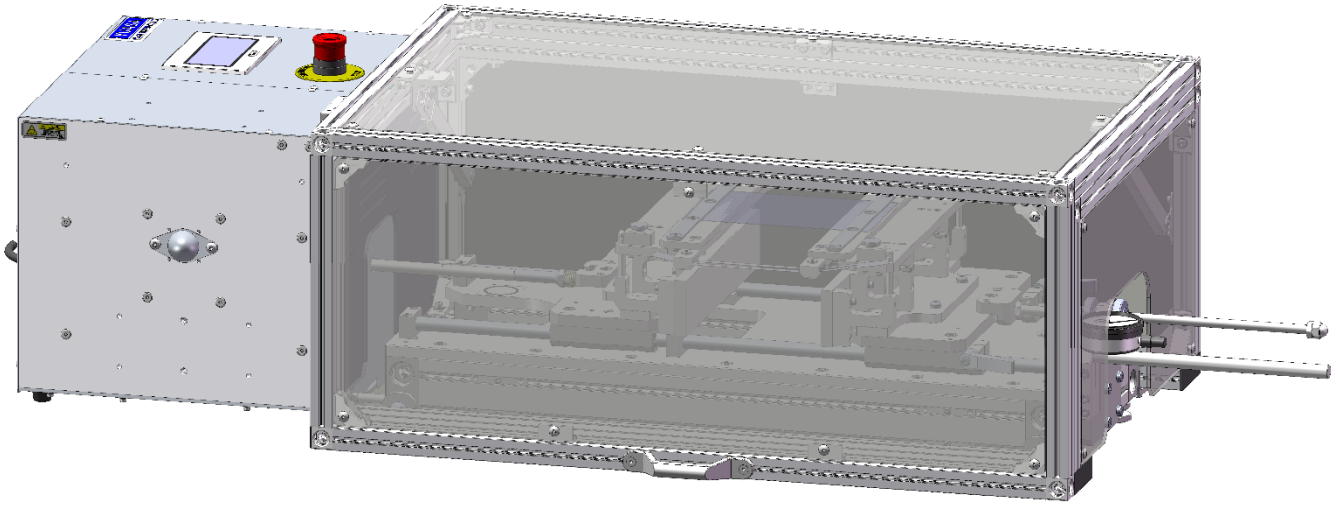
ET250007UM0002/00

USER MANUAL
DMX-FSN



YUASA
YUASA SYSTEM CO., LTD.

- CONTENTS -

Safety precautions are classified into five categories.

WARNING : Death or serious injury may result from not following product installation instruction.
CAUTION : Minor injury, as well as damage to the product may result from not following product instruction.
NOTICE : Inaccurate data may result from not following the test instructions.
NOTE : General knowledge.
INTERLOCK : Effect of the interlock system for safety.

INTERLOCK : Install a personal safety cover and prevent access to any moving parts.
WARNING : Installing, operating, maintaining, or inspecting must be carried out by skilled and professional engineers.
WARNING : Make sure to tighten each screw as described in this manual.
WARNING : Make sure the Emergency Stop Button is made work, and the machine is completely stopped before adjusting any testing conditions and change any parts.
WARNING : Make sure the power is switched off, and the machine is completely stopped before carrying out maintenance and inspection.
WARNING : Do not use products beyond its capacity as specified in the specification.
WARNING : Do not remodel.
CAUTION : Do not change installation environment (temperature and humidity) rapidly.
CAUTION : Isolate the machine from sunlight.
CAUTION : Isolate the machine from any noise.
CAUTION : Isolate the machine from any dust.
CAUTION : Isolate the machine from large vibration.
CAUTION : Immediately stop the machine upon any sign of abnormal operation.
NOTICE : Make sure to tighten the screws as described in the manual.
NOTE : In some cases, illustrations with different shapes may be included.
NOTE : In some cases, a description different from your equipment may be included.
NOTE : The scraps should be disposed as general waste by skilled professionals.

【MEMO】

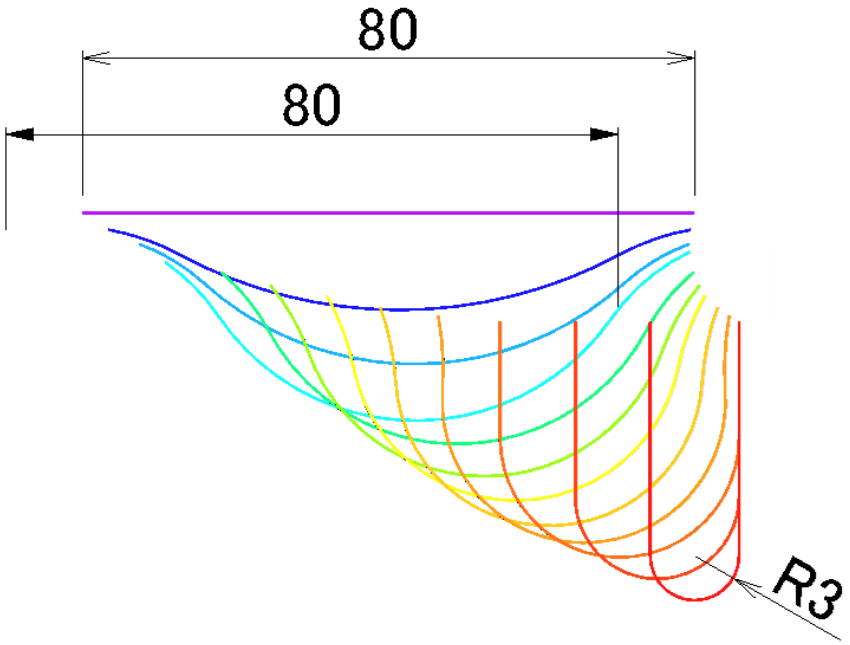
1. Tension-Free Folding [+ET250020A0001+ET251001A0001]

Modules repeatedly deform a sample from straight to U-shape without unnecessary stresses.

