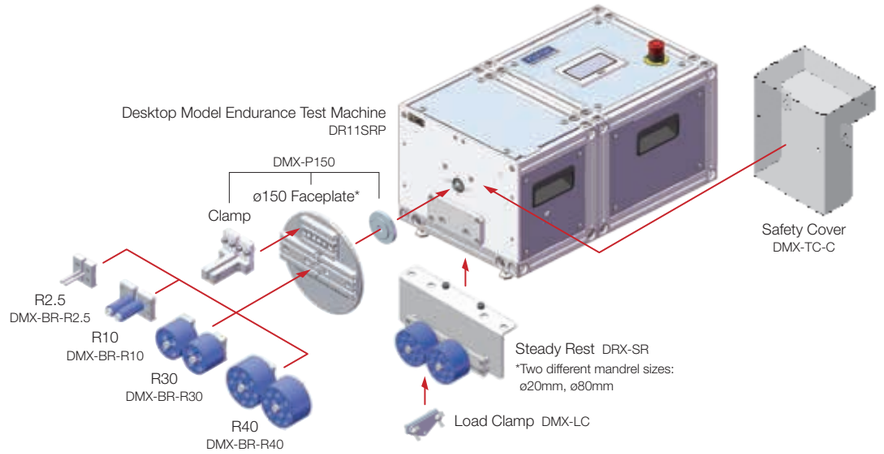
MODELS test/y-p220/

You can download the specification.



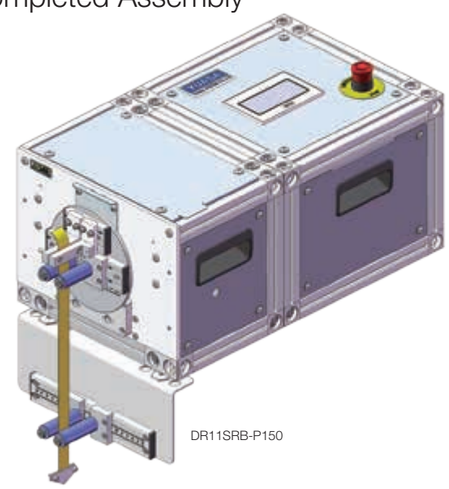
DR11SRB-P150

Composition



*ø220 bending face plate (R=220mm)" is also applicable. Those plates shall be exchanged in accordance to the testing condition. Please contact us for detail.

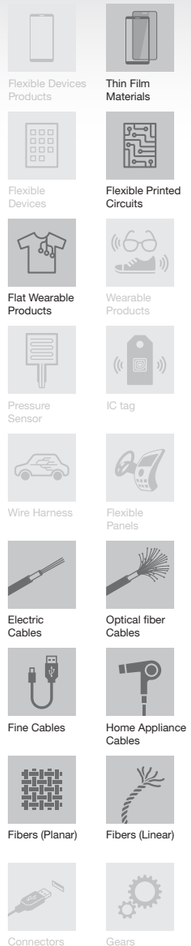
Drawing of Completed Assembly



DR11SRB-P150

BEND

Example of Test Pieces



inquiry/

If you have any question, please ask us.

Y's Block
Endurance Test Machine

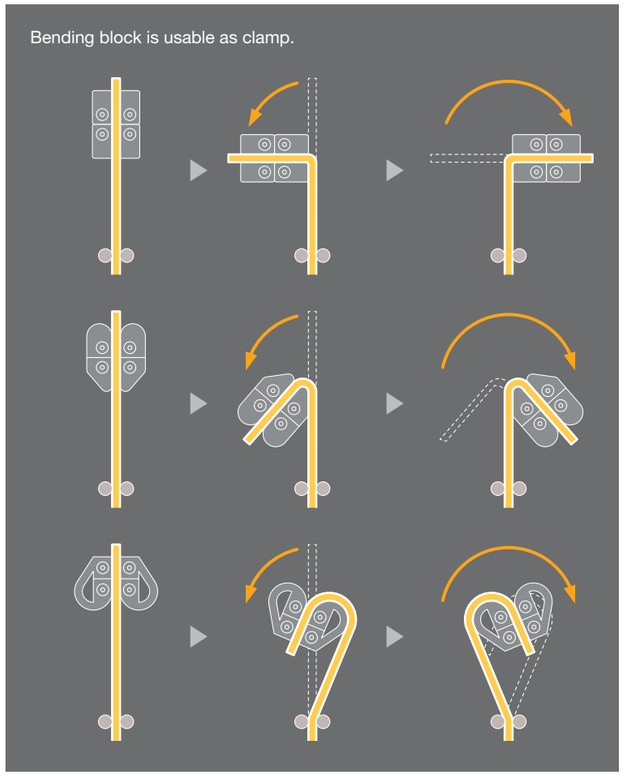
Bending Test CBR Type (Centripetal Clamp Faceplate)

Small Bending R Test for Linear or Belt type samples by the Testing Jig integrated with clamp

Type DR11SRB-C□BR / DR11SRP-C□BR
DR11MR-C□BR / DR11MR3-C□BR

With an effective combination of the clamp and bending radius blocks(R-block), a wide range of bending tests will be performed.
This machine is made for testing in smaller bend radii. There are some objects that can be tested with conventional mandrels.

Sample / Jig Movement



Attachment (Test Jig)

4R-block

Operating Range : up to ±90°
Requirements for R-Adjustment : up to R10mm
(Free setting per R0.5mm)

2R-block

Operating Range : up to ±135°
Requirements for R-Adjustment : R10 mm (Fixed),
and up to R11mm (Free setting per R0.5mm)

1R-block

Operating Range : up to ±180°
Requirements for R-Adjustment : R10 - 50mm (Free setting per R5mm)

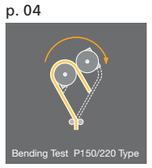
A broad range of bending tests in smaller radii

This machine provides you many different tests that are impossible to conduct with conventional mandrels.

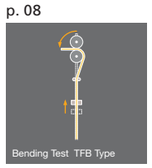
Up to four different bending radii for one R-block

In the case of 4R-block, setting up four different bending radii produces four different tests by changing the block positions from right to left, up and down. (Operating Range : up to ±90°)

Related tests or tests for reference https://www.yuasa-system.jp/en/

p. 04


test/y-p220/

p. 08


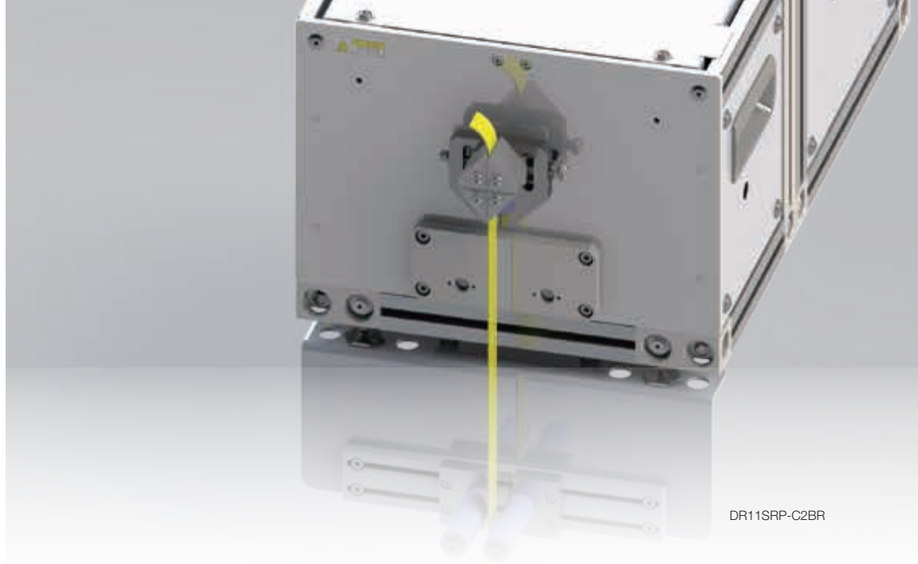
test/y-tfb/

p. 10


test/y-btfb/

MODELS test/y-c4br/

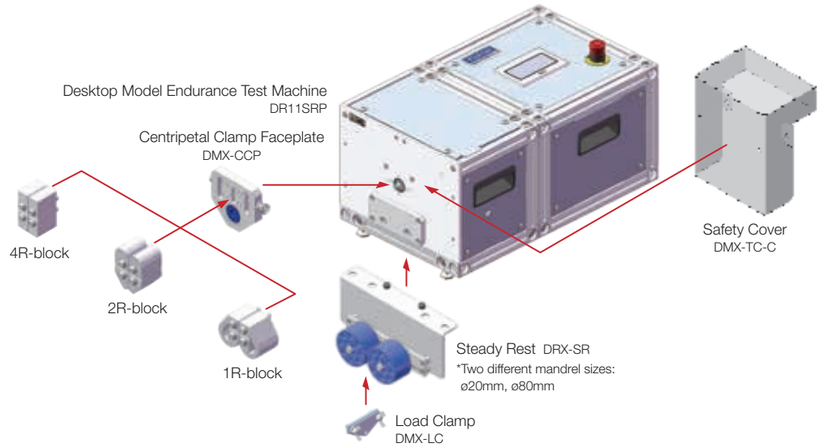
You can download the specification.



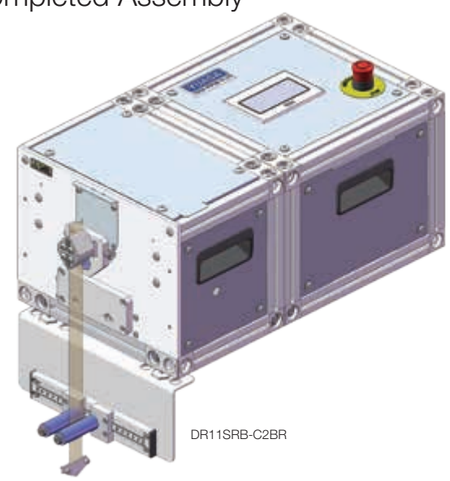
DR11SRP-C2BR

BEND

Composition

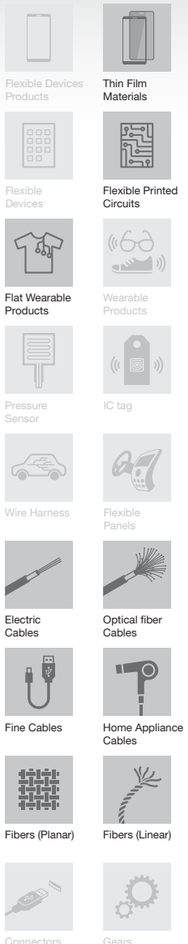


Drawing of Completed Assembly



DR11SRB-C2BR

Example of Test Pieces



inquiry/

If you have any question, please ask us.

*Refer to p. 48 regarding the driving unit specification.

Y's Block
Endurance Test Machine

Bending Test TFB Type

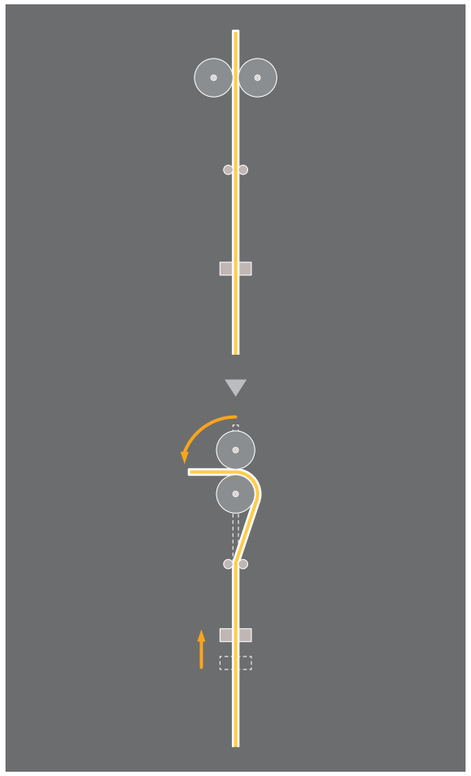
Tension Free™

Bending Test for Linear or Belt type sample without giving tension load

Type DR11MR3-TFB

Sample will slide in conjunction with the bending motion of driving clamp, so no tension load is applied on sample.

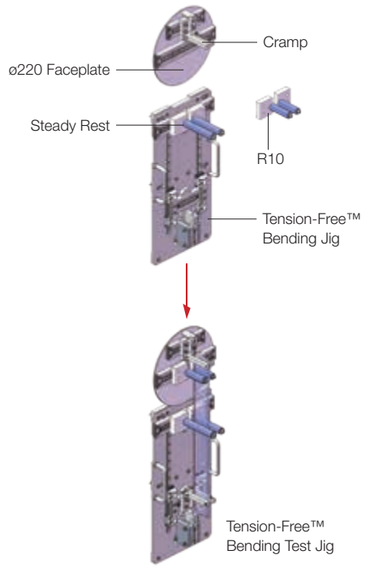
Sample / Jig Movement



Attachment (Test Jig)

Tension-Free™ Bending Jig

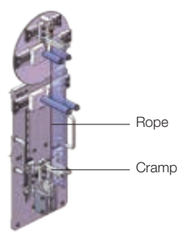
Lower clamp slides up and down together with the movement of sample bending.



Tension-Free™
Bending Test Jig

Bending test without giving tension by weight on sample, is available

The mechanism is, when clamp in swinging motion at drive part of endurance test, the other side of clamp slides in conjunction.

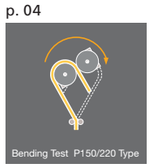


Bending angle bending speed can be set arbitrarily

0° - ±180°of bending angle, and 5 - 90 rounds/min. of bending speed can be set arbitrarily.

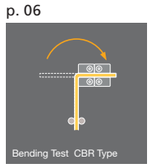
Related tests or tests for reference https://www.yuasa-system.jp/en/

p. 04



test/y-p220/

p. 06



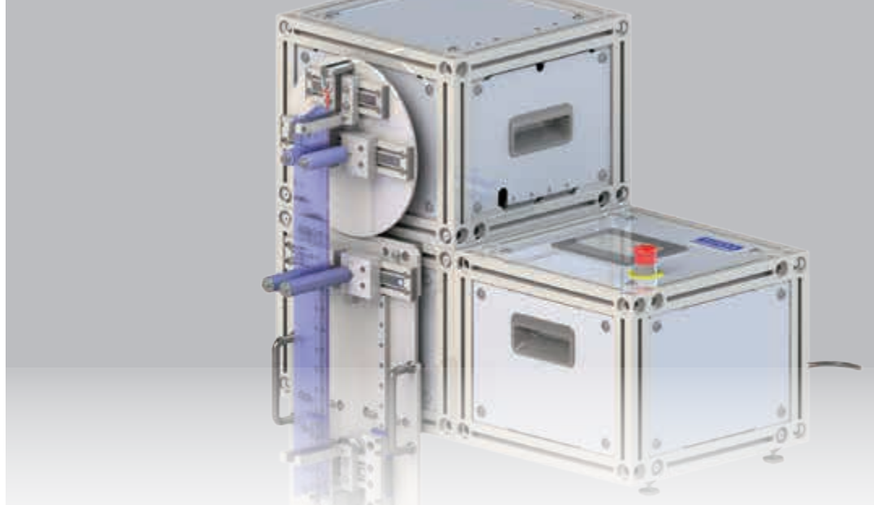
test/y-c4br/

p. 10

test/y-btfb/

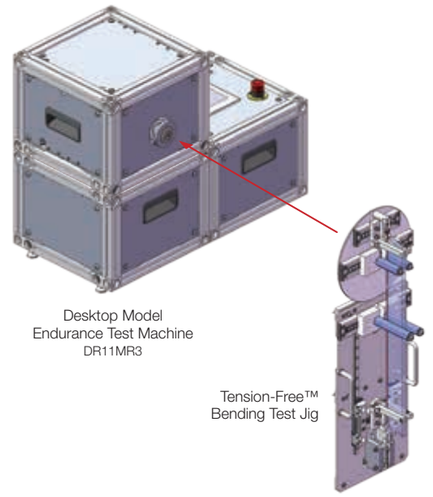
MODELS test/y-tfb/

You can download the specification.



DR11MR3-TFB

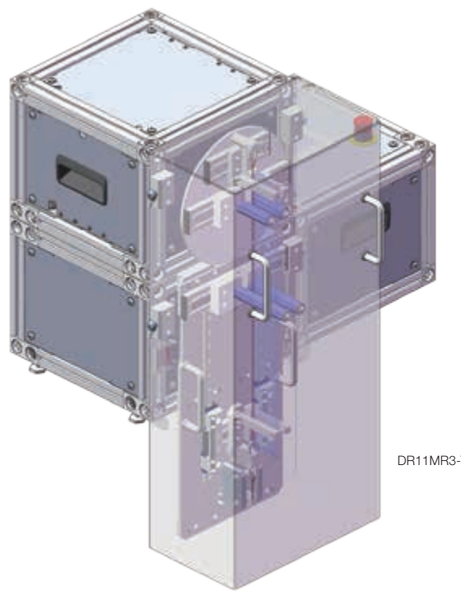
Composition



Desktop Model
Endurance Test Machine
DR11MR3

Tension-Free™
Bending Test Jig

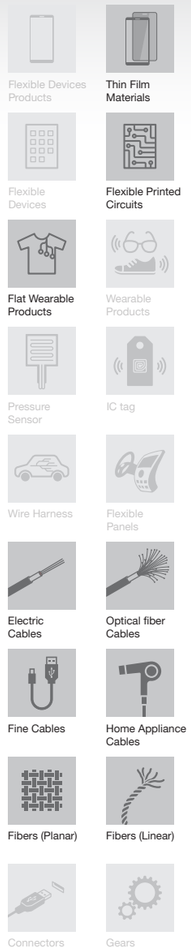
Drawing of Completed Assembly



DR11MR3-TFB

BEND

Example of Test Pieces



inquiry/

If you have any question, please ask us.

*Refer to p. 48 regarding the driving unit specification.

Y's Block
Endurance Test Machine

Bending Test BTFB Type

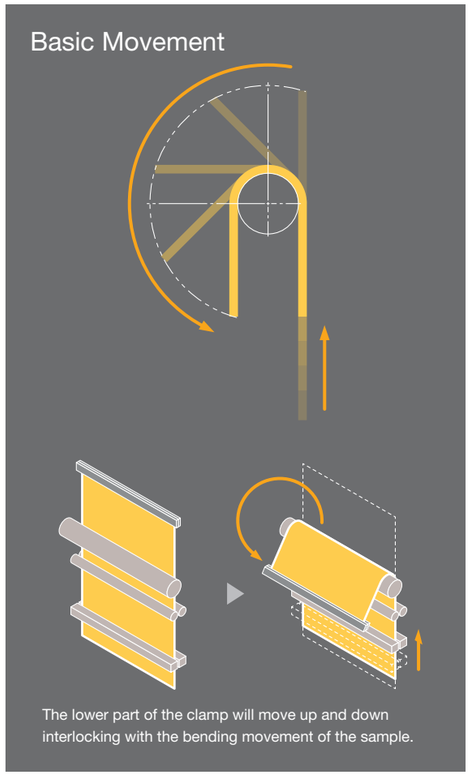
Tension Free™

Bending Test for Sheet type sample without giving tension load

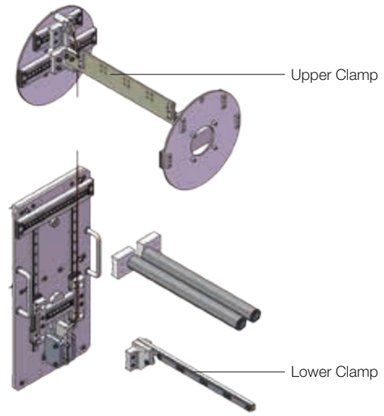
Type DR11MR-BTFB

This equipment uses a bending rod to keep the bending radius constant. The clamp moves in the circular motion having the same center point as the rod. The other end slides. There would be no tension applied to the sample.