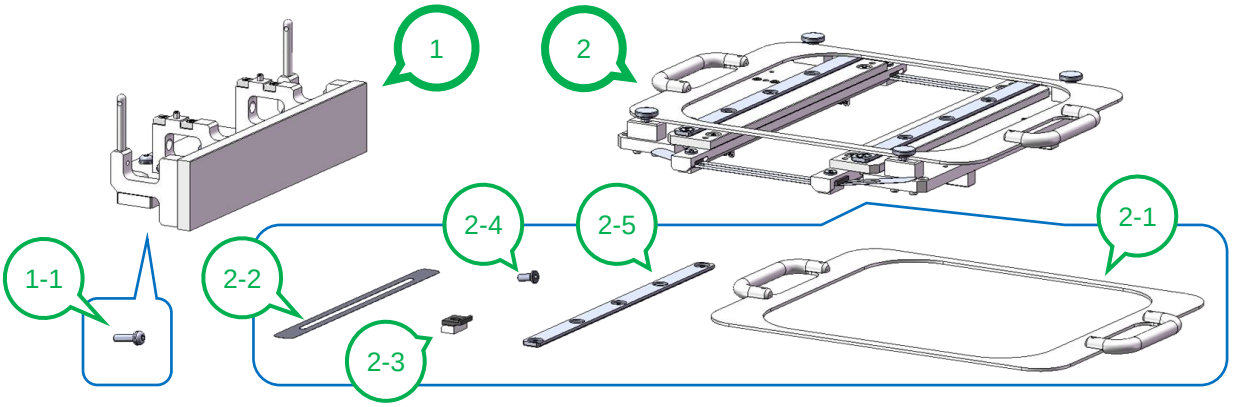
Tension-Free structure never apply unnecessary tensile stresses nor compressive stresses on a sample.

Only when the jig is driven by a numeric controlling unit like DMLHP, target folding radius can be changed even during running a test.

Deformation profile example [Folding radius: 3 mm]



1.1 Testing Modules (representative example)



No.	NAME	TYPE	Num.	MANUFACTURE (MATERIAL)
1	**Wall module**	**ET250020A0001**	**2**	**YUASA SYSTEM**
1-1	Cap screw +SW +PW	M5x20	4	(Stainless steel)
2	**FS cartridge**	**ET251001A0001**	**1**	**YUASA SYSTEM**
2-1	Handling plate	YP000P0000007	1	YUASA SYSTEM
2-2	Tilt controller	YP000P0000061	2	YUASA SYSTEM
2-3	Holder for tilt controller	YP000P0000035+0000058	4	YUASA SYSTEM
2-4	Extra low head cap screw	CBSTS5-12		MISUMI
2-5	Clamping bar	YP000P55+56	2	YUASA SYSTEM

NOTE Refer to each specification sheet for parts with different materials and/or shapes.

NOTE Please contact to sales or agent if something extra parts or new designed options are necessary.

1.2 Assembling Testing Modules (Case of DMLHP)

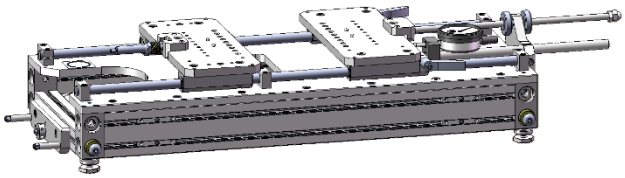
Instructions video

QR

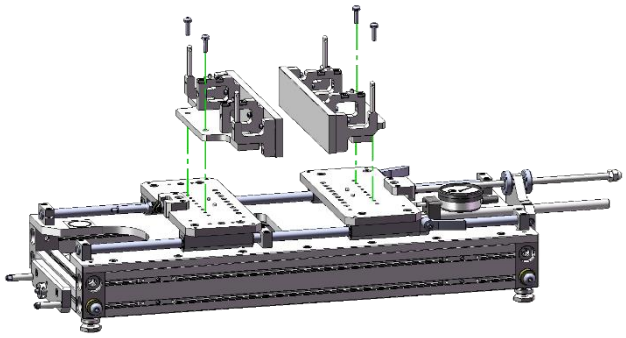
Tools: Allen wrench (3mm)

1) POSITION DMLHP 'the moving slider' to zero, then open the safety cover.

NOTE In case of DMLHB, set reciprocation distance to ±60mm, then move it to full-forward.

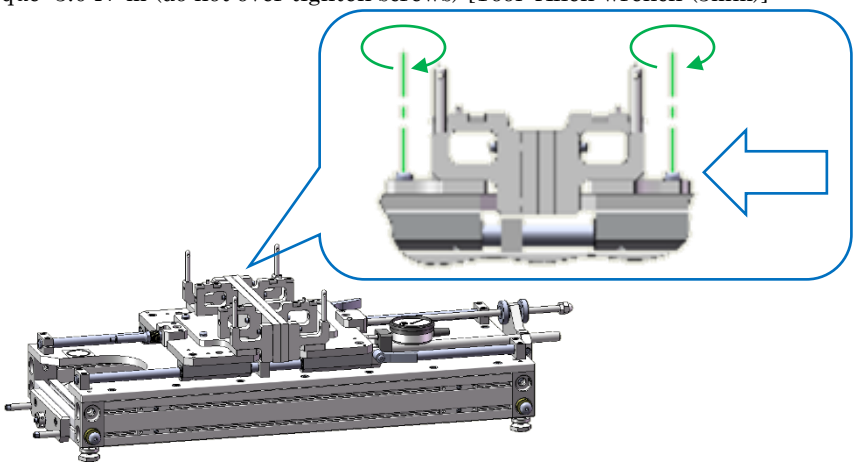


2) PUT wall modules on each "moving and fixed" slider.

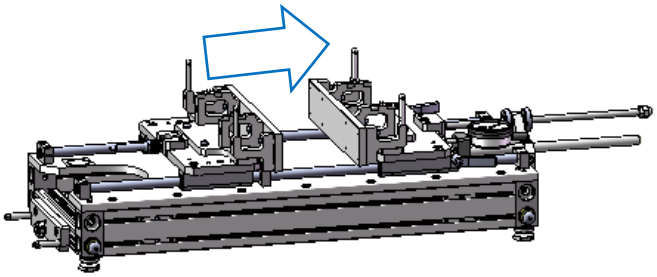


3) MOVE the fixed slider to touch a wall module against another one, then fix them.

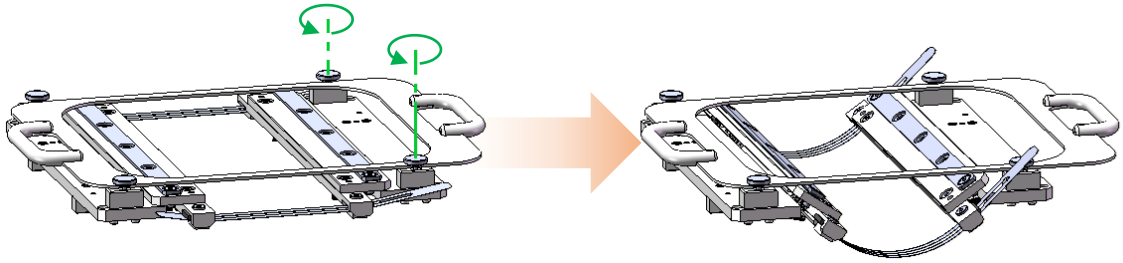
CAUTION Tightening torque: 3.0 N·m (do not over tighten screws) [Tool: Allen wrench (3mm)]



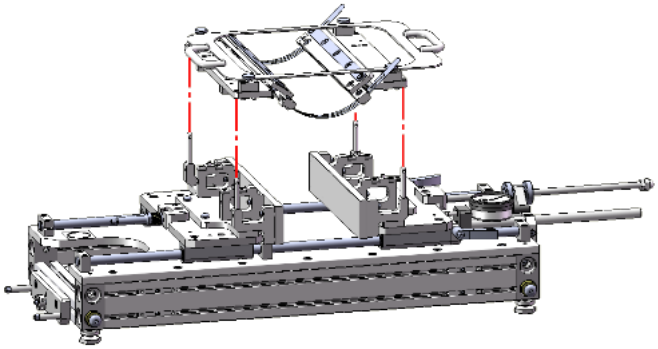
4) MOVE the fixed slider about 100 mm far from the moving slider.



5) LOOSEN two knurled screws of the FS cartridge.

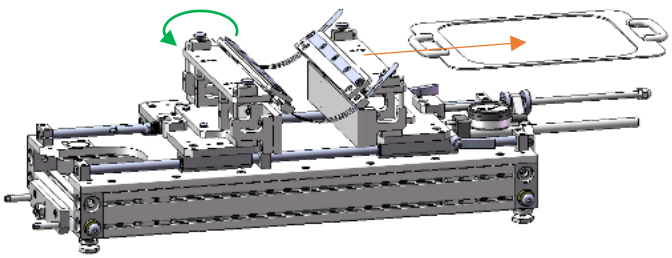


6) ALIGN the FS cartridge to guiding pins and PUT the FS cartridge on wall modules.



7) LOOSEN two knurled screws to remove the handling plate.

CAUTION Surely tighten four knurled screws after removing the handling plate to prevent screws from dropping out by vibration.



1.3 Setting Testing Conditions

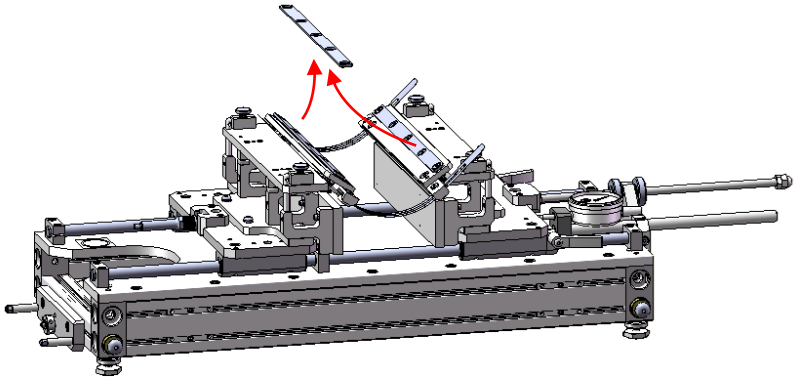
・DMLHP (Driving units with Stepping motor/Servo motor)

Instructions video

QR

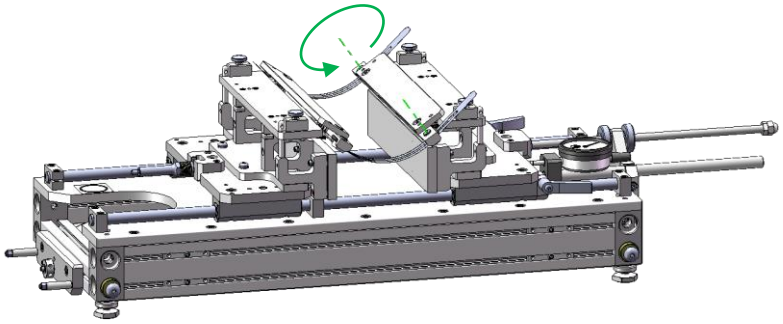
Tools: Allen wrench (3mm)

1) REMOVE clamping bars from the FS cartridge.

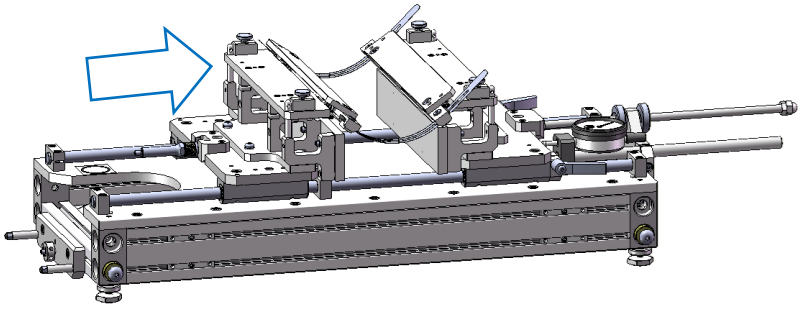


2) LOOSEN two screws which holding tilt controller, on the fixed slider.

CAUTION Surely hold the tilt clamp to prevent it from suddenly falling down when loosening the second of two screws.

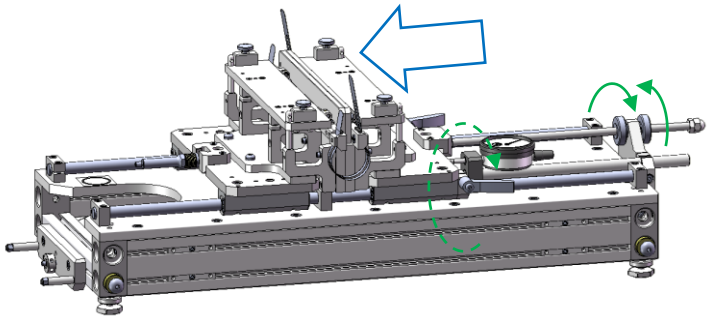


3) POSITION the moving slider to zero.