Sample / Jig Movement



Attachment (Test Jig)

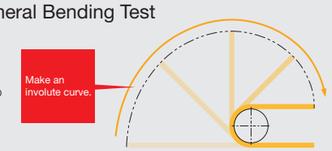


Tension-Free™ Bending Test Jig for Planar Object
DRX-BTFB

The mechanism is, by connecting the both sides of sample between clamps, at the timing when the clamp on drive part of endurance test machine in vibrate movement, the other side of clamp slides in conjunction with it.

Issues During General Bending Test

If the sample is bent along the rod, the edge of the sample will make an involute curve, making it hard to grab the sample, which makes it difficult to successfully perform the test.



This machine makes it possible to perform tension-free bending test on a planar sample such as flexible device

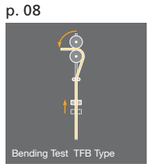
By changing the position of the clamp, one can perform tension-free bending test for planar objects that are card size to A4 size. Maximum bending angle is up to ±180°. One can bend one side only or both right and left side.

One can also use a weight when performing the bending test

By changing the tension-free test jig to the stabilizing jig, it will be possible to perform bending test using weights.

Related tests or tests for reference https://www.yuasa-system.jp/en/

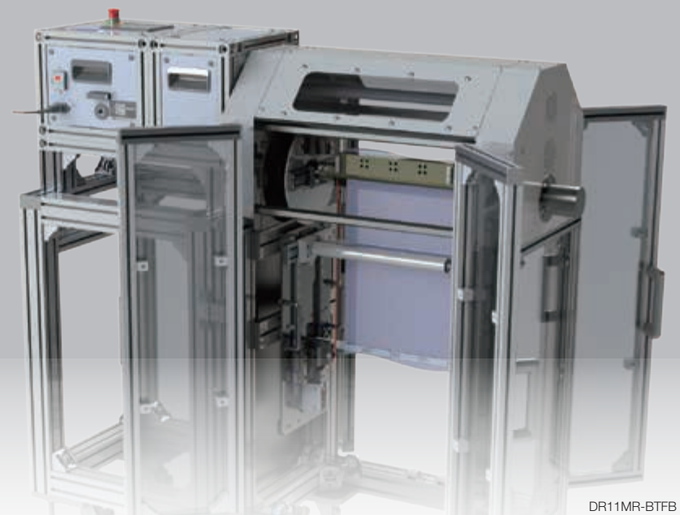
p. 08



test/y-tfb/

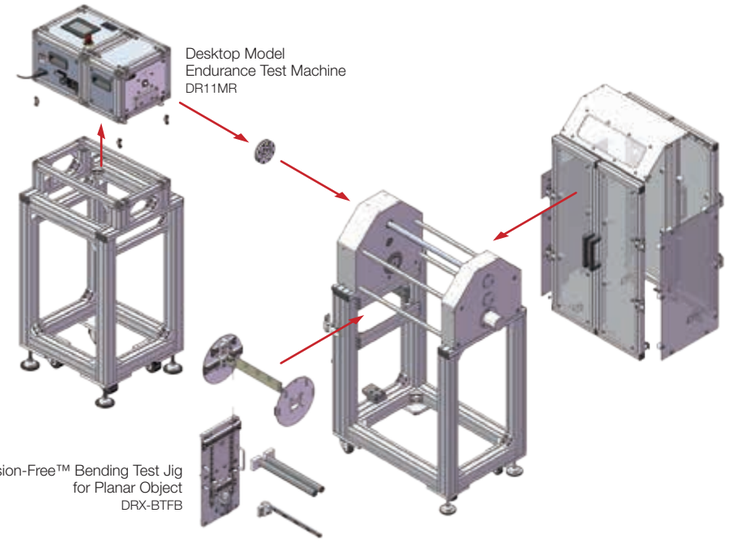
MODELS test/y-btfb/

You can download the specification.



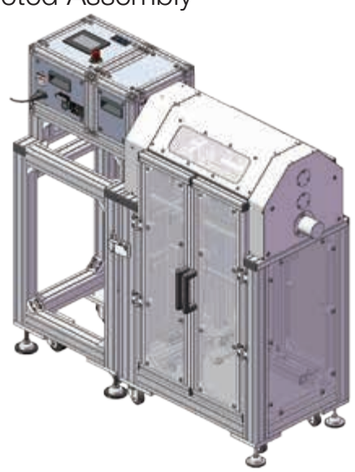
DR11MR-BTFB

Composition



Tension-Free™ Bending Test Jig for Planar Object
DRX-BTFB

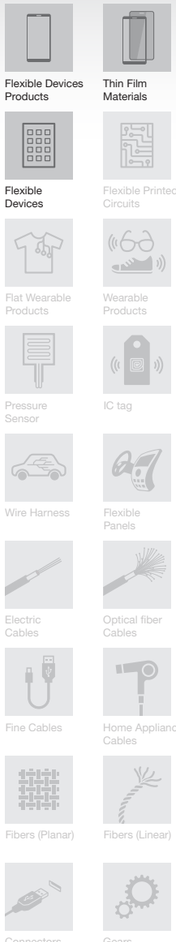
Drawing of Completed Assembly



DR11MR-BTFB

BEND

Example of Test Pieces



inquiry/

If you have any question, please ask us.

Y's Block
Endurance Test Machine

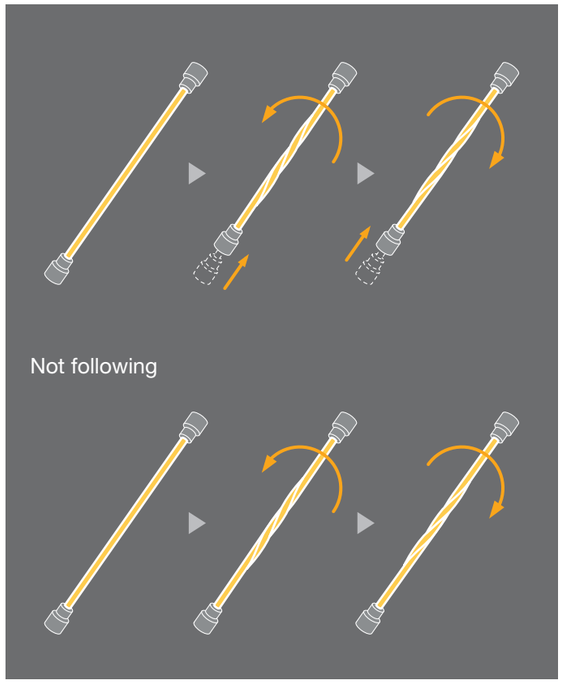
Twisting Test TW Type

Twisting test for Linear type sample

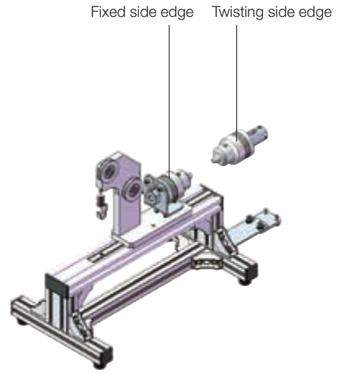
Type DR11SRB-TW / DR11SRP-TW / DR11MR-TW

This machine offers profitable tests for linear objects like cables and fibers.

Sample / Jig Movement



Attachment (Test Jig)



Torsion Test Jig for Linear Object
DMX-TW

Holding a test piece with the chuck jig, the output axis twists one end of the object while the jig frame secures the other end.

A wide range of twisting tests confirming to JIS

Based on JIS, this machine offers twisting tests of linear objects including cables, applying a tension from dead weights.

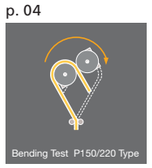
Free size of test pieces up to ø10mm

The size of test pieces is up to ø10mm. When using the sensor for detecting disconnection, the size is up to ø8mm in order to pass a lead through the jig. The size is up to ø1mm, the clamp uses Pin Vise.

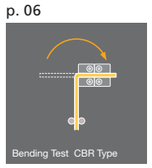
Both 10 revolutions twisting test

Regarding the driving unit of positioning type "DR11MR", it can do torsion test both maximum 10 revolutions right and left.
Twisting number is not limited when twisting is in one direction.

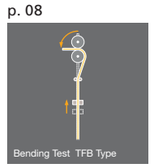
Related tests or tests for reference https://www.yuasa-system.jp/en/

p. 04


test/y-p220/

p. 06


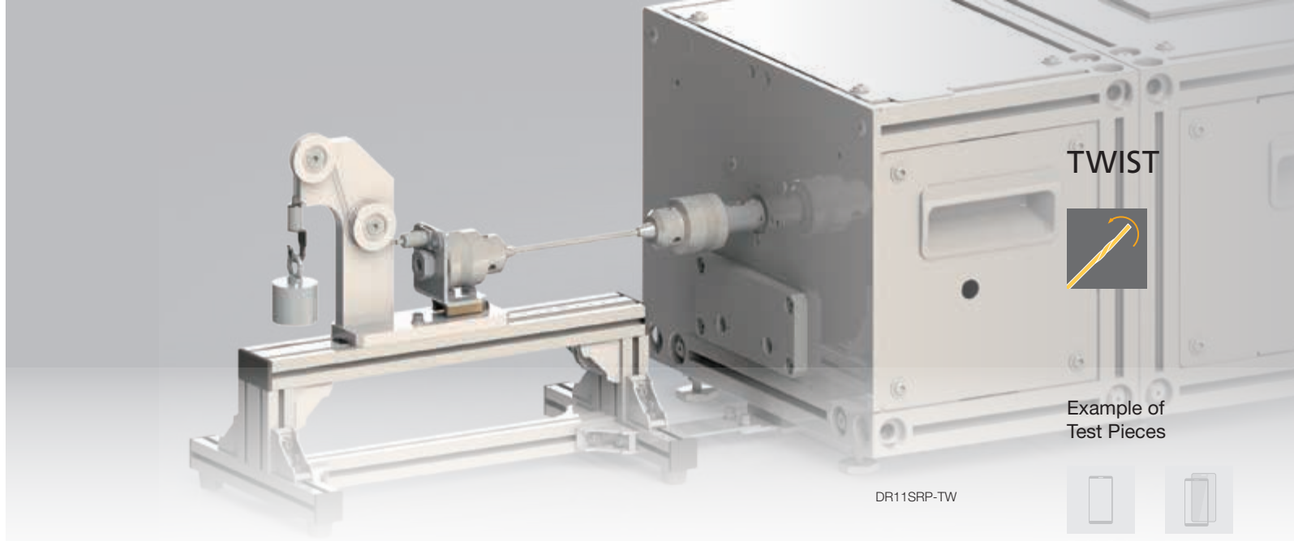
test/y-c4br/

p. 08


test/y-tfb/

MODELS test/y-tw/

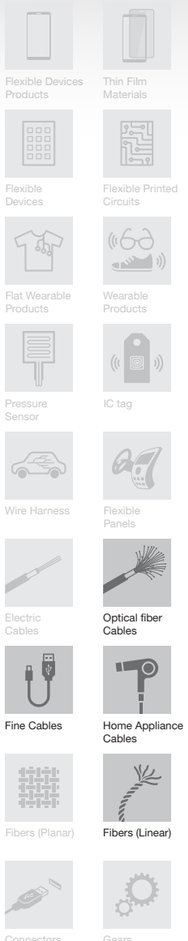
You can download the specification.



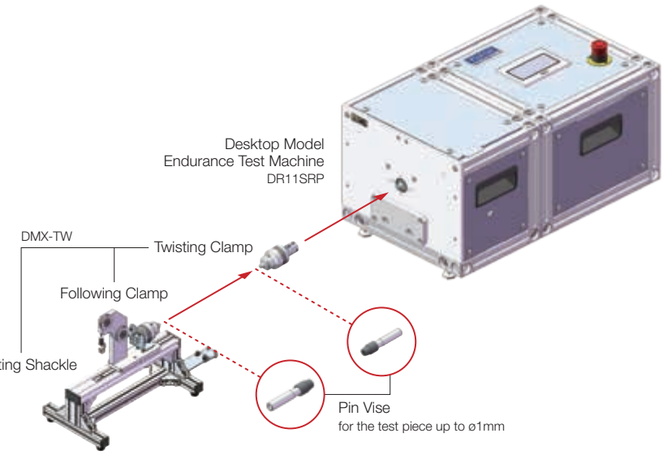
DR11SRP-TW

TWIST

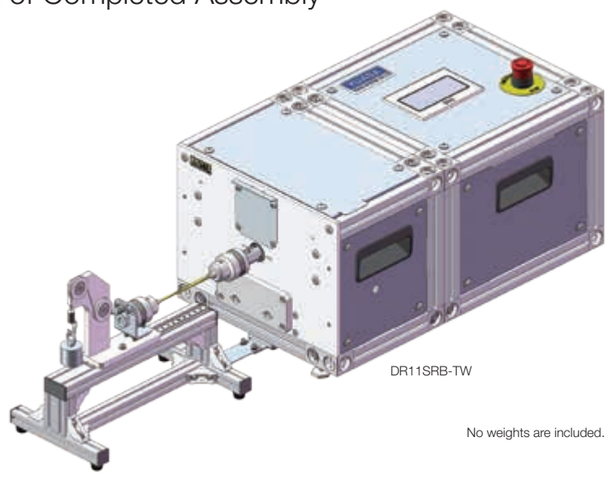
Example of Test Pieces



Composition



Drawing of Completed Assembly



DR11SRB-TW

No weights are included.

inquiry/

If you have any question, please ask us.

*Refer to p. 48 regarding the driving unit specification.

Y's Block
Endurance Test Machine

Twisting Test FT Type

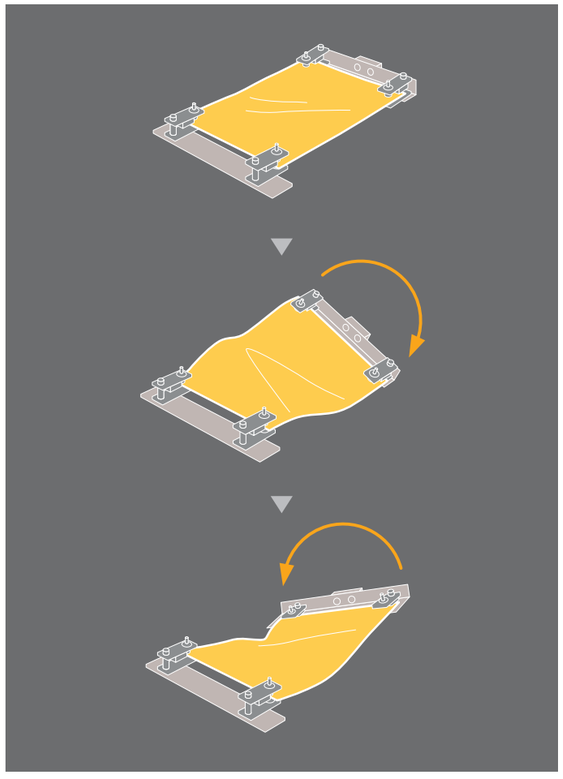
Tension Free™

Twisting test for Sheet type sample

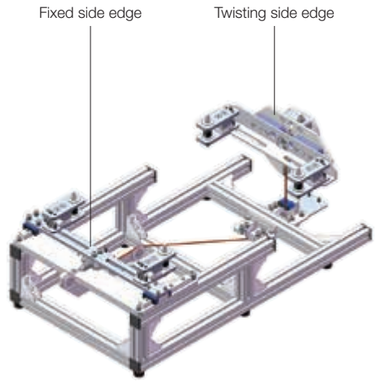
Type DR11SRB-FT / DR11SRP-FT / DR11MR-FT

This machine realizes profitable tests for planar objects like flexible devices and wearable devices.

Sample / Jig Movement



Attachment (Test Jig)



Tension-Free™ Torsion Test Jig for Planar Object
DMX-FT

Holding a test piece with the clump jig, the output axis twists one edge of the object while the jig frame clump secures the other edge.

Twisting tests without a tension

Using a string to connect the fixing clamp and the twisting clamp, the fixing clamp reciprocates straight along with twisting. This system prevents developing a tension on a test piece.

4-point clamping

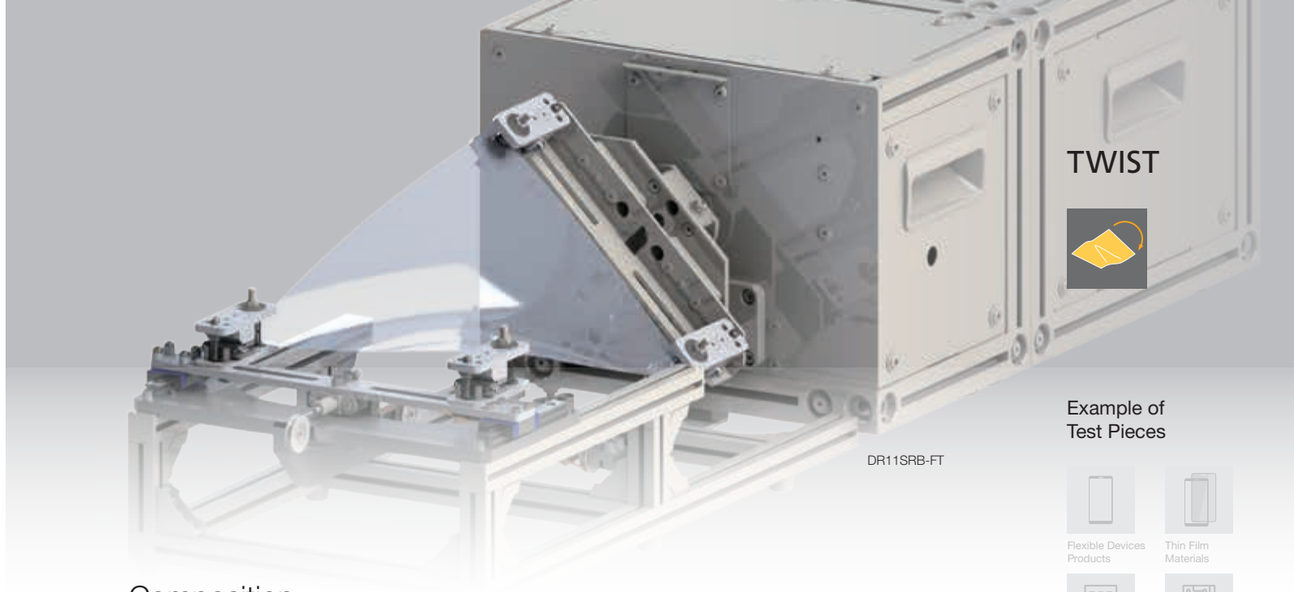
Twisting a planar object produces a tension at the center of it. In other words, the tension pulls the corners. To twist more effectively and smoothly, we introduce four separated clamps in the jig. (patented)

Related tests or tests for reference https://www.yuasa-system.jp/en/

p. 10 Bending Test BTFB Type — test/y-btfb/
p. 28 Rolling Test FR Type — test/y-sfr/
p. 30 Rolling Test FR Type — test/y-fr/
p. 34 Stretching Test ST Type — test/y-st/
p. 36 Linear Reciprocation Test LS Type — test/y-l4s/

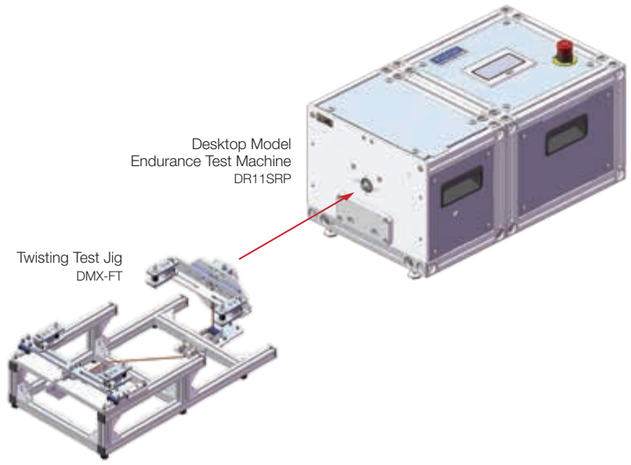
MODELS test/y-ft/

You can download the specification.