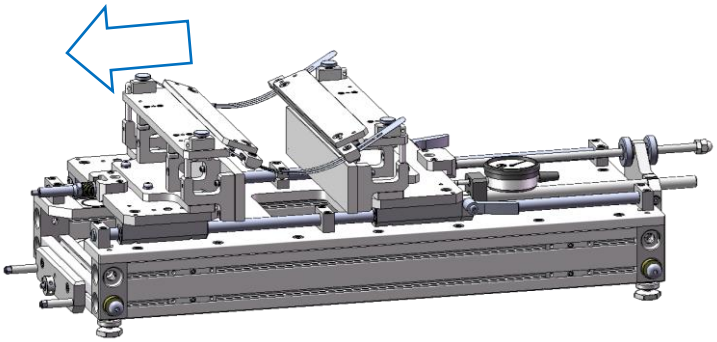


4) MOVE the fixed slider to touch against the moving slide, then fix its position.

NOTE Use levers to fix the fixed slider position when the jig does not have the minute adjuster.

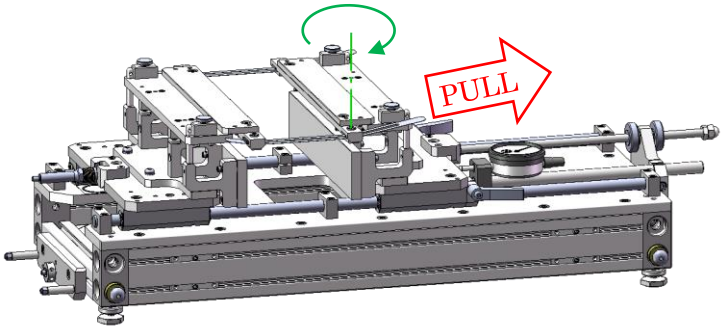


5) POSITION DMLHP “the moving slider” to a position where [Folding radius x2 +80].



6) ADJUST tilt controllers to lift tilt clamps becoming parallel, then tighten screws of holders.

CAUTION Tightening torque: 3.0 N・m (do not over tighten screws) [Tool: Allen wrench (3mm)]



7) SET ‘+SP’ to ‘current position’ and ‘-SP’ to ‘folding radius x2 (folding diameter)’.

NOTE Refer to a manual of the driving unit for detail.

8) SET reciprocation speed.

NOTE Refer to a manual of the driving unit for detail.

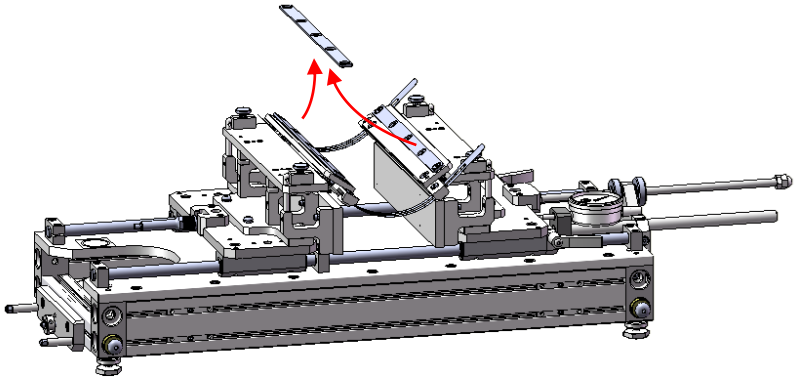
・DMLHB (Driving units with Mechanical links)

Instructions video

QR

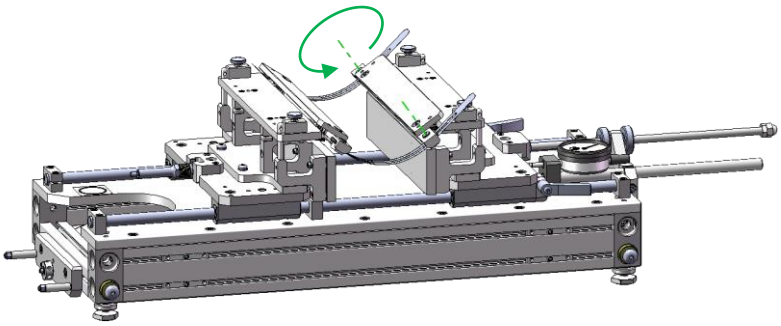
Tools: Allen wrench (3mm)

1) REMOVE clamping bars from the FS cartridge.



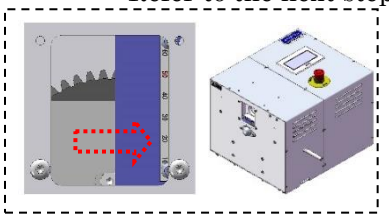
2) LOOSEN two screws which holding tilt controller, on the fixed slider.

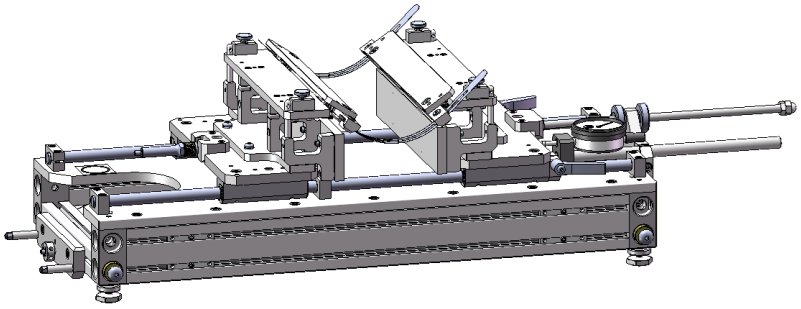
CAUTION Surely hold the tilt clamp to prevent it from suddenly falling down when loosening the second of two screws.



3) SET reciprocation distance to '±60mm' then move the moving slider to the full-forward.

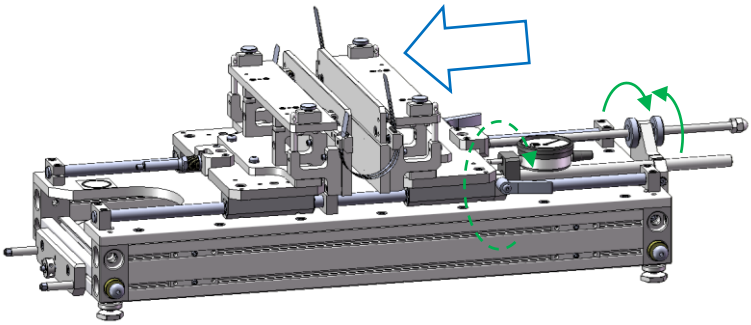
NOTE Can set reciprocation distance to ±40 mm or more if the folding radius is good enough large. Refer to the next step.