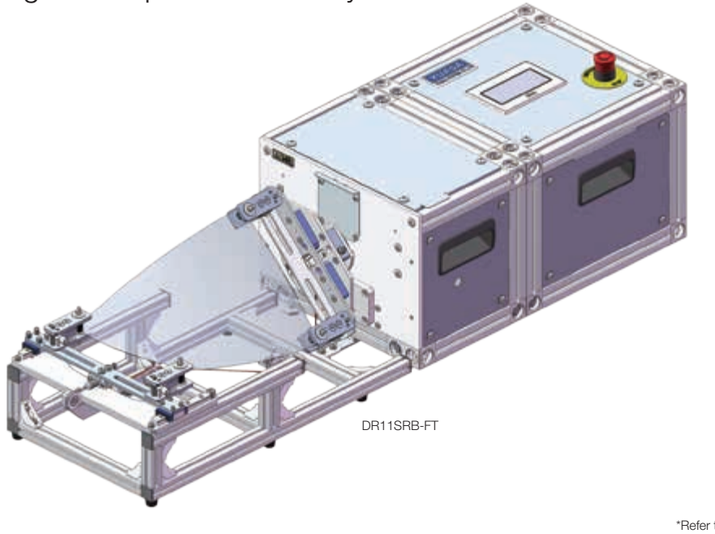


DR11SRB-FT

Composition



Drawing of Completed Assembly



DR11SRB-FT

Example of Test Pieces

- Flexible Devices Products
- Thin Film Materials
- Flexible Devices
- Flexible Printed Circuits
- **Flat Wearable Products**
- Wearable Products
- Pressure Sensor
- IC tag
- Wire Harness
- Flexible Panels
- Electric Cables
- Optical fiber Cables
- Fine Cables
- Home Appliance Cables
- **Fibers (Planar)**
- Fibers (Linear)
- Connectors
- Gears

inquiry/

If you have any question, please ask us.

*Refer to p. 48 regarding the driving unit specification.

Y's Block
Endurance Test Machine

Folding Test FS / FS-C Type

Tension Free™

Friction Free

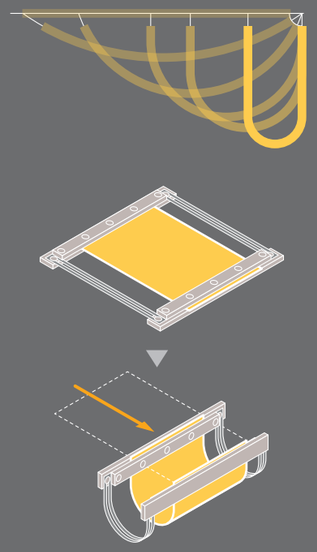
Bending Test for Sheet type sample without tension nor friction

Type DR11SRB-FS / DR11SRP-FS
DR11SRB-FS-C (Cartridge-type) / DR11SRP-FS-C (Cartridge-type)

The bending load is applied by having one side of the sample move straight towards the other side.
The sample only receives bending load so there are no applied tension or friction.

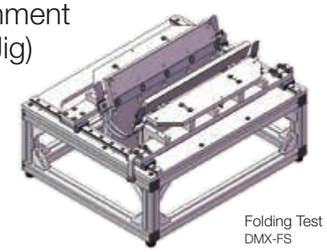
Sample / Jig Movement

Basic Movement



Set the sample flat on the tilt clamp. The equipment will repeat flat and bend motion. When bending, the tilt clamp moves downward so the sample would bend in natural U-shape. It is possible to perform vertical tests by setting the tilt clamp up right.

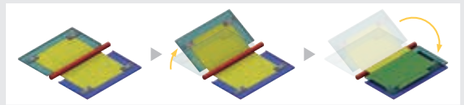
Attachment (Test Jig)

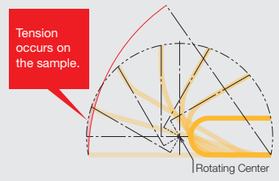


Folding Test Jig
DMX-FS

Issues During General Folding Test

When conducting tests with equipments shown in the below diagram, a large tension occurs on the sample when the test starts. The cause of this is clear when drawing a circle with radius the same length as the sample on the movement track of the test machine, shown on right. As shown in red in the diagram, the length of the sample is too short against the movement track of the clamp. If one uses a rod, this becomes more apparent. This causes the unexpected breaks and disperse in the test results in actual tests.





Tension free test

It is possible to fold without tension for planar objects like films and FPCs.

Ideal bending test

This machine can form ideal bending shapes by the elasticity of test pieces, or tiny one by guide plates. (patented)

Sample evaluation during test

It is possible to evaluate by microscope without take the sample from test machine by using cartridge attachment. The whole cartridge attachment with sample can remove from test jig. (patent pending)

Related tests or tests for reference https://www.yuasa-system.jp/en/

p. 10

Bending Test BTFB Type
test/y-btfb/

p. 18

Folding Test CS Type
test/y-cs/

p. 22

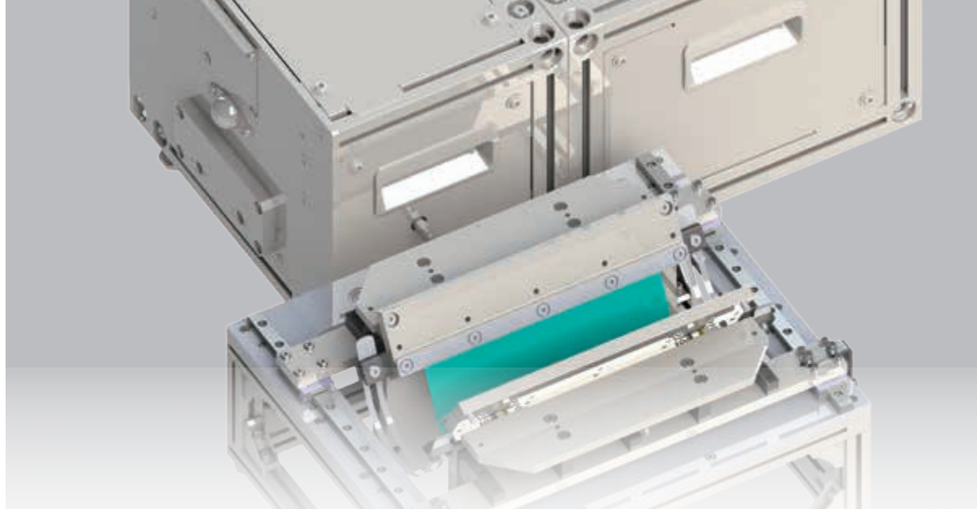
Sliding Test FU Type
test/y-fu/

p. 24

Sliding Test 4U Type
test/y-4u/

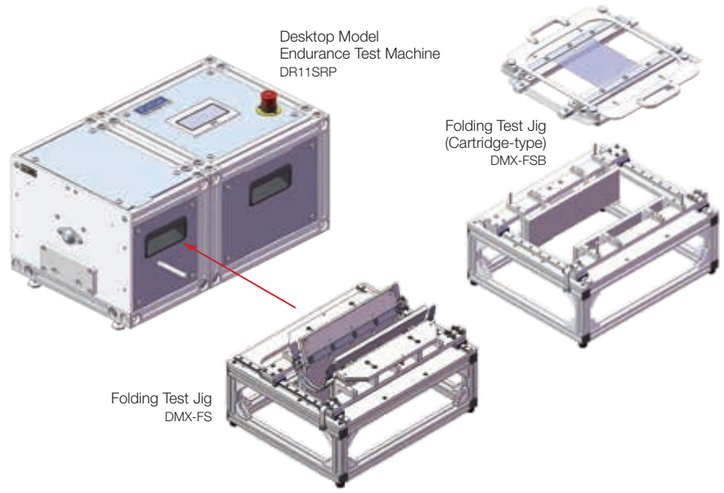
MODELS test/y-fs/

You can download the specification.

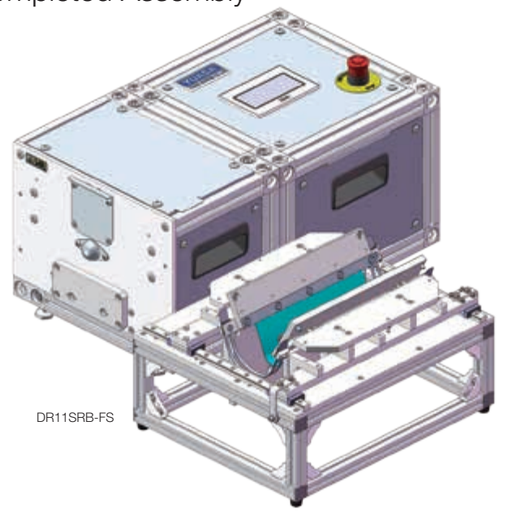


DR11SRB-FS

Composition



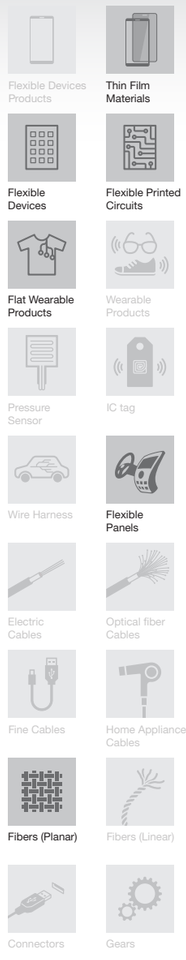
Drawing of Completed Assembly



DR11SRB-FS

FOLD

Example of Test Pieces



inquiry/

If you have any question, please ask us.

*Refer to p. 48 regarding the driving unit specification.

Y's Block
Endurance Test Machine

Folding Test CS Type

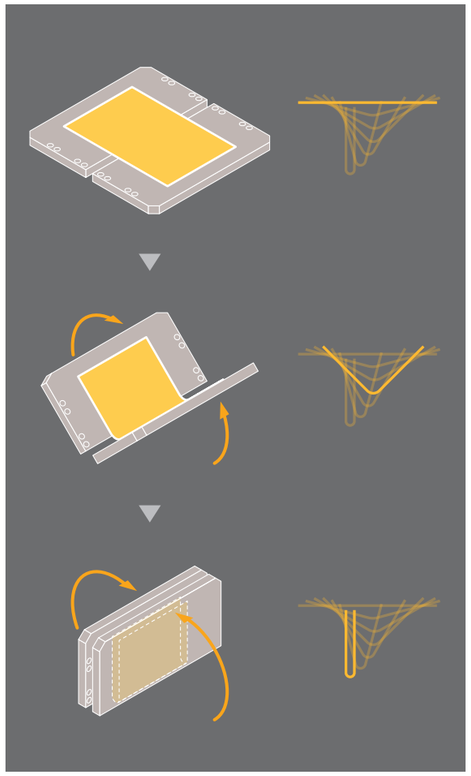
Tension Free™

Bending test with minimal bending R without tension load

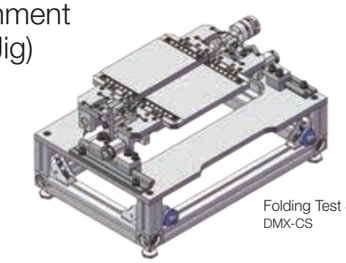
Type DR11SRP-CS
DR11MR-CS / CS-t / CS-m

This test machine can examine by tiny bending radius.
This test method doesn't occur the tensile stress to the test sample.

Sample / Jig Movement



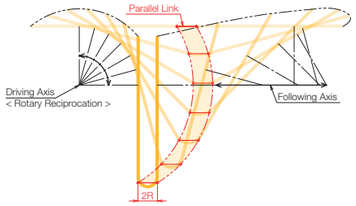
Attachment (Test Jig)



Folding Test Jig
DMX-CS

This test jig can realize the tiny bending radius test without tensile stress because test sample is kept by the 2 plates of double-joint clamshell.

Sample-deformation process



Two plates keep the test sample, and then one plate operates by Rotary Reciprocation Axis. This two plates move open and close keeping each angle by the parallel link structure.

Deformation process focused on test sample shape

This test jig doesn't make the tensile stress occur to the test sample because rotary point at the edge of plate. If the rotary point is different position, the tensile stress or compression stress will occur to the test sample.

Removable cartridge

The sample attaching part is a removable cartridge, so the sample can be attached easily.

Folding Test Jig
Cartridge

Three types of jigs support simultaneous testing and various sample sizes

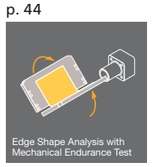
In addition to the standard CS jig, the twin type CS-t and the large type CS-m are available, enabling simultaneous testing of multiple samples and large samples.

Related tests or tests for reference https://www.yuasa-system.jp/en/

p. 20

test/y-cs-teardrop/

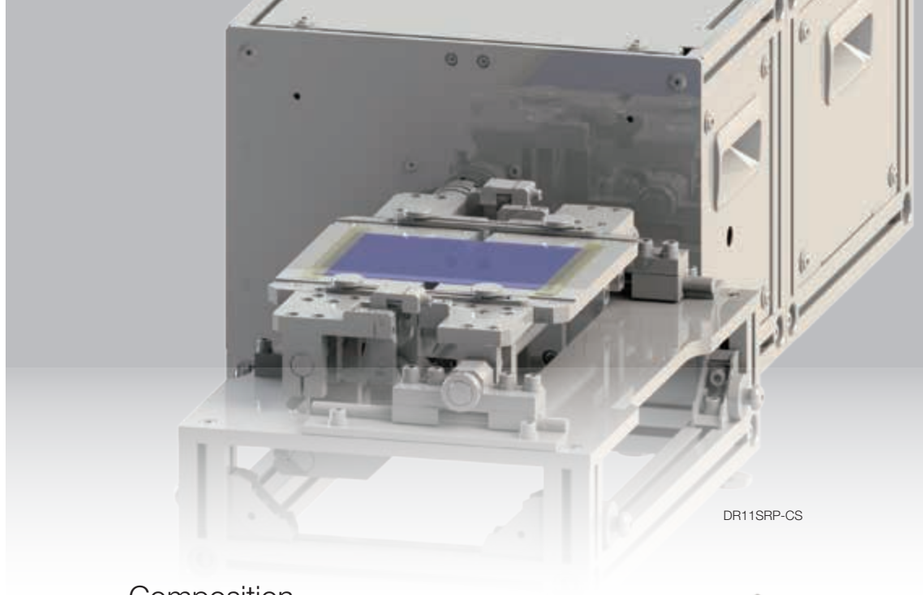
p. 44



test/y-cs-cam-esa/

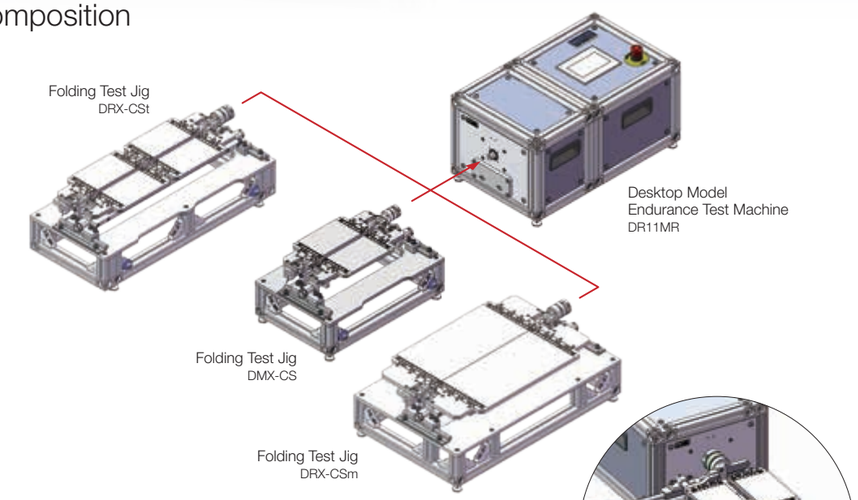
MODELS test/y-cs/

You can download the specification.

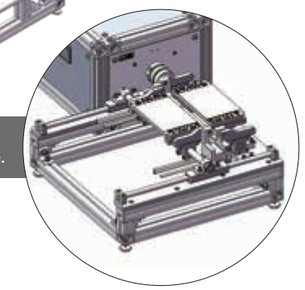


DR11SRP-CS

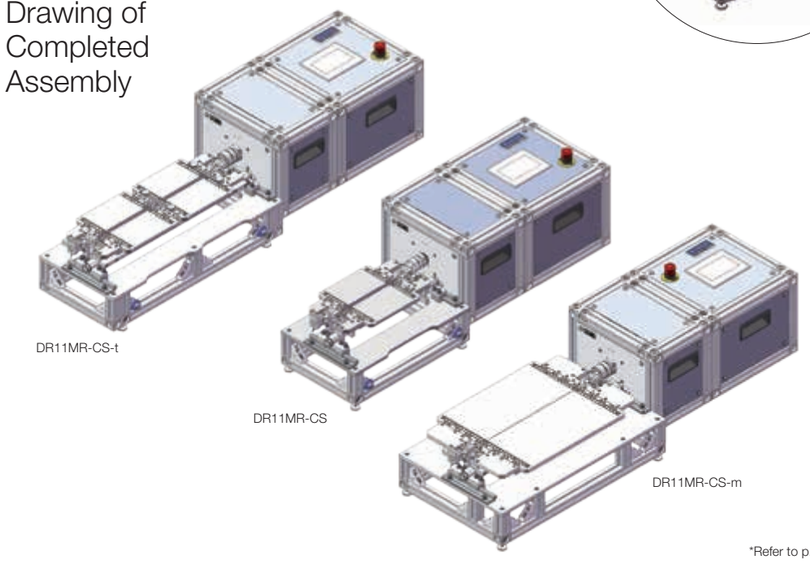
Composition



Special testing jig (DMX-CS-R75), which enables to set the bending R until 75mm by spreading the space between two testing plates, is also available.