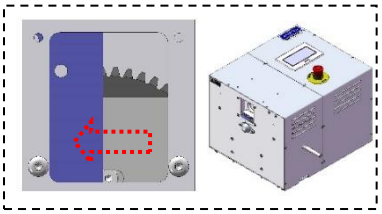


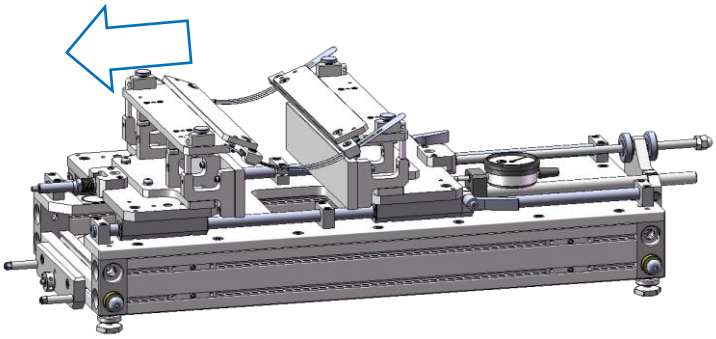
4) MOVE the fixed slider to make distance between walls to 'folding radius x2', then fix its position.

NOTE Use levers to fix the fixed slider position when the jig does not have the minute adjuster.



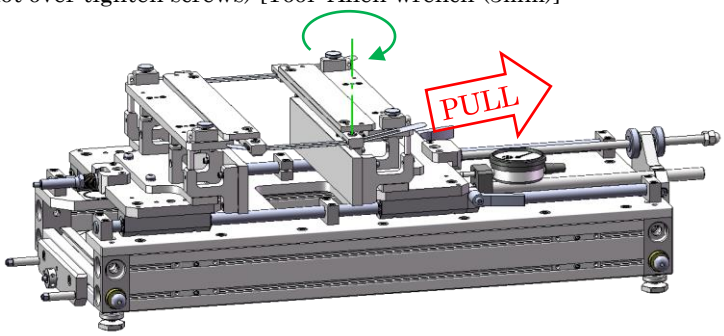
5) MOVE the moving slider to the rearmost.





6) ADJUST tilt controllers to lift tilt clamps becoming parallel, then tighten screws of holders.

CAUTION Tightening torque: 3.0 N･m (do not over tighten screws) [Tool: Allen wrench (3mm)]



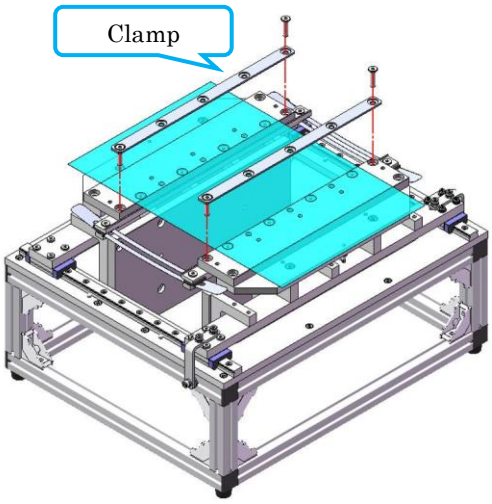
7) SET reciprocation speed.

NOTE Refer to a manual of the driving unit for detail.

1.4 Setting Sample

Set a sample to tilt clamps with clamping bars or something adhesives.

NOTE It is unnecessary to hold a sample with huge force because of Tension-Free structure.

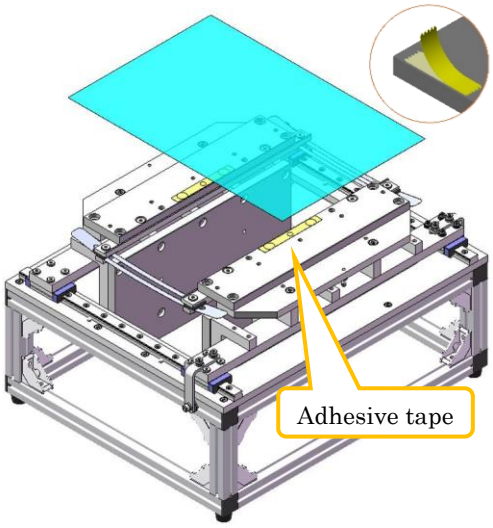


◆Set with clamps

・The adhesive does not stick on the sample.

・Surface of the sample is oily or dirty or …

・Etcetera…



◆Set with adhesive tapes

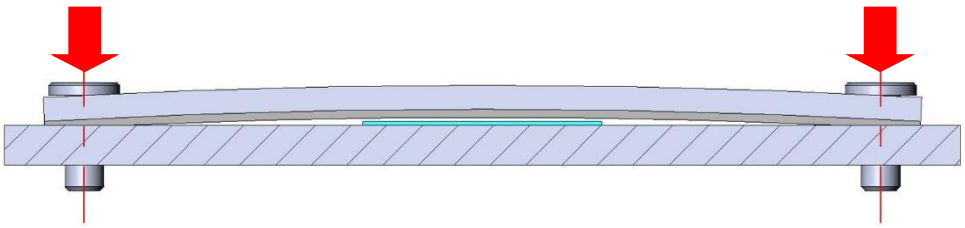
・The folding radius is too small.

・The sample will break with clamps.

・Set samples of various thickness in same time. Etcetera…

NOTICE Tightening torque varies according to the sample or test condition.

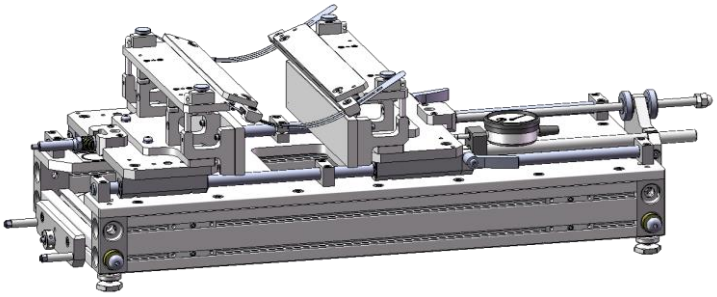
CAUTION If tighten screws with huge torque, the clamp becomes curve then cannot pinch the sample.



Check interference each components with low speed or hand moving.

INTERLOCK Cannot operate equipment with the operation panel whenever the safety cover opened.