Drawing of Completed Assembly



FOLD

Example of Test Pieces

- Flexible Devices Products
- Thin Film Materials
- Flexible Devices
- Flexible Printed Circuits
- Flat Wearable Products
- Wearable Products
- Pressure Sensor
- IC tag
- Wire Harness
- Flexible Panels
- Electric Cables
- Optical fiber Cables
- Fine Cables
- Home Appliance Cables
- Fibers (Planar)
- Fibers (Linear)
- Connectors
- Gears

inquiry/

If you have any question, please ask us.

*Refer to p. 48 regarding the driving unit specification.

Y's Block
Endurance Test Machine

Folding Test CS Type

Teardrop Controller

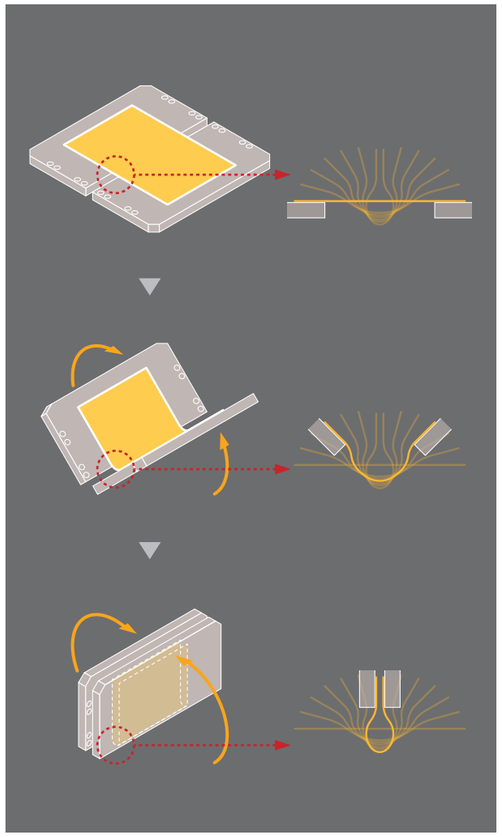
Tension Free™

Testing jig which can deform the sample to a teardrop shape

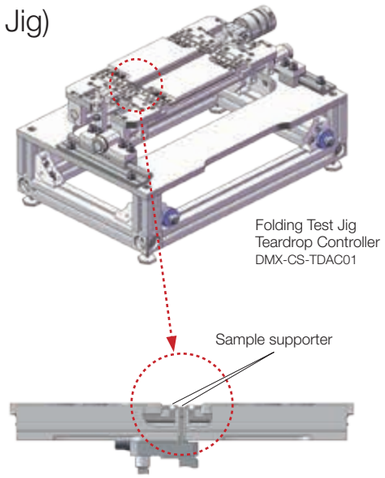
Type DMX-CS-TDAC01

Test to deform the sample into “Tear Drop” shape, by using optional jig on the test of Folding Test CS Type.

Sample / Jig Movement



Attachment (Test Jig)

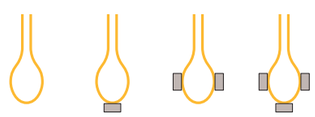


Sample shape deforming process

It is confirmed on many products that foldable displays are deformed into “Teardrop” shape when they are installed in actual products (Foldable Device). This optional jig “Teardrop Controller” enables the test under the condition near to the display used on actual product.

Control the Teardrop shape

Teardrop shape can be controlled by the sample supporter. Each supporter holds the sample at 4 different position and those combination, depending on the specification of final product.

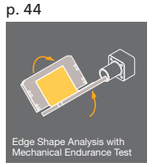


Related tests or tests for reference https://www.yuasa-system.jp/en/

p. 18

test/y-cs/

p. 44



test/y-cs-cam-esa/

test/y-cs-teardrop/

MODELS

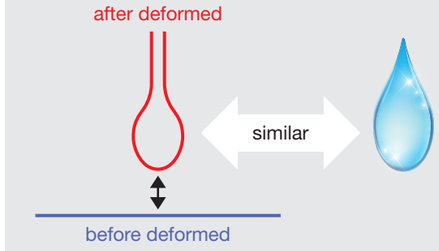
You can download the specification.

Teardrop shape can also be reproduced on Endurance test machine

By using Teardrop shape reproduction parts (optional), Endurance test which fits for non “U-shape”, nor “V-shape” end-device, become available on Clamshell type bending test machine.

What's the “Teardrop” shape?

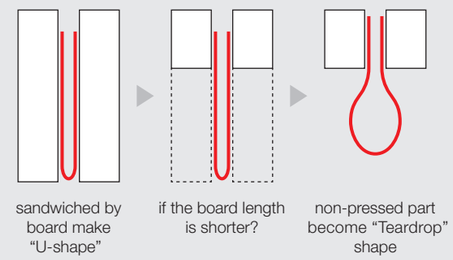
Inside of the tightly closed foldable smart phone, deformation load of display can be controlled.



Deformed shape looks like the shape of drop, so, this is called as “Teardrop shape”

How is the “Teardrop” shape made?

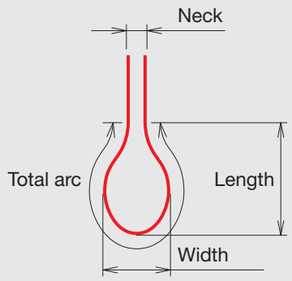
Basically, the “Teardrop” shape is made by “tension of test piece”, namely, by the “not want to be bent” nature of the piece.



Even by same test method, deformed shape is vary by nature of the test piece, such as its easy to bend inside, outside, or hard to bend.

In order to control “Teardrop” shape…

The shape of “Teardrop” become different by various factors.



4 major factors to determine the shape of “Teardrop”, there are “neck width”, “total arc length”, “teardrop width” and “teardrop length”. Teardrop width is equivalent to curvature diameter of standard “U-shape” bending. In case that the deformed part bend in sharp, the part can be protected by restricting (supporting) the teardrop length. However, the part to be the “Teardrop” shape is not held anywhere, so it can move freely and could deform easily, thus it is quite difficult to control its shape at will.

Even if "neck width" and "total arc length" are same, test piece can be different shape.

No supporter | 2 points supporting (width) | 3 points supporting (width and length)

inquiry/

If you have any question, please ask us.

Y's Block
Endurance Test Machine

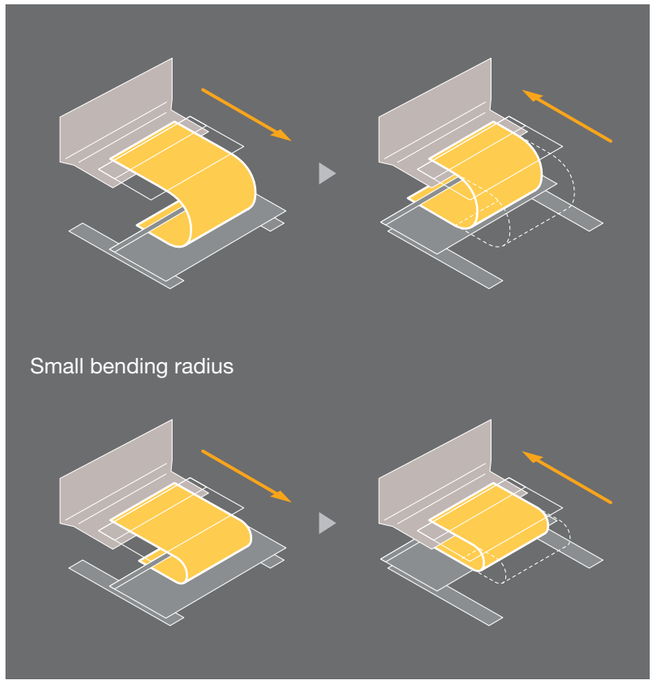
Sliding Test FU Type (1-lane)

U-Shape folding back test for Sheet type sample

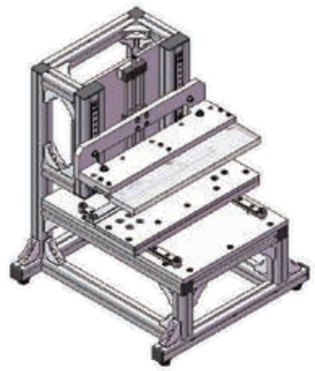
Type DR11SRB-FU / DR11SRP-FU

This machine realizes profitable tests for planar objects like flexible displays.

Sample / Jig Movement



Attachment (Test Jig)



Single-lane Test Jig
DMX-FU

Folding test pieces in U-shape to clamp, the output axis reciprocates the lower clamp back and forth.

Clamping to wider test pieces

A test piece from 215mm in width to 3mm in thickness is available to test. Under the same thickness, this machine also tests at a time the two or more objects whose total length is up to 215mm.

Free test conditions

This machine offer you a large variety of flexible tests in which you can select a fold radius between 0.5 - 5 - 80mm in the case of 0mm objects in thickness, a stroke between 0 - ±60mm, and a speed between 10 - 90r/min.

Visible test

By using a transparent holding plate, test pieces are checked easily.

Related tests or tests for reference https://www.yuasa-system.jp/en/

p. 16

test/y-fs/

p. 24

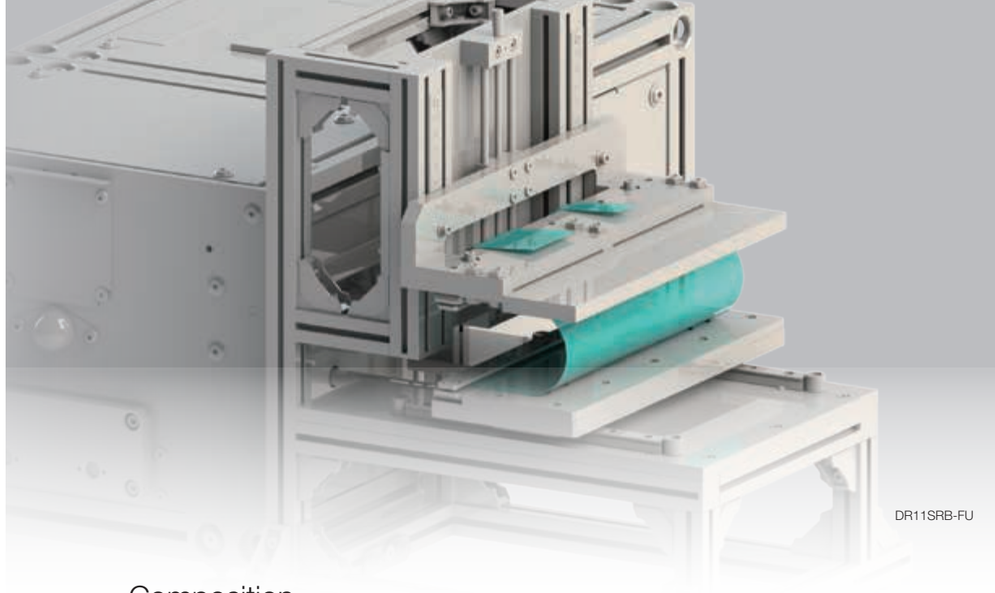
test/y-4u/

p. 36

test/y-l2u/

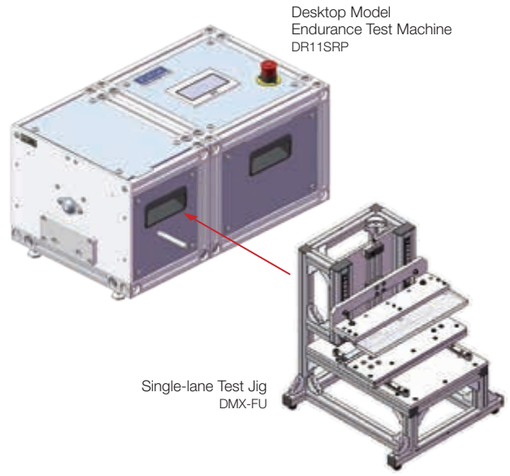
MODELS test/y-fu/

You can download the specification.



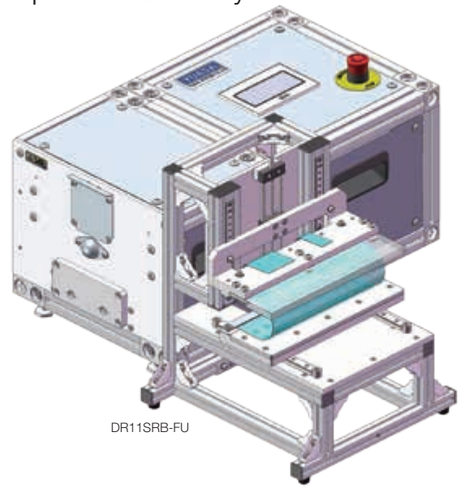
DR11SRB-FU

Composition



Single-lane Test Jig
DMX-FU

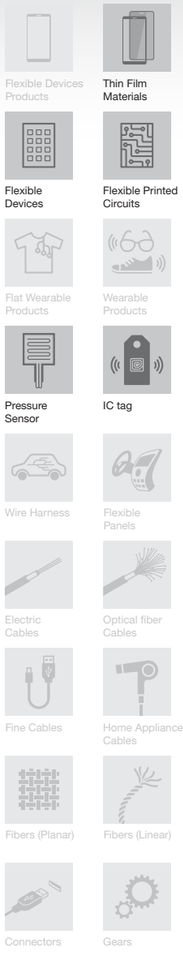
Drawing of Completed Assembly



DR11SRB-FU

SLIDE

Example of Test Pieces



inquiry/

If you have any question, please ask us.

Y's Block
Endurance Test Machine

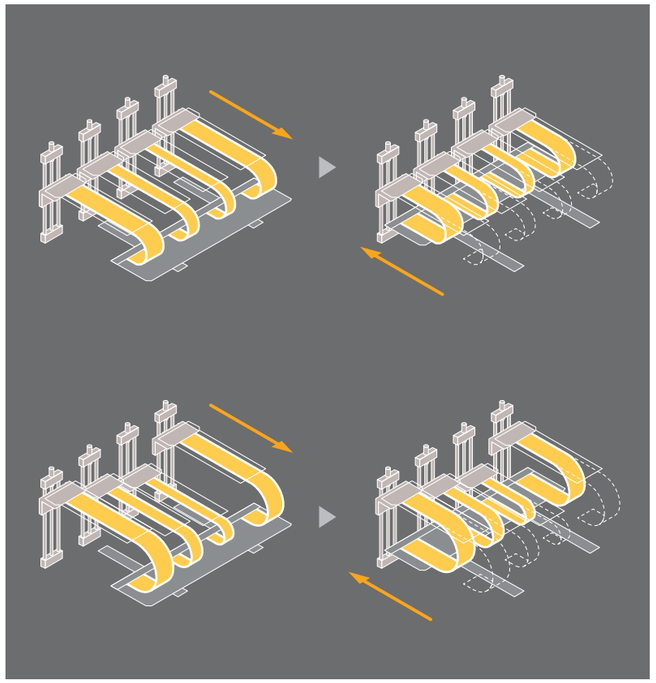
Sliding Test 4U Type (4-lane)

U-Shape folding back test for Linear or Sheet type sample

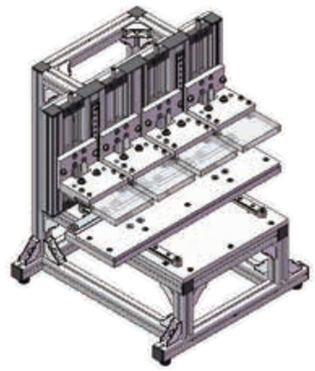
Type DR11SRB-4U / DR11SRP-4U

This machine offers profitable tests for linear objects like cables and fibers as well as planar ones such as flexible displays.

Sample / Jig Movement



Attachment (Test Jig)



4-lane Test Jig
DMX-4U

Folding test pieces in U-shape to clamp, the output axis reciprocates the lower clamp back and forth.

Four different test pieces for one trial

By using four lanes, you can conduct multiple tests as well as single test.

Free fold radii

Going up and down at the upper clamping positions, each lane makes various radii that you specify freely. A comparative trial is available on the same test pieces in different radii.

Related tests or tests for reference https://www.yuasa-system.jp/en/

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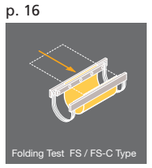


test/y-fs/

p. 22

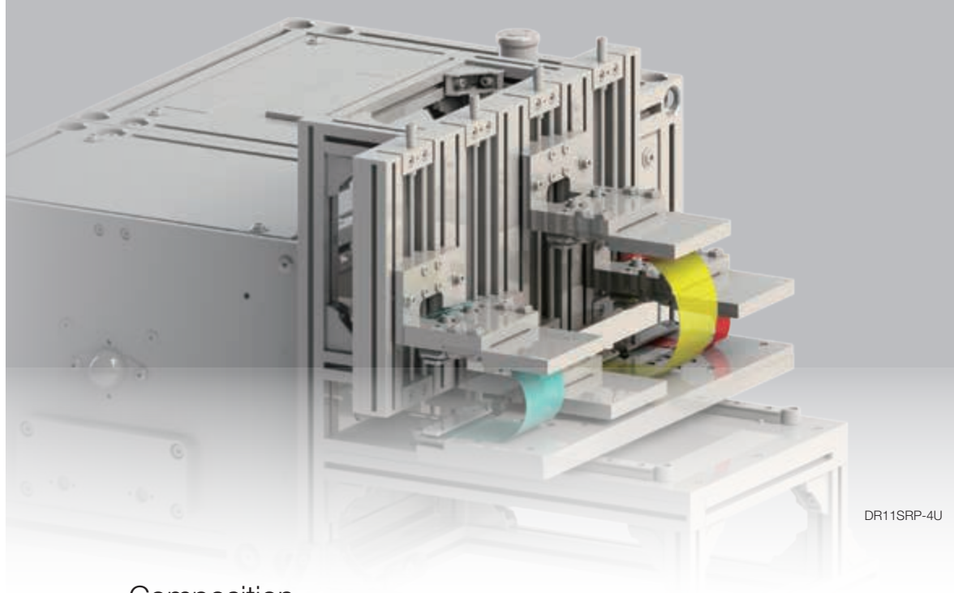
test/y-fu/

p. 36

test/y-l2u/

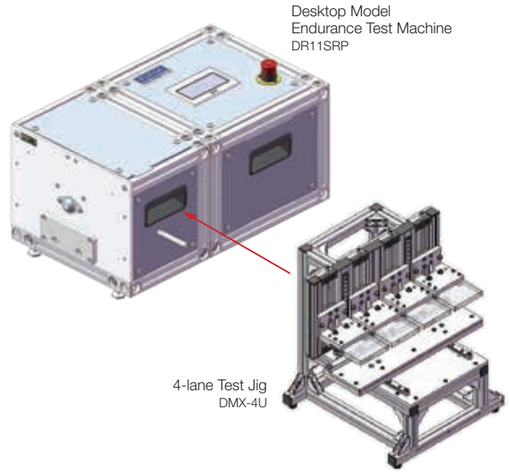
MODELS test/y-4u/

You can download the specification.