1.5 Maintenance

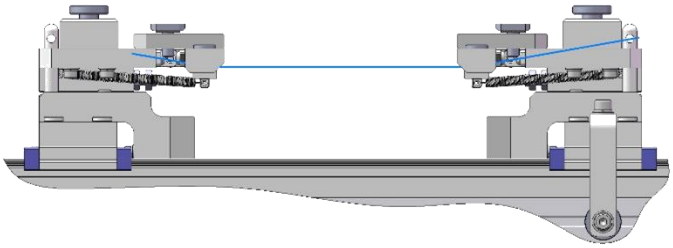


No.	INSPECTION	CYCLE	RESULT
1	Is there any damage to tilt controllers?	Daily	OK / NG
2	Is not noise generated?	Daily	OK / NG
3	Change tilt controllers	Every before testing	OK / NG

Tilt controller: damage example

NOTICE Change tilt controllers to new ones when one of them is deformed or broken.

1) MOVE the moving slider to rearmost to make working space.

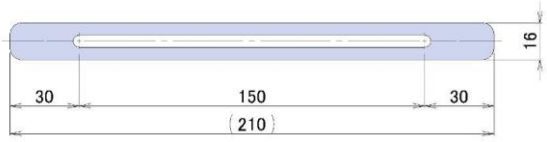


2) Remove all two screws of tilt controller holders which hold one of tilt controllers.

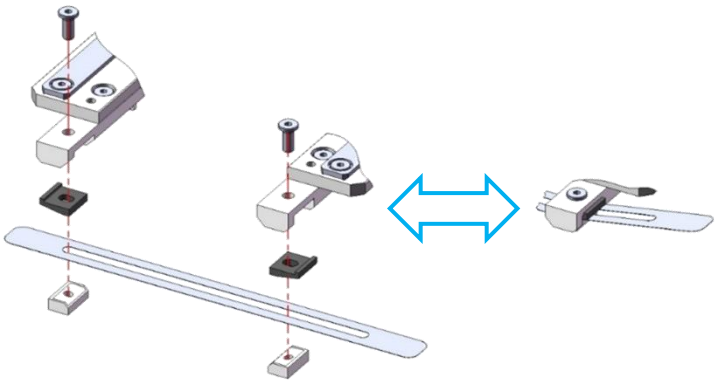
NOTE Make sure that do not lose any small parts.

3) Assemble a new tilt controller.

NOTE Tilt controller: YP000P0000061



CAUTION Refer to below illustration for direction of holders.

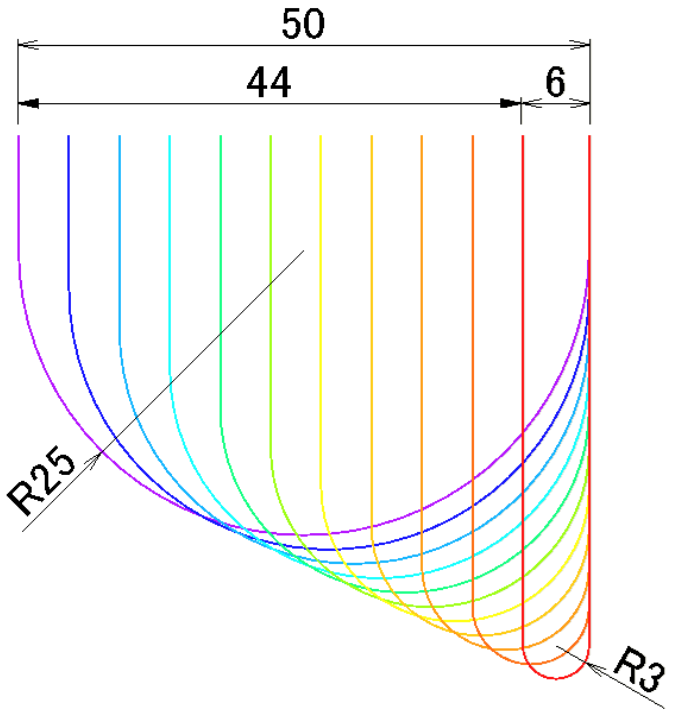


2. Variable Radius Folding [+ET250020A0001]

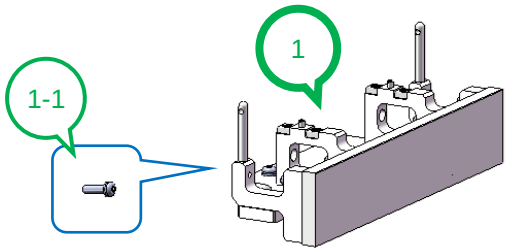
Modules repeatedly change folding radius of U-shape samples.

Only when the jig is driven by a numeric controlling unit like DMLHP, target folding radius can be changed even during running a test.

Deformation profile example [Folding radius: 25mm ⇔ 3mm]



2.1 Testing Modules (representative example)



No.	NAME	TYPE	Num.	MANUFACTURE (MATERIAL)
1	**Wall module**	**ET250020A0001**	**2**	**YUASA SYSTEM**
1-1	Cap screw +SW +PW	M5x20	4	(Stainless steel)

NOTE Refer to each specification sheet for parts with different materials and/or shapes.

NOTE Please contact to sales or agent if something extra parts or new designed options are necessary.

2.2 Assembling Testing Modules (Case of DMLHP)

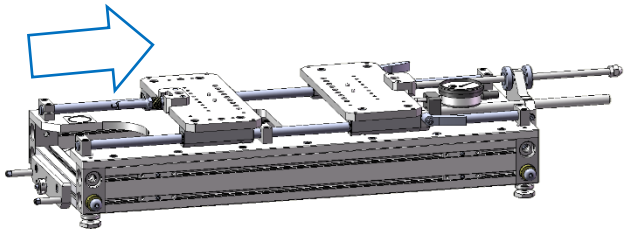
Instructions video

QR

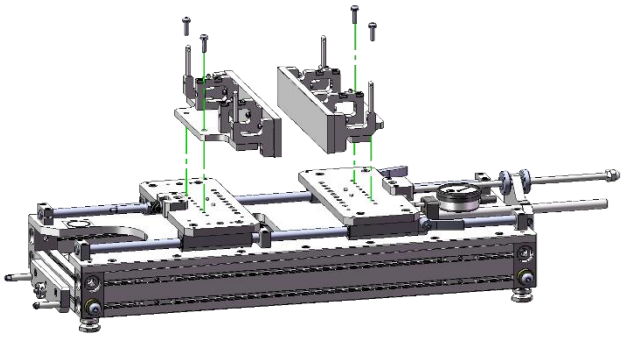
Tools: Allen wrench (3mm)

1) POSITION DMLHP “the moving slider’ to zero, then open the safety cover.