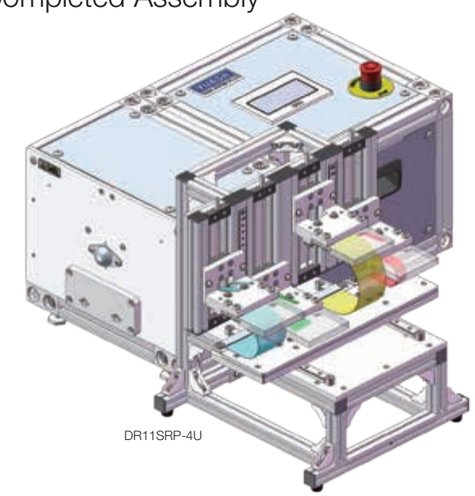


DR11SRP-4U

Composition



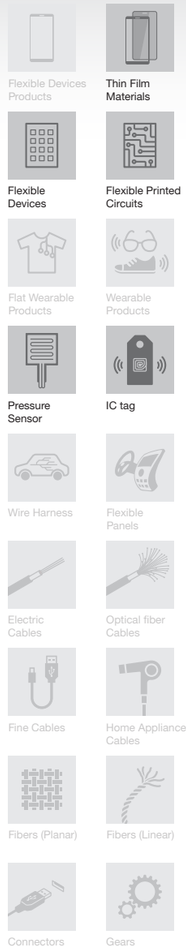
Drawing of Completed Assembly



DR11SRP-4U

SLIDE

Example of Test Pieces



inquiry/

If you have any question, please ask us.

*Refer to p. 48 regarding the driving unit specification.

Y's Block
Endurance Test Machine

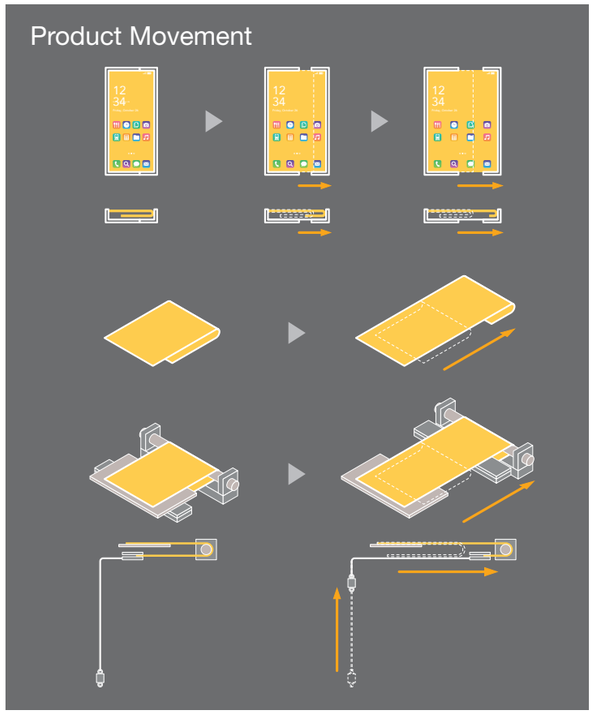
Sliding Test SU Type

U-Shape folding back test for the Sheet type sample such as sliding style smartphone display

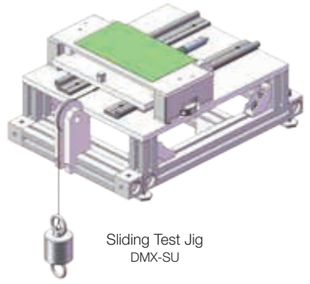
Type DR11SRB-SU / DR11SRP-SU

This machine can provide endurance tests for motion of planar objects like flexible display for slide type smartphones.

Sample / Jig Movement



Attachment (Test Jig)



Sliding Test Jig
DMX-SU

Folding test pieces to clamp in U-shape along the roller, and the roller reciprocates back and forth. Upper clamp is fixed, lower clamp follows the roller.

Load Cell (Optional)

Optional unit for measuring tension load. Tension load on test pieces can be measured directly by installing the load cell unit on jig side.

Combined motion with rolling and sliding

Assuming the Slide type smartphones' movement, testing with small amount of movement for rolling and sliding can be provided by this one attachment.

Measure a tension load on test pieces is also available

Tension load on test pieces can be measured by using the optional load cell unit.

Either of weights or springs can be used to apply tension

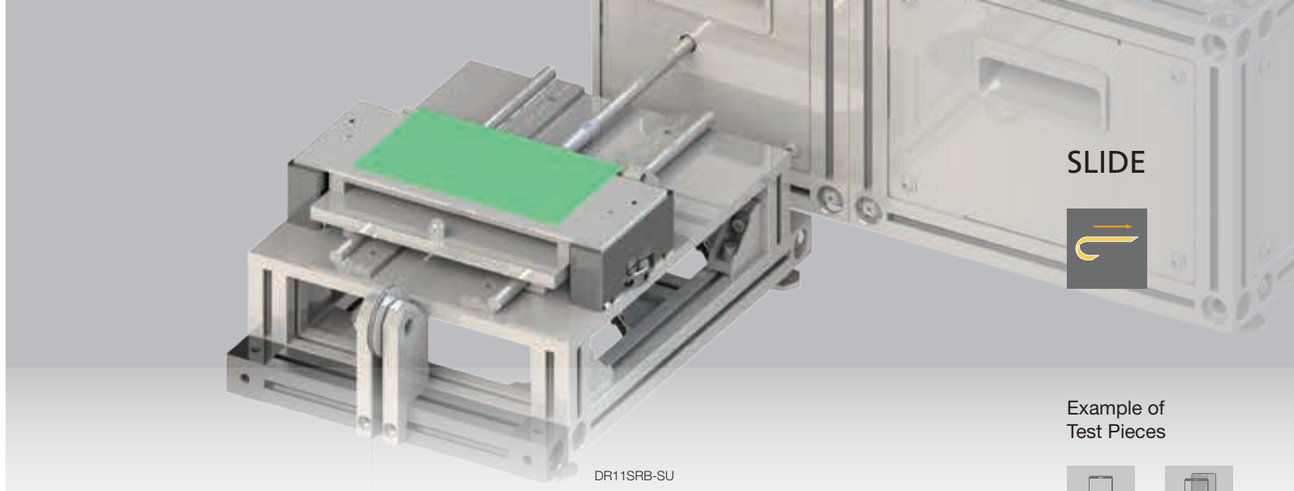
On illustration, "weights" are used to apply tension, however the "spring" can also be used. When applying the tension by springs, tension load can be applied along the motion of test pieces.

Related tests or tests for reference https://www.yuasa-system.jp/en/

p. 16 Folding Test FS / FS-C Type — test/y-fs/
p. 22 Sliding Test FU Type — test/y-fu/
p. 24 Sliding Test 4U Type — test/y-4u/
p. 36 Sliding Test LU Type — test/y-l2u/

MODELS test/y-su/

You can download the specification.



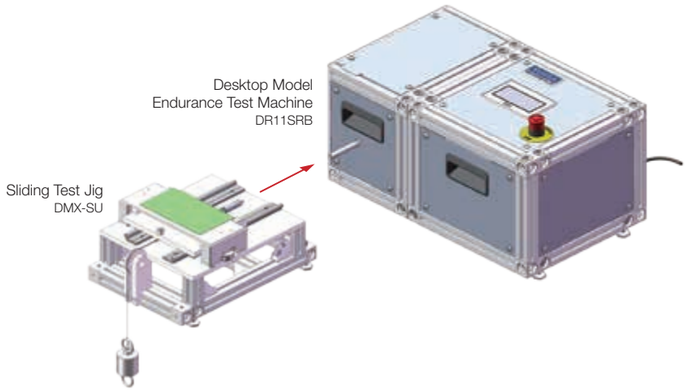
DR11SRB-SU

SLIDE

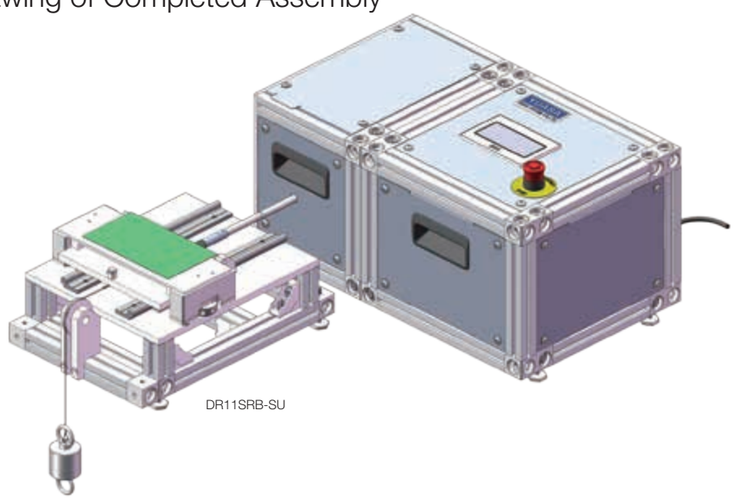
Example of Test Pieces

- Flexible Devices Products
- Thin Film Materials
- Flexible Devices
- Flexible Printed Circuits
- Flat Wearable Products
- Wearable Products
- Pressure Sensor
- IC tag
- Wire Harness
- Flexible Panels
- Electric Cables
- Optical fiber Cables
- Fine Cables
- Home Appliance Cables
- Fibers (Planar)
- Fibers (Linear)
- Connectors
- Gears

Composition



Drawing of Completed Assembly



DR11SRB-SU

inquiry/

If you have any question, please ask us.

*Refer to p. 48 regarding the driving unit specification.

Y's Block
Endurance Test Machine

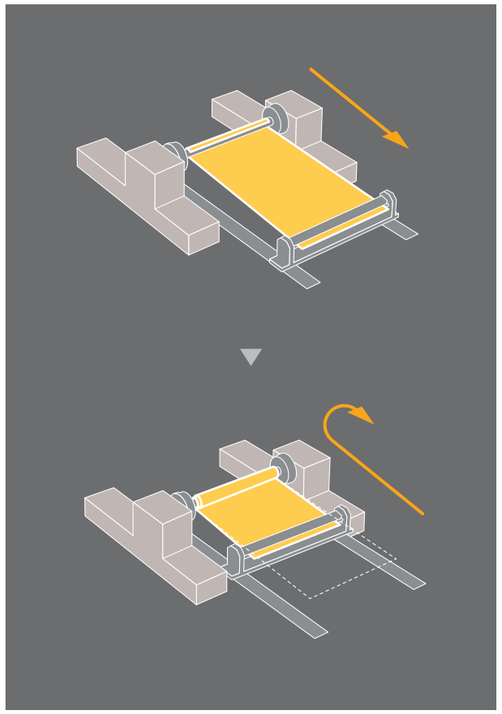
Rolling Test FR Type

Test of rewinding motion to the roller

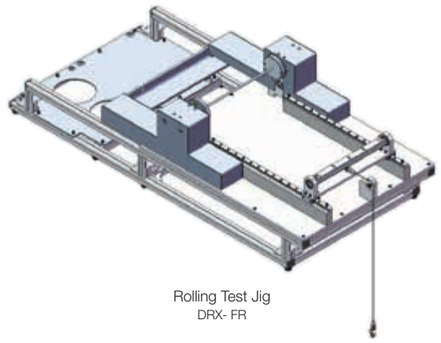
Type DR11SRB-FR / DR11SRP-FR

Using an object such as flexible displays, as well as cables and fibers, your original “Roll to Roll (R2R)” tests can be conducted.

Sample / Jig Movement



Attachment (Test Jig)



Rolling Test Jig
DRX- FR

The rack and pinion actuator system repeatedly rolls up and unrolls a test piece by rotating and reversing a roller.

Specify roller sizes from ø5 - ø100mm.

ø5 (min.) ø20 ø50 ø100 (max.)

Flexible setting for rolling up

This machine rolls up a test piece at both normal rotation and reverse rotation. Additionally, you can freely change the roll-up capacity by adjusting the operation stroke.

The Tilt Clamp as an excellent holding

The driven clamp flexibly moves along with the vertical movements of a test piece to reduce damages from the clamping part.

Related tests or tests for reference https://www.yuasa-system.jp/en/

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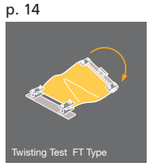


test/y-ft/

p. 30

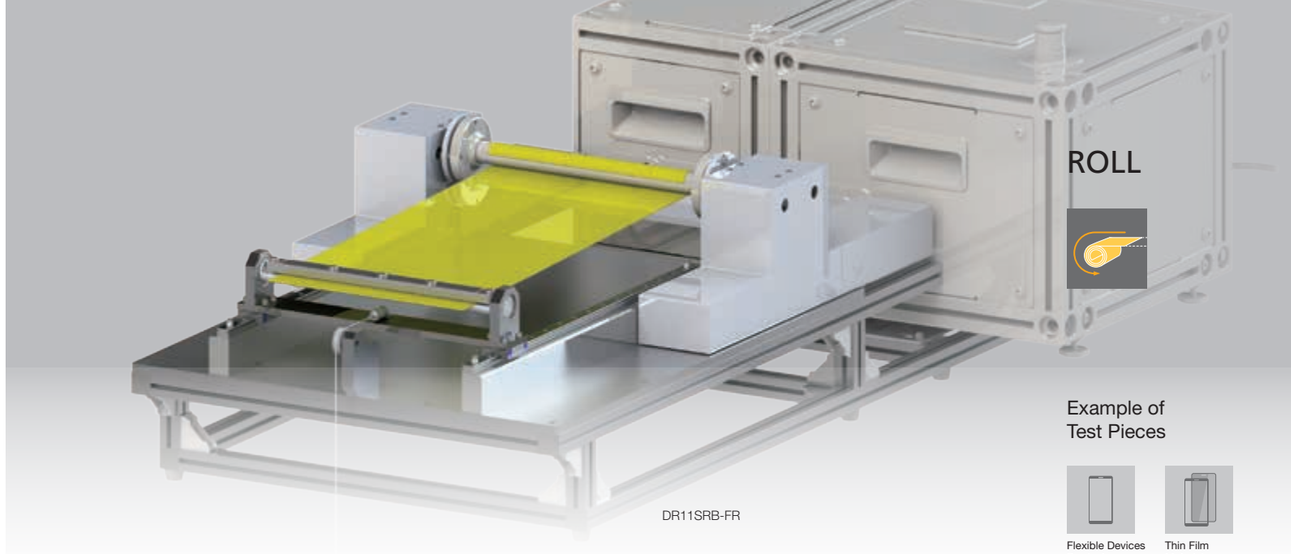
test/y-fr/

p. 34

test/y-st/

MODELS test/y-sfr/

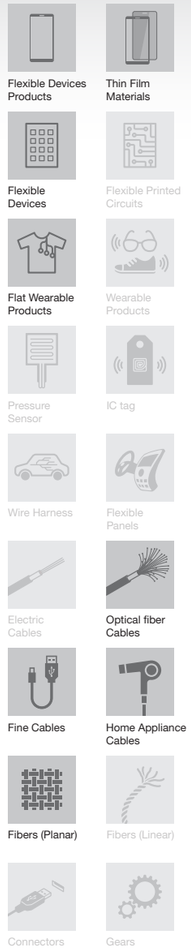
You can download the specification.



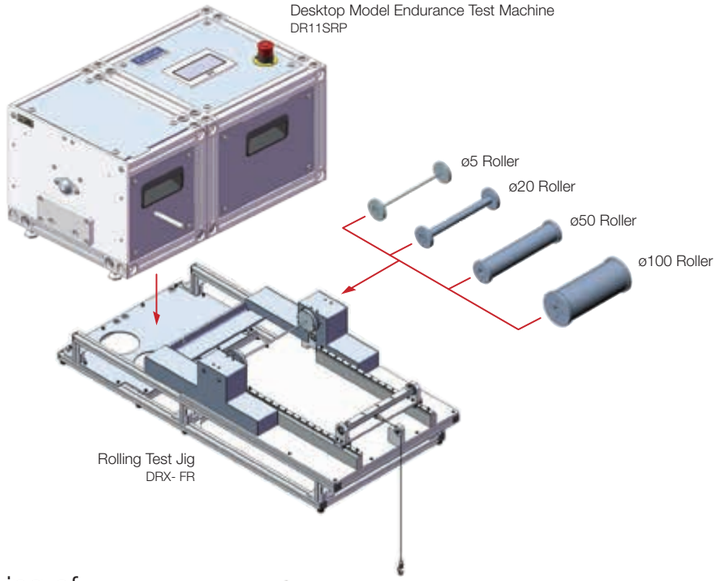
DR11SRB-FR

ROLL

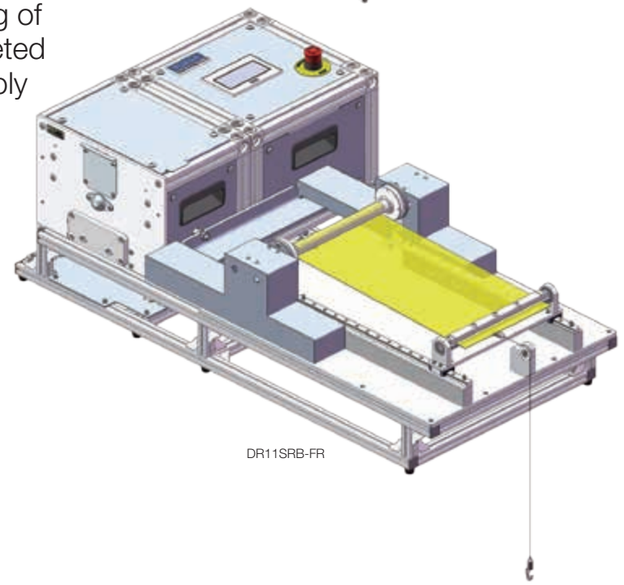
Example of Test Pieces



Composition



Drawing of Completed Assembly



DR11SRB-FR

inquiry/

If you have any question, please ask us.

*Refer to p. 48 regarding the driving unit specification.

Y's Block
Endurance Test Machine

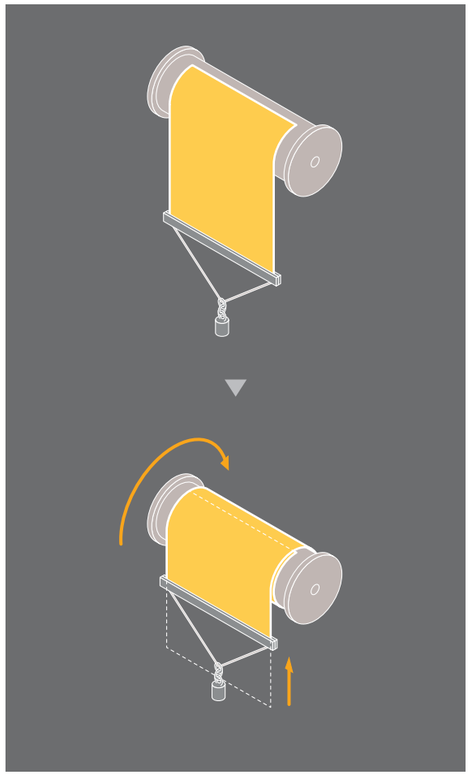
Rolling Test FR Type

Test of rewinding motion to the roller

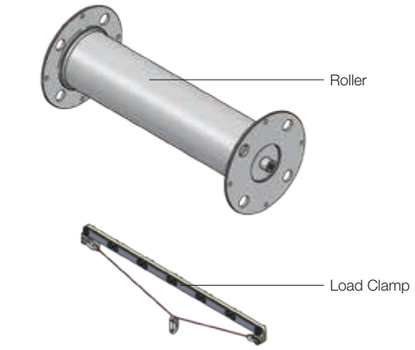
Type DR11MR-FR

Endurance test of roll-up movement for sheet type sample such as flexible devices, cables or fabrics, etc., can be applicable.