NOTE Case on DMLHB, set reciprocation distance to ±60 mm, then move it to the full-forward.

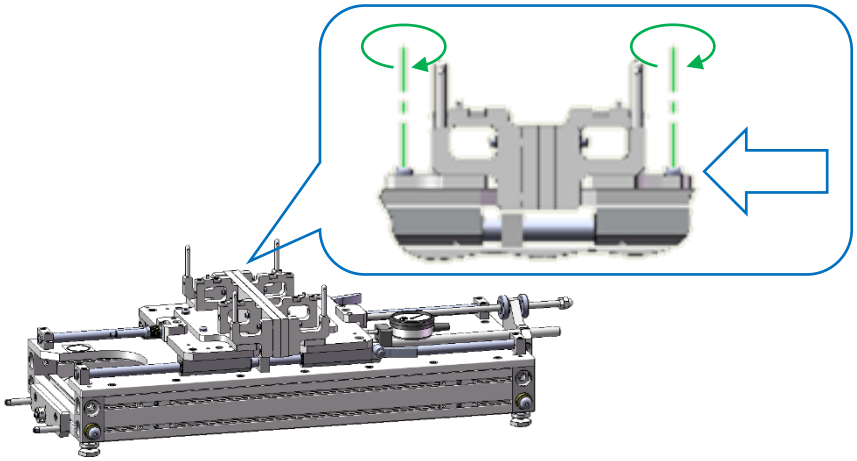


2) PUT wall modules on each “moving and fixed” slider.



3) MOVE the fixed slider to touch a wall module against another one, then fix them.

CAUTION Tightening torque: 3.0 N·m (do not over tighten screws) [Tool: Allen wrench (3mm)]



2.3 Setting Testing Conditions

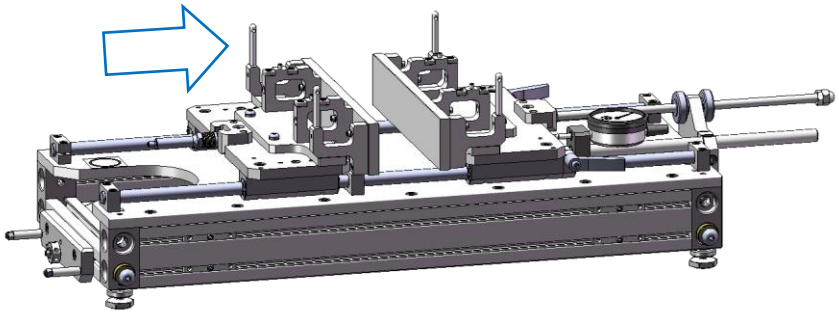
・DMLHP (Driving units with Stepping motor/Servo motor)

Instructions video

QR

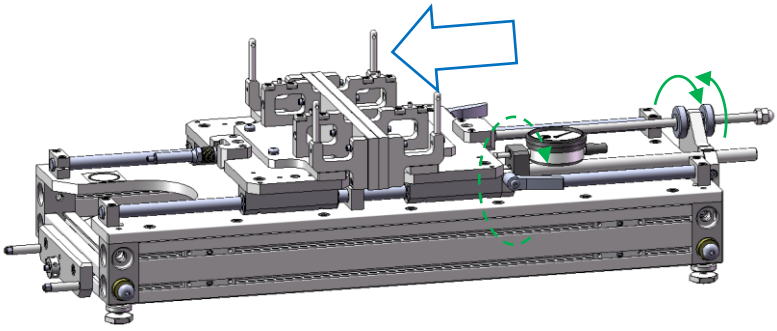
Tools: Allen wrench (3mm)

1) POSITION DMLHP to zero.

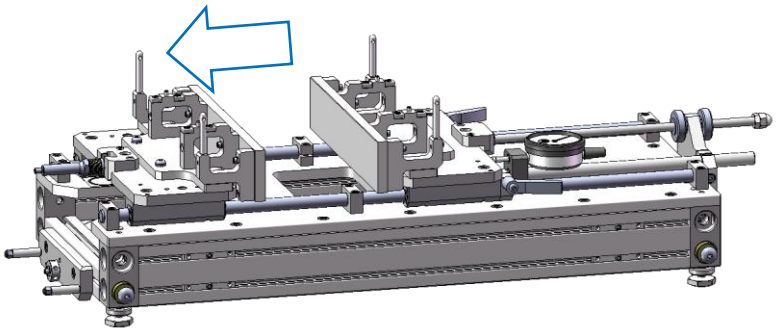


2) MOVE the fixed slider to touch against the moving slide, then fix its position.

NOTE Use levers to fix the fixed slider position when the jig does not have the minute adjuster.



3) POSITION the moving slider to 'maximum folding radius x2'.



4) Set '+SP' to 'current position' and '-SP' to 'minimum folding radius x2'.

NOTE Refer to a manual of the driving unit for detail.

5) SET reciprocation speed.

NOTE Refer to a manual of the driving unit for detail.

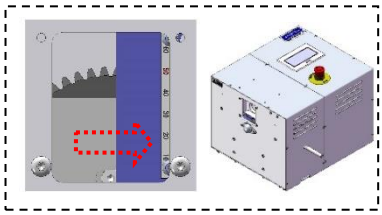
・DMLHB (Driving units with Mechanical links)

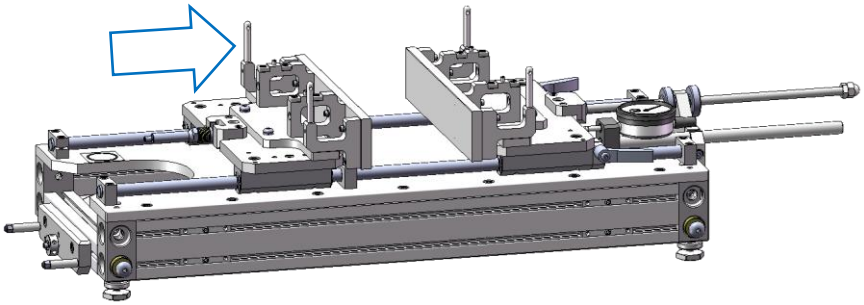
Instructions video

QR

Tools: Allen wrench (3mm)

1) SET reciprocation distance to ±'maximum folding radius – minimum folding radius', then move it to the full-forward.