Sample / Jig Movement



Attachment (Test Jig)



Rolling Test Jig
DRX-FR

Sample is rolled-up / released by rotate Roll-up roller in positive and negative direction.
Size of roll-up roller can be designated in range between ø10 - ø160mm

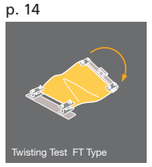
Sample can be rolled-up whichever from the left side or the right side

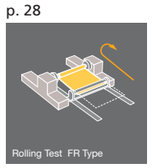
Sample can be rolled-up whichever from the left side towards roll-up roller, or from the right side. And the rolling-up amount can also be set arbitrarily.

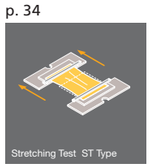
Sample mounting with reducing deflection

It is designed to reduce deflection by mounting sample in vertical direction. Straight rolling-up is enabled by the layout of sample mounting position and loading cramp in linear vertical direction.

Related tests or tests for reference https://www.yuasa-system.jp/en/

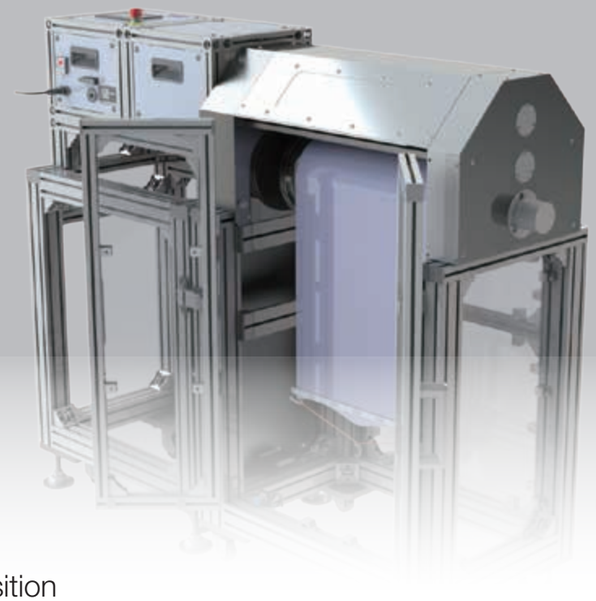
p. 14

Twisting Test FT Type
test/y-ft/

p. 28

Rolling Test FR Type
test/y-sfr/

p. 34

Stretching Test ST Type
test/y-st/

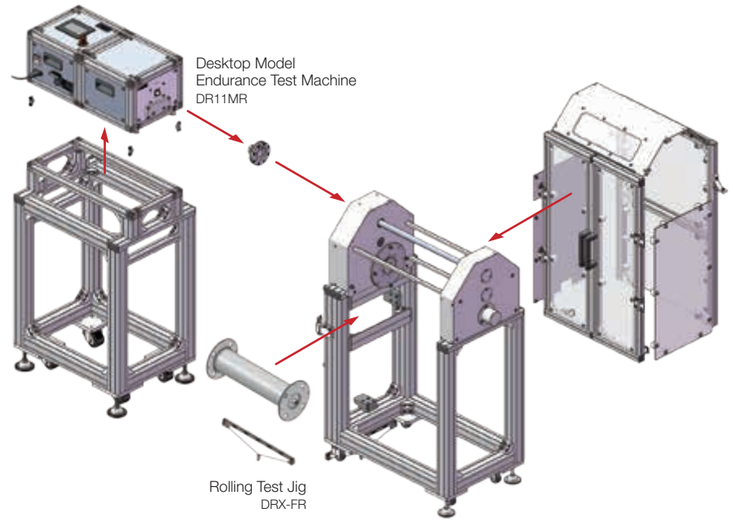
MODELS test/y-fr/

You can download the specification.



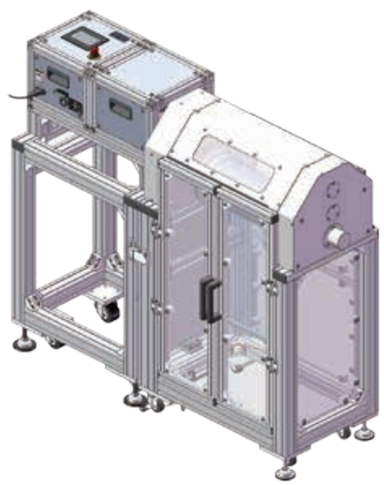
DR11MR-FR

Composition



Rolling Test Jig
DRX-FR

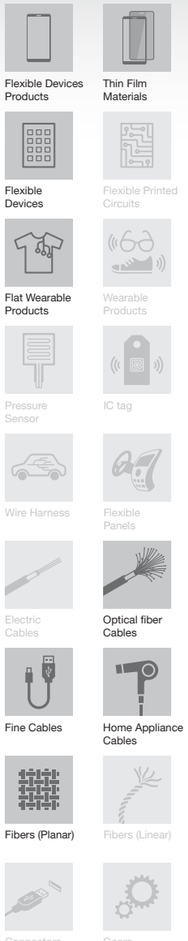
Drawing of Completed Assembly



DR11MR-FR

ROLL

Example of Test Pieces



inquiry/

If you have any question, please ask us.

*Refer to p. 48 regarding the driving unit specification.

Y's Block
Endurance Test Machine

Pushing / Pulling Test PP Type

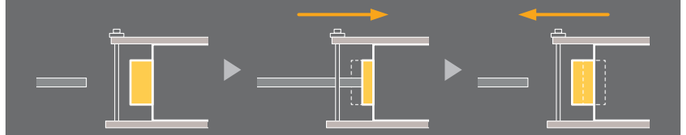
Test of Pushing to Insert / Pulling to Remove motion for various products

Type DR11SRB-PP / DR11SRP-PP

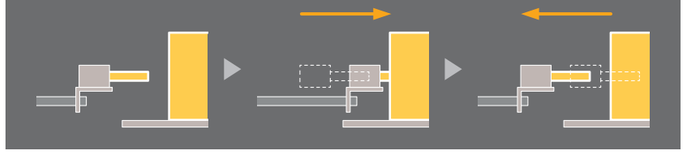
For switches, SD cards, and USB memories used in many industrial applications, this machine offers endurance tests of pushing and/or pulling.

Sample / Jig Movement

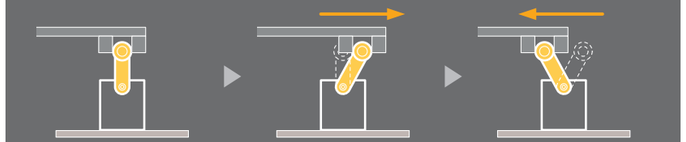
Pushing Test for Push-button Switch
A proper jig is attached to the output axis to push a tested switch.



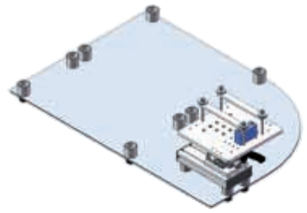
Inserting and Ejecting Test for Storage Media
A proper jig is attached to the output axis to hold a tested media.



Operating Test for Limit Switch
A proper jig is attached to the output axis to operate a tested switch.



Attachment (Test Jig)



Pushing / Pulling Test Jig
DRX-PP

The output axis reciprocally pushes and pulls a test piece fixed on the XYZ table for testing its endurance. Please feel free to consult us about additional jigs attached to the output axis.

Smoothly linear reciprocating motion

The linkable structure(DMLHB-PP) featuring a more smooth and stable operation continues to test with no damage to a test piece.

Using the XYZ table

The positioning of test pieces is so easy. This machine is designed for testing a wide variety of products. Even your prototype products can be tested.

Flexible change of strokes

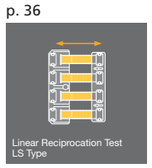
In the main unit, it is possible to freely set up a stroke and effectively perform to test.
Ex. (Push-button switch → Short stroke, Limit switch → Long stroke)

Related tests or tests for reference https://www.yuasa-system.jp/en/

p. 34

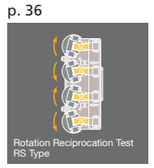
test/y-st/

p. 36



test/y-l4s/

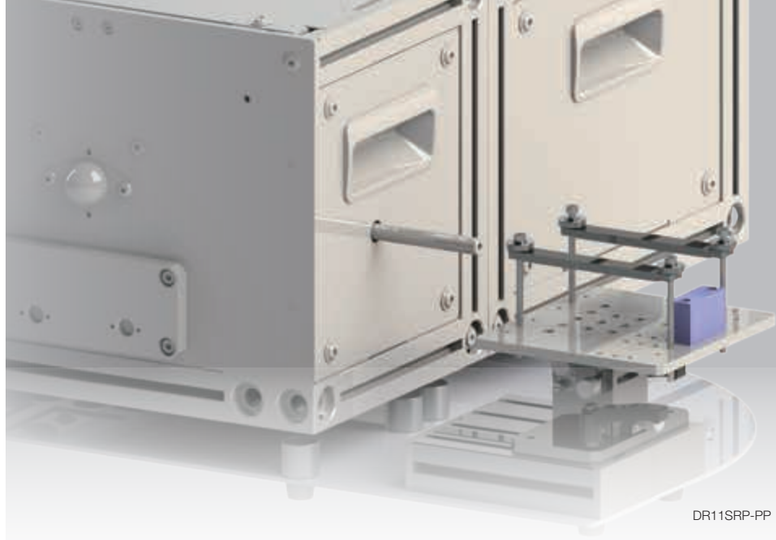
p. 36



test/y-r4s/

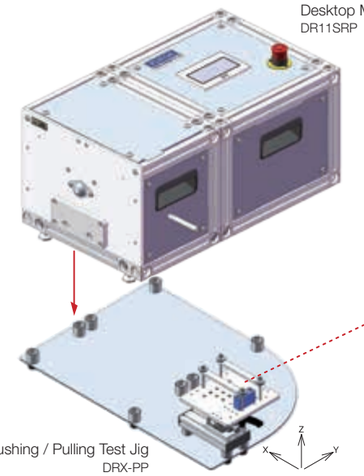
MODELS test/y-pp/

You can download the specification.



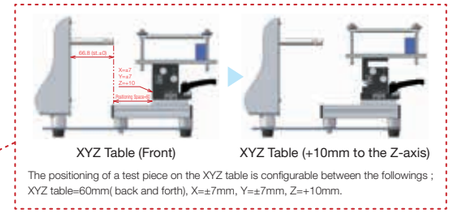
DR11SRP-PP

Composition



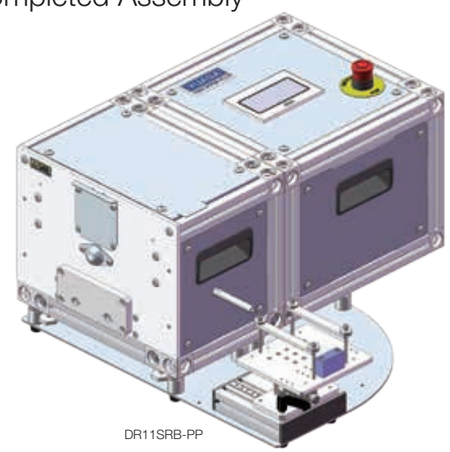
Desktop Model Endurance Test Machine
DR11SRP

Pushing / Pulling Test Jig
DRX-PP



The positioning of a test piece on the XYZ table is configurable between the followings ; XYZ table=60mm(back and forth), X=±7mm, Y=±7mm, Z=+10mm.

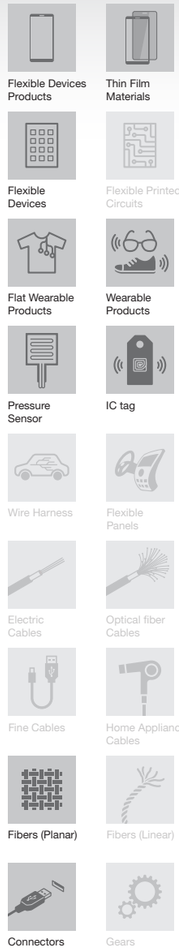
Drawing of Completed Assembly



DR11SRB-PP

PUSHPULL

Example of Test Pieces



inquiry/

If you have any question, please ask us.

*Refer to p. 48 regarding the driving unit specification.

Y's Block
Endurance Test Machine

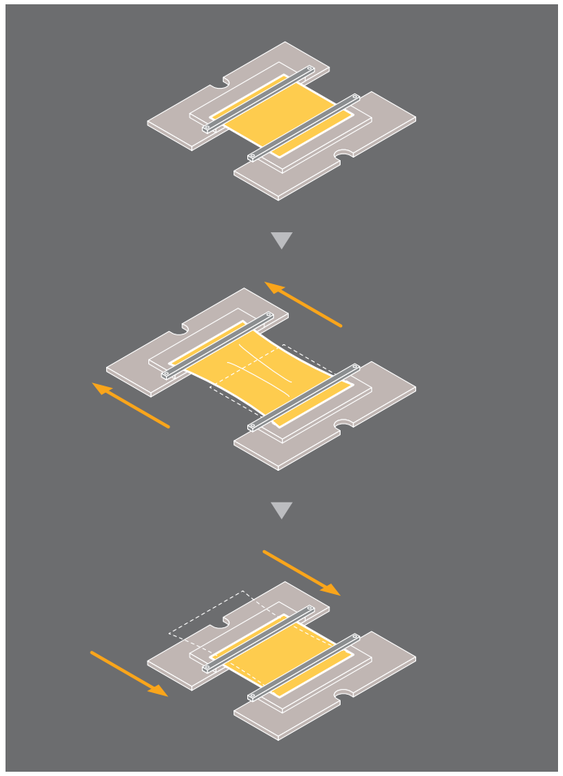
Stretching Test ST Type

Pulling test for elastic samples

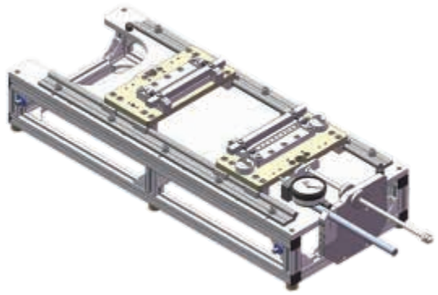
Type DR11SRP-ST

This is the best test method to evaluate the stretching test sample such a wearable devices or flexible devices.

Sample / Jig Movement



Attachment (Test Jig)



Stretching Test Jig
DRX-ST

Clamp the test sample horizontally, and it makes tensile stress occur repeatedly by operating the slider of driving unit.

Best test method for stretchable materials

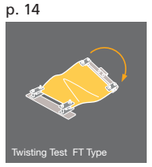
It is possible to evaluate the stretching test sample such a wearable devices or flexible devices.

A variety of test condition

The stroke is maximum 120mm, e.g. the test sample which length is 30mm can be extended up to maximum 150mm.

Related tests or tests for reference https://www.yuasa-system.jp/en/

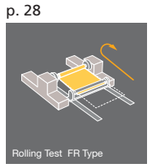
p. 14



Twisting Test FT Type

test/y-ft/

p. 28



Rolling Test FR Type

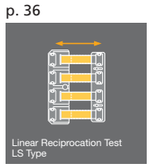
test/y-sfr/

p. 30

Rolling Test FR Type

test/y-fr/

p. 36

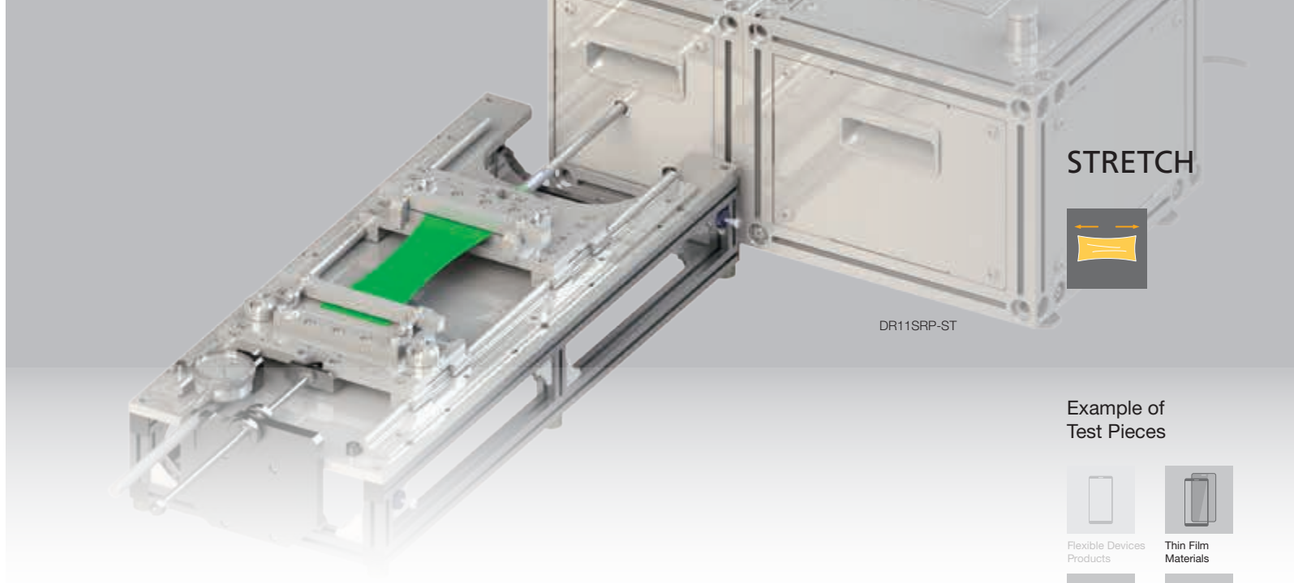


Linear Reciprocation Test LS Type

test/y-l4s/

MODELS test/y-st/

You can download the specification.

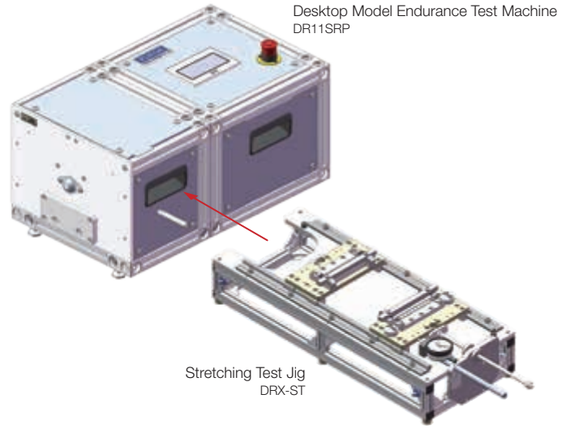


DR11SRP-ST

STRETCH

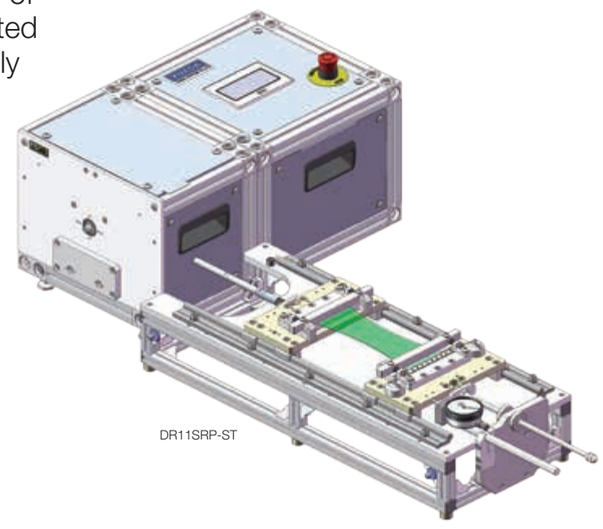
Composition

Desktop Model Endurance Test Machine
DR11SRP



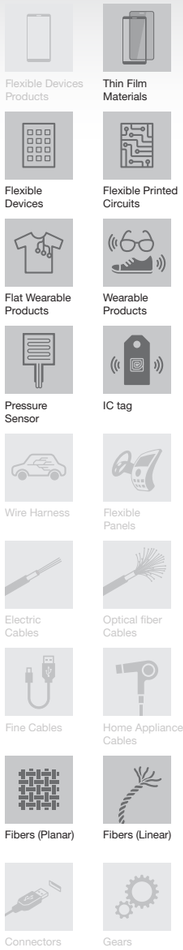
Stretching Test Jig
DRX-ST

Drawing of Completed Assembly



DR11SRP-ST

Example of Test Pieces



inquiry/

If you have any question, please ask us.

*Refer to p. 48 regarding the driving unit specification.

Y's Block
Endurance Test Machine

Linear Reciprocation Test LS Type / Rotation Reciprocation Test RS Type / Sliding Test LU Type

Various type of endurance tests for FPC board, etc.

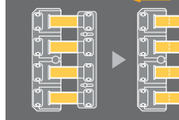
Type DR11MR3-L4S (Linear Reciprocation Test) / R4S (Rotation Reciprocation Test) / L2U (Sliding Test)

This machine can provide endurance test for motion of stretching, twisting, and sliding for FPC by change test jigs.

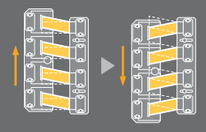
Sample / Jig Movement

Linear Reciprocation Test

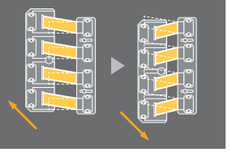
Vertical Movement



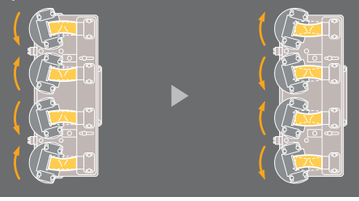
Horizontal Movement



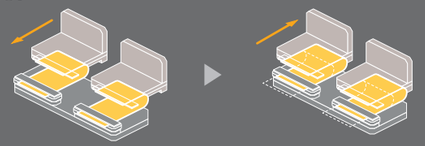
Diagonal Movement



Rotation Reciprocation Test



Sliding Test



Horizontal movement / diagonal movement are also available. Bending radius of each lanes can be set freely.

Attachment (Test Jig)

Linear Reciprocation Cartridge

This jig that repeatedly performs linear reciprocating motion to attached samples such as FPC board.

Rotary Reciprocation Cartridge

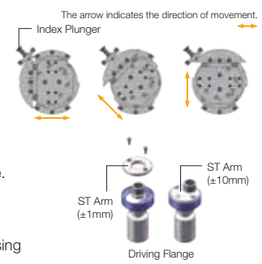
This jig that repeatedly performs rotation reciprocating motion to attached samples such as FPC board. This jig can perform a test that applies a load in the rotational direction, which is not possible with a linear reciprocating cartridge.

Sliding Cartridge

Cramp the sheet sample bent in U-shape, and apply linear reciprocating motion only for the lower cramp.

Multiple movement applicable by rotary slide table

By rotating the rotary slide table along with the movement direction angle, 3 directions, vertical, horizontal and diagonal movement tests are available. Setting can easily be changed, since rotary slide table is fixed by pin.(index plunger)
*It is possible to customize the slide table of other direction.



Set accurate reciprocation distance with cam mechanism

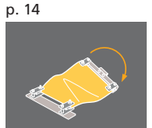
Accurate stroke is provided by exchanging the plate (ST-Arm) in the driving flange according to the reciprocating distance.

Test time saving by test four samples simultaneously

It is possible to shorten the test time by test not only single samples but also different types of samples simultaneously using four lanes freely.

Related tests or tests for reference https://www.yuasa-system.jp/en/

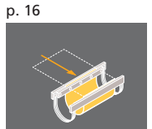
p. 14



Twisting Test FT Type

test/y-ft/

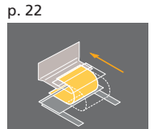
p. 16



Folding Test FS / FS-C Type

test/y-fs/

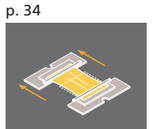
p. 22



Sliding Test FU Type

test/y-fu/

p. 34



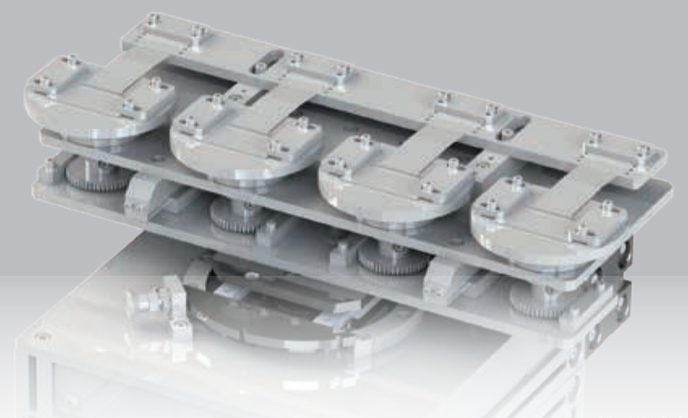
Stretching Test ST Type

test/y-st/

MODELS

test/y-l4s/ test/y-r4s/ test/y-l2u/

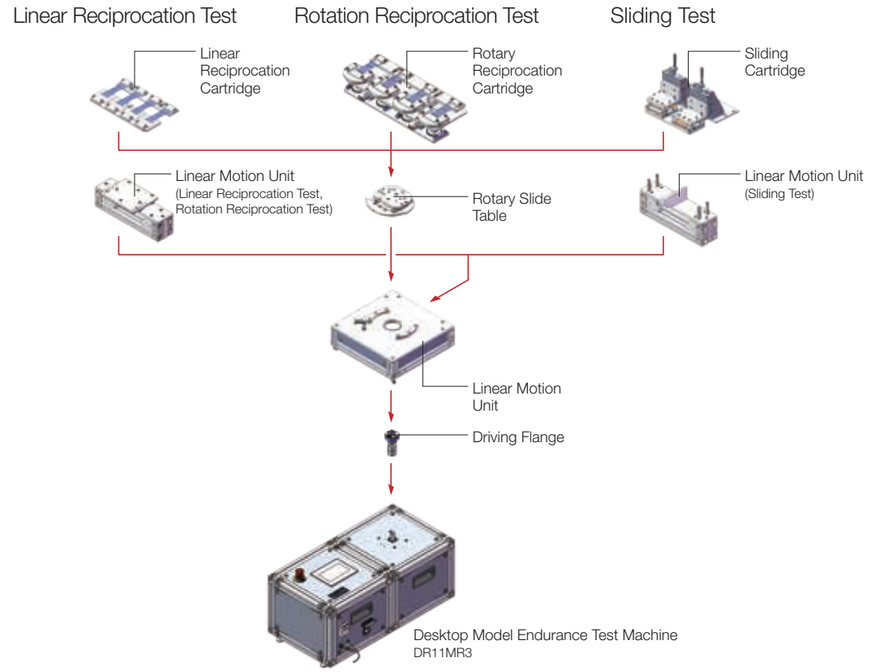
You can download the specification.



DR11MR3-R4S

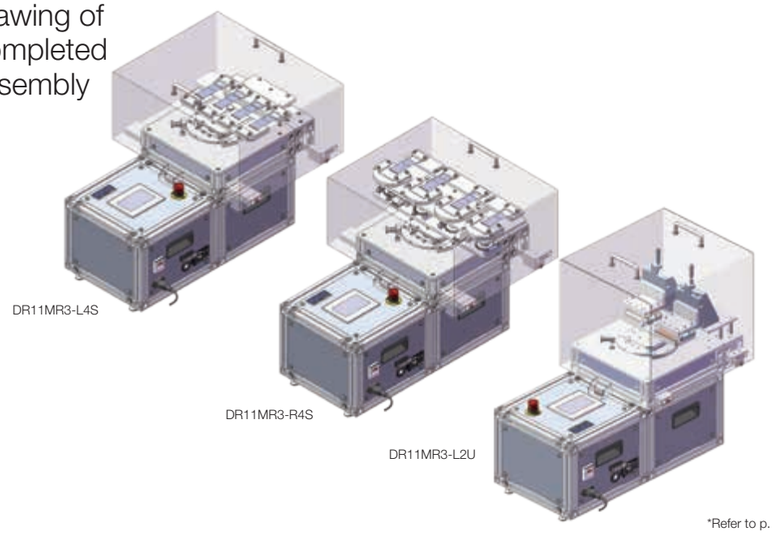
STRETCH SLIDE

Composition



Desktop Model Endurance Test Machine
DR11MR3

Drawing of Completed Assembly

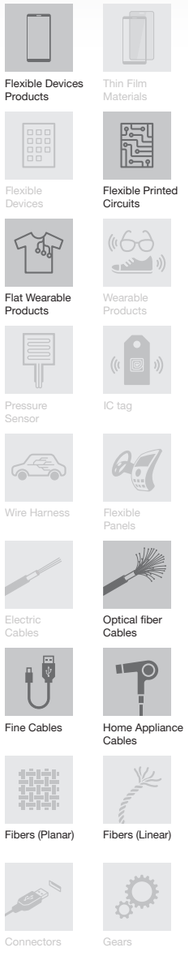


DR11MR3-L4S

DR11MR3-R4S

DR11MR3-L2U

Example of Test Pieces



inquiry/

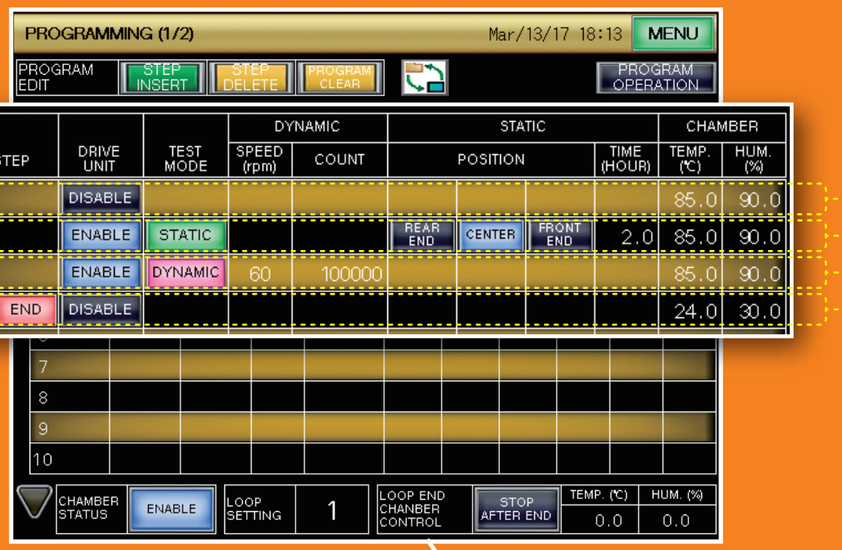
If you have any question, please ask us.

*Refer to p. 48 regarding the driving unit specification.

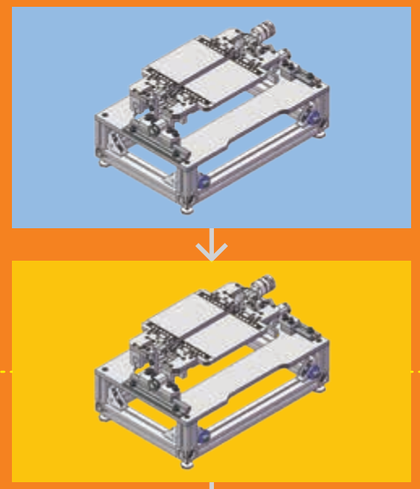
Environment and Movement Interlocking Type Endurance Test System

Endurance Test × Environmental Test → Programed Operation

Environment and Movement Interlocking Type Endurance Test System Which Realizes
Various Endurance Tests In Constant Temperature and Humidity Environment.

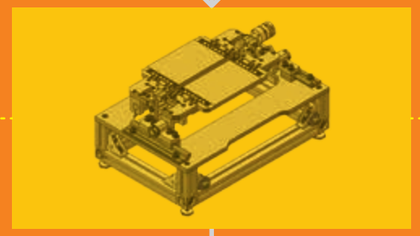


Example Using Program Operation
(Folding Test Jig)



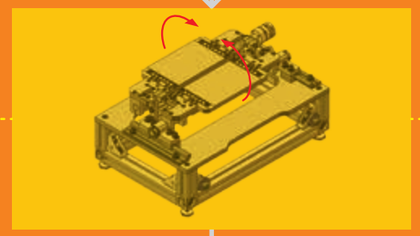
STEP 1

Set thermo-hygrostat to 85°C/90%Rh.



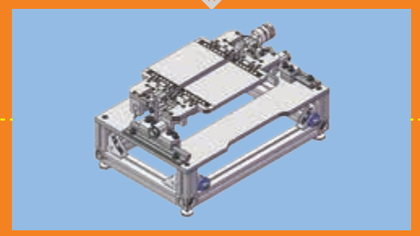
STEP 2

Wait 2 hours maintaining thermo-hygrostat at 85°C/90%Rh.



STEP 3

Conduct the test 100,000 times with thermo-hygrostat set at 60 rounds/minute.



STEP 4

Adjust the thermo-hygrostat to room temperature (24°C/30%Rh) and finish the operation.

Y's Block
Endurance Test Machine

Constant Temperature and Humidity Environment Endurance Test Machine

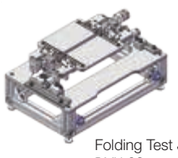
Tension Free™

Bending test under constant temperature and constant humidity

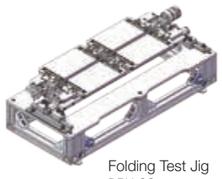
Type DR11MC-CET03A-CS / CS-t / CS-m

Environment-Endurance test which can set any humidity, any temperature, and any test movement by program.
Various Environment-Endurance tests can be implemented, such as Bending tests and others.

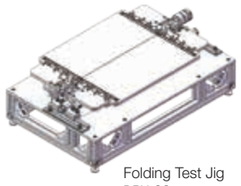
Attachment (Test Jig)



Folding Test Jig
DMX-CS



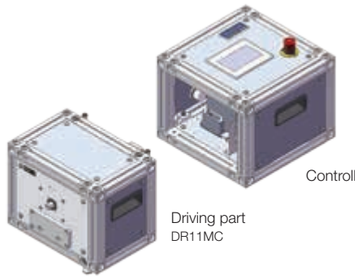
Folding Test Jig
DRX-CSt



Folding Test Jig
DRX-CSm

Driving Unit

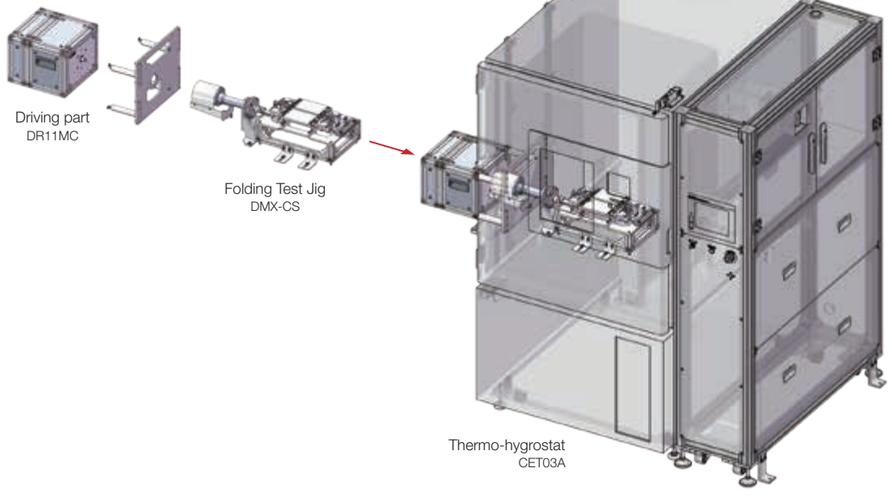
Desktop Model
Endurance Test Machine
DR11MR



Controller part

Driving part
DR11MC

Composition



Driving part
DR11MC

Folding Test Jig
DMX-CS

Thermo-hygrostat
CET03A

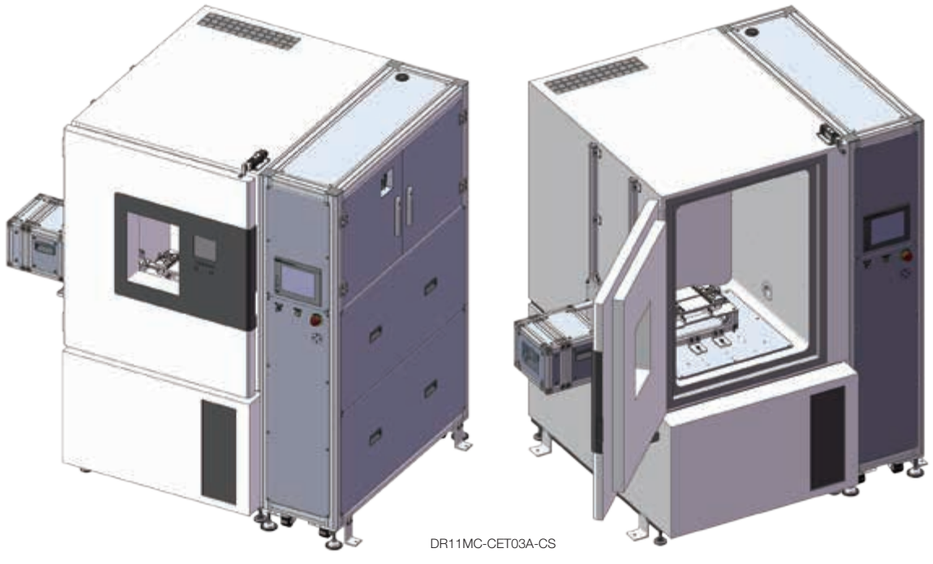
test/y-cs-cet03a/

MODELS

You can download the specification.

DR11MC-CET03A-CS

Drawing of Completed Assembly



DR11MC-CET03A-CS

This can be installed into existing constant temp. / humidity container. Please contact us for detail.

inquiry/

If you have any question, please ask us.

FOLD

Example of Test Pieces

- Flexible Devices Products
- Thin Film Materials
- Flexible Devices
- Flexible Printed Circuits
- Flat Wearable Products
- Wearable Products
- Pressure Sensor
- IC tag
- Wire Harness
- Flexible Panels
- Electric Cables
- Optical fiber Cables
- Fine Cables
- Home Appliance Cables
- Fibers (Planar)
- Fibers (Linear)
- Connectors
- Gears

*Refer to p. 48 regarding the driving unit specification.

Endurance Testing Systems Support Package

Image × **Y's Block** × Measuring → Analysis the sample deformation

Image

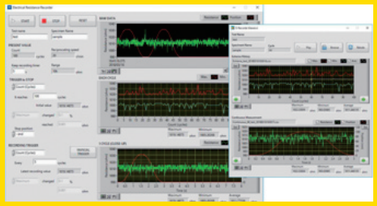
Edge Shape Analysis

Mechanoluminescence

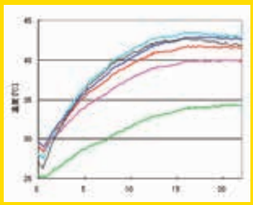
Failure detection

Measuring

Conductor resistance



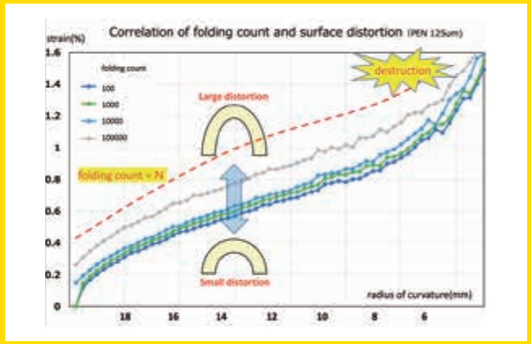
Temperature



Analysis

Visualization

Failure prediction



Failure sign

Y's Block
Endurance Test Machine

Edge Shape Analysis with Mechanical Endurance Test

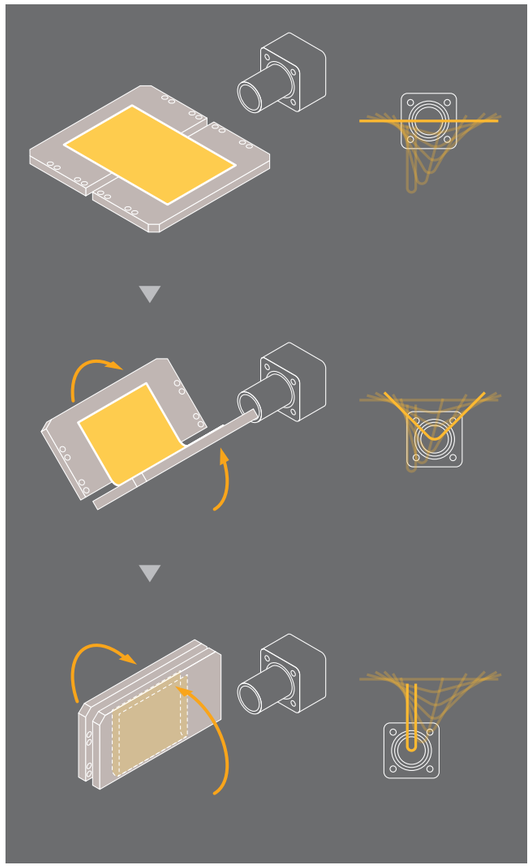
Tension Free™

Bending test equipped with function for analysis of Curved Shape of bent / folded sample

Type DR11MR-CS-cam-ESA

Sheet type sample's Curved Shape at the timing of its bent / folded, can be analyzed by pictures of the on testing jig camera, which is set to shoot in conjunction with sample movement.

Sample / Jig Movement

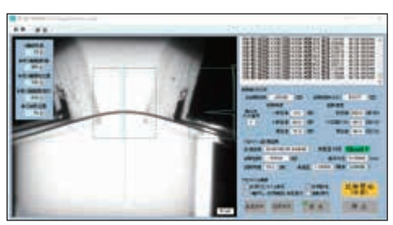


Attachment (Test Jig)

The camera follows movement of test sample by the control structure of camera position. That gives steady image of test sample to evaluate mechanical deformation.

Edge Shape Analysis during deformation using side-view Failure prediction by deformation profiling

Image processing system developed by Shishido Lab. @TITECH tells precise edge shape on specimen while deformation occurred, by using specific optics. It can predict the failure by deformation profiling.



test/y-cs-cam-esa/

MODELS

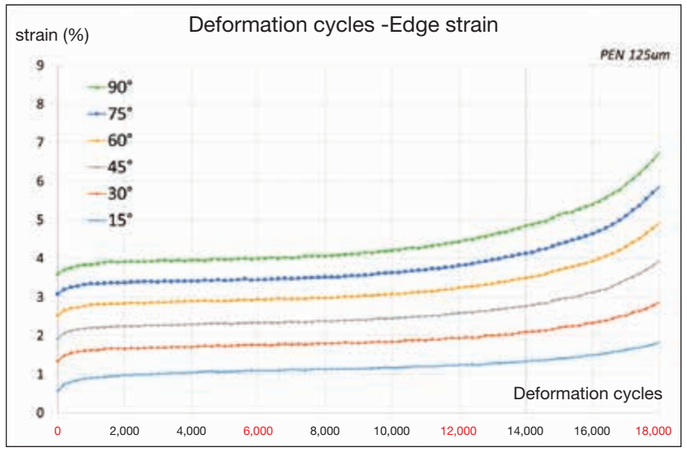
You can download the specification.

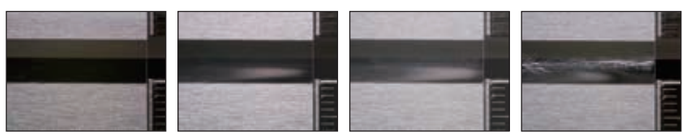
Composition

FOLD

Examples

This system analyzes a maximum curvature on a neutral plane from an observed shadow shape of specimen, then calculates the surface strain from a curvature and the given its thickness.





Example of Test Pieces

- Flexible Devices Products
- Thin Film Materials
- Flexible Devices
- Flexible Printed Circuits
- Flat Wearable Products
- Wearable Products
- Pressure Sensor
- IC tag
- Wire Harness
- Flexible Panels
- Electric Cables
- Optical fiber Cables
- Fine Cables
- Home Appliance Cables
- Fibers (Planar)
- Fibers (Linear)
- Connectors
- Gears

inquiry/

If you have any question, please ask us.

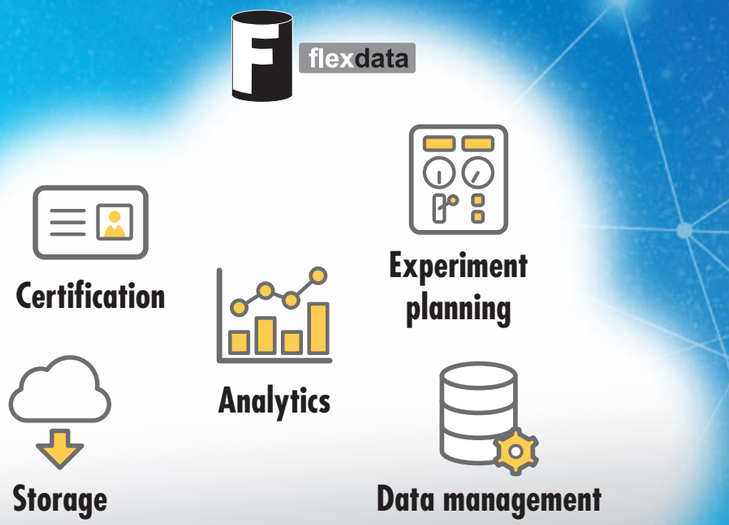
*Refer to p. 48 regarding the driving unit specification.

Get data in real time, from anywhere in the world.

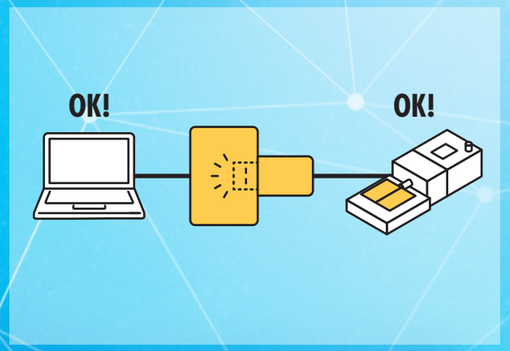
Endurance Test Platform

Flexdata

New platform “Flexdata” enables the users to monitor testing data in real time from anywhere in the world, moreover to analyze or save the data, and also to program the test or the measure on the cloud.

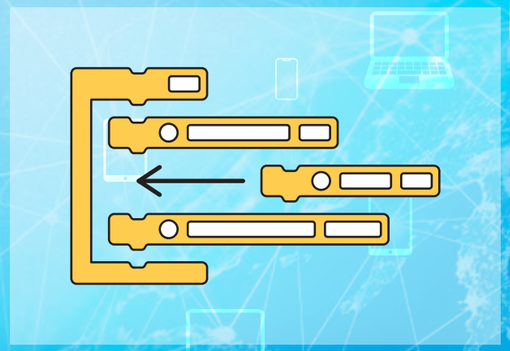


Easier setting



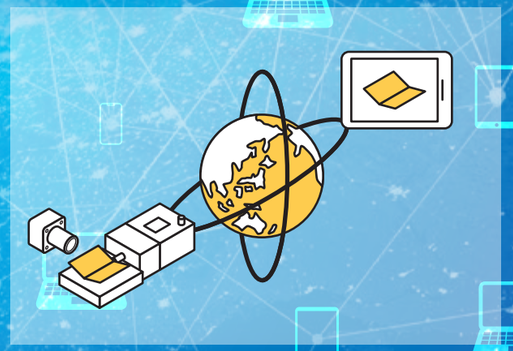
Easy to set and register the Endurance test machine, measuring equipment, and camera, etc. which are connected to PC.

By visualized programing



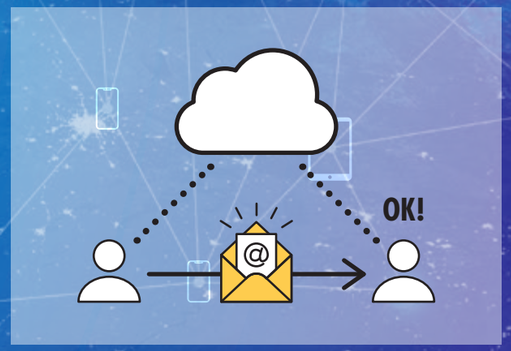
Control and measuring timing can freely be set by visualized programing.

Anytime and from Anywhere in the world



Test status can be checked in real time. Multiple cameras can freely be installed.

Test status and its data can also be shared



Testing status and Test data can also be shared by reference from the account owner.

Y's Block
Endurance Test Machine

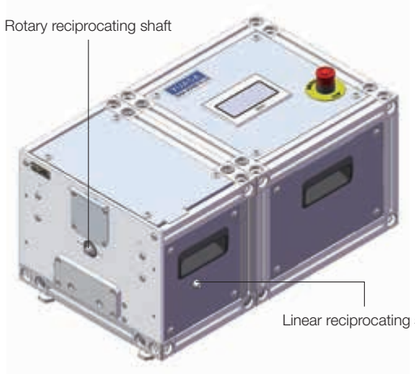
Specification of Base Unit

Type DR11SRB / DR11SRP
DR11MR / DR11MR4 / DR11MR5 / DR11MR3

Those are driving unit for endurance test machine which operate repeatedly under presetting test condition.
Disconnection detecting system of electric conductor and pre-settable testing counter are originally equipped, so unmanned automated operation can be implemented.

DR11SRB

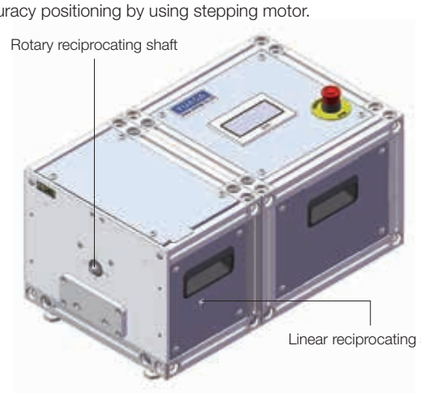
This unit is suit for long-time repeating test. Mechanical link structure and resinous gear achieved high durability and silence.



Maximum operation angle: ±270°
Maximum operation stroke: ±60mm
Maximum operation speed: 120 rec./min

DR11SRP

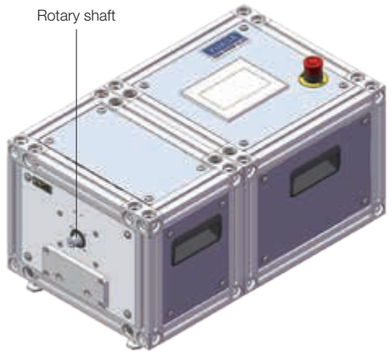
It is possible to set a variety of test conditions, and test conditions can be set by touch panel. This driving unit can provide high accuracy positioning by using stepping motor.



Maximum operation angle: ±270°
Maximum operation stroke: ±60mm
Maximum operation speed: 90 rec./min

DR11MR / DR11MR4 / DR11MR5

It is possible to set a variety of test conditions, and test conditions can be set by touch panel. This driving unit can provide high accuracy positioning by using stepping motor. This driving can be operated with larger test jig or higher speed because this series is more powerful than DR11SRP.

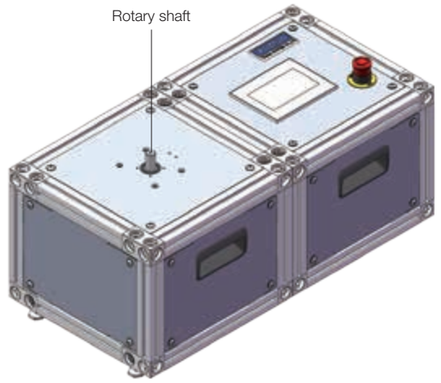


Maximum operation angle: ±3600° (Both 10 revolutions)
*Twisting number is not limited when twisting is in one direction.
Maximum operation speed: approx. 200 rec./min

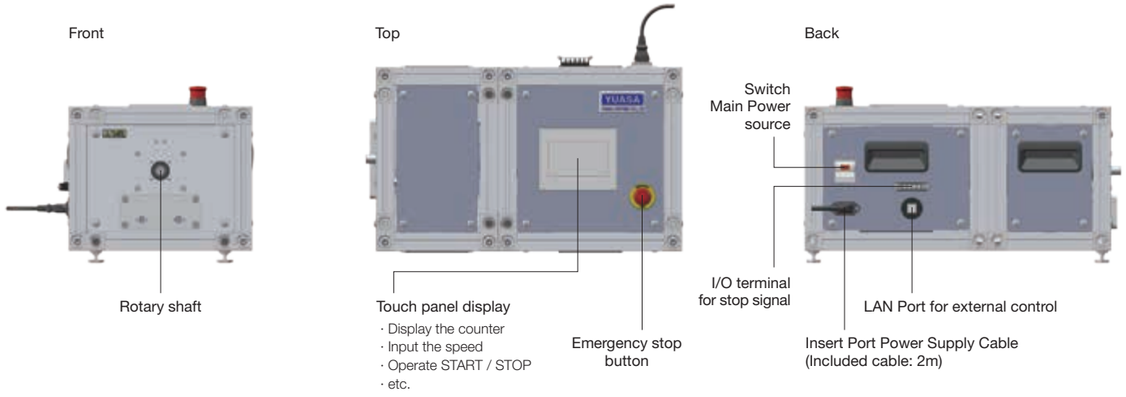
- DR11MR4 / DR11MR5: when turn off the power,connected attachment does not move because motor is locked.
- DR11MR5 is high output specification.

DR11MR3

It is possible to set a variety of test conditions, and test conditions can be set by touch panel. This driving unit can provide high accuracy positioning by using stepping motor. DR11MR3 is a different type of DR11MR series.



Maximum operation angle: ±3600° (Both 10 revolutions)
*Twisting number is not limited when twisting is in one direction.
Maximum operation speed: approx. 100rec./ min



Basic Specifications

*No test jigs are included for each unit.

	DR11SRB	
	Rotary Reciprocation Mode	Linear Reciprocation Mode
Electrical Power	AC100-240V (50/60 Hz) 1AT	
Motor Unit	DC brushless motor [DC24V, 3.5A(max.), 30W, Gear box 1/20]	
Reciprocating Speed	10-120 rec/min	
Reciprocating Angle / Distance	0-±270 deg.	0-±60 mm
Permissible Torque / Output	± 90° : 1.00 N·m ±180° : 0.88 N·m ±270° : 0.44 N·m (max. 1.00 N·m)	1800/st. (max. 400 N)
Counter	8-digits display (Can set the target number)	
Installation Environment	Temp. : +5-+40°C (41-104°F) Humi. : 15-85%Rh (No condensation)	
Safety Interlock	Safety cover for the testing jig: Covered or Not	
Dimension (Excluding projection)	W 500 mm × D 300 mm × H 255 mm	
Weight	21kg	

	DR11SRP	
	Rotary Reciprocation Mode	Linear Reciprocation Mode
Electrical Power	AC100-240V (50/60 Hz) 1AT	
Motor Unit	Stepping motor [DC48V, 1.72A(max.), 30W, Gear box 1/20]	
Reciprocating Speed	5-90 rec/min	
Acceleration	360 rad/s^2 maximum	4.5 m/s^2 maximum
Reciprocating Angle / Distance	7-±270 deg. (in 0.1 deg. increments)	3-120 mm (in 0.1 mm increments)
Permissible Torque / Output	1.8 N·m	72 N
Counter	8-digits display (Can set the target number)	
Installation Environment	Temp. : +5-+40°C (41-104°F) Humi. : 15-85%Rh (No condensation)	
Safety Interlock	Safety cover for the testing jig: Covered or Not	
Dimension (Excluding projection)	W 500 mm × D 300 mm × H 255 mm	
Weight	20kg	

	DR11MR	DR11MR4	DR11MR5	DR11MR3
Electric Power	AC100-240V (50/60 Hz) 15AT (Select either AC100-120V or AC200-240V for DR11MR5)			
Motor Unit	Stepping motor (DR11MR4 / DR11MR5 with brake function.)			
Angle	Rotary Reciprocation Mode: 7-±3600 deg. / Continuous rotation Mode: One-way rotation			
Rotary Speed	1-1200 deg / sec			1-600 deg / sec
Permissible Torque	6.5 N·m	6.5 N·m	20 N·m	6.5 N·m
Permissible Moment of inertia	2.0 × 10^{-3} kg/m^2	2.0 × 10^{-3} kg/m^2	1.5 × 10^{-3} kg/m^2	2.0 × 10^{-3} kg/m^2
Output Shaft Static Rated Moment	1.5 N·m	1.5 N·m	4.0 N·m	1.5 N·m
Counter	8-digits display (Can set the target number)			
Installation Environment	Temp. : +5-40°C / Humi. : 15-85%Rh (No Condensation)			
Safety Interlock	Safety cover for the testing jig: Converted or Not			
Dimension (Excluding projection)	W 500mm × D 300mm × H 255mm	W 600mm × D 300mm × H 255mm	W 650mm × D 300mm × H 255mm	W 600mm × D 300mm × H 255mm
Weight	20kg	23kg	27kg	21kg

https://www.yuasa-system.jp/en/

MODELS test/ysblock/

You can download the specification.

inquiry/

If you have any question, please ask us.

YUASA SYSTEM ENDURANCE TEST SYSTEM

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Research & Development

Laboratory Automation

Factory Automation

YUASA SYSTEM CO., LTD.

Our product information is also available on
https://www.yuasa-system.jp/en

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Safety Note To ensure your safe and proper usage, please observe all the manuals before using these machines.

2022.05 Ver. 3.0