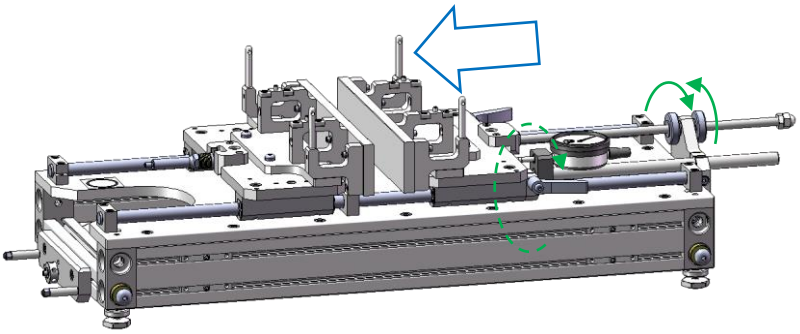




2) MOVE the fixed slider to make distance between a pair of wall sliders to 'minimum folding radiusx2', then fix its position.

NOTE Use levers to fix the fixed slider position when the jig does not have the minute adjuster.

NOTE Change testing conditions or driving unit if fixed slider cannot be moved to target position.



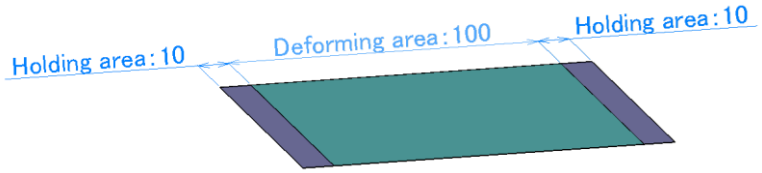
3) SET reciprocation speed.

NOTE Refer to a manual of the driving unit for detail.

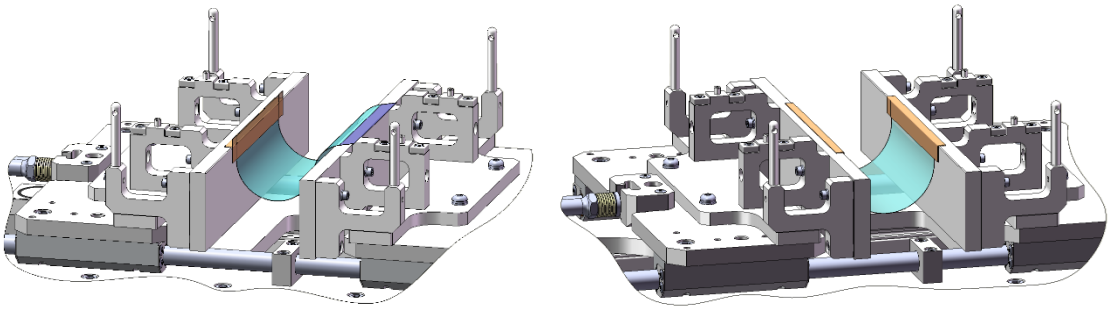
2.4 Setting Sample

1) PREPARE a sample.

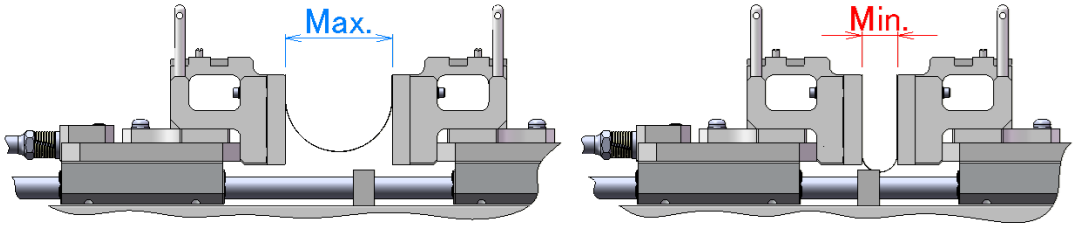
As an example, a sample is prepared to be deformed to radius 30mm maximum and holden 10 mm each end. So, deformed are must be about 100mm (maximum folding radius 30 xπ94.248 ≒ 100) or more.



2) Adhere the sample to wall modules with adhesive tapes or something.

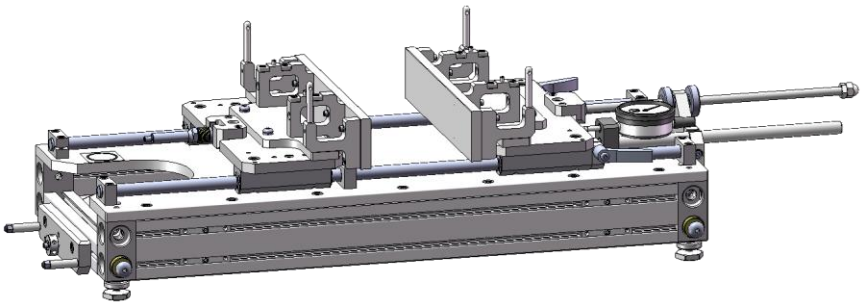


NOTICE Confirm that the sample has enough length at the rearmost (for maximum folding radius), and the walls have enough length at the full-forward (for minimum folding radius) to support the sample, undeformed area.



NOTE Please contact to sales or agent if something extra parts or new designed options are necessary.

2.5 Maintenance



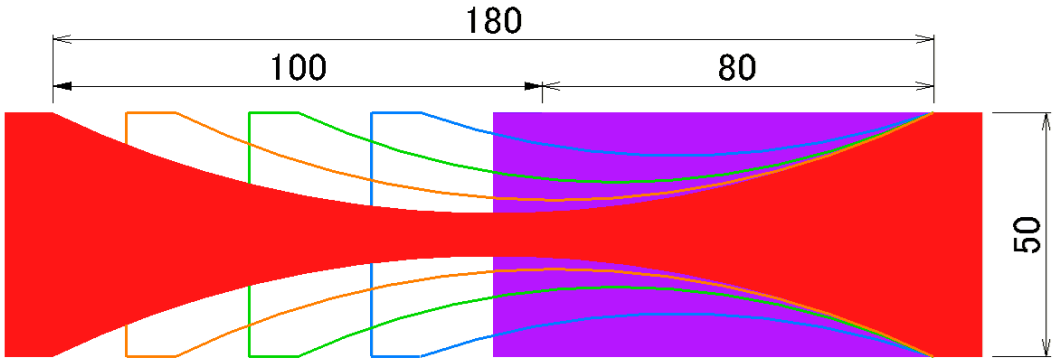
No.	INSPECTION	CYCLE	RESULT
1	Is not noise generated?	Daily	OK / NG
2	Is there any damage to each wall?	Every before testing	OK / NG

3. Stretching [+ET255001A0002+ET255002A0001]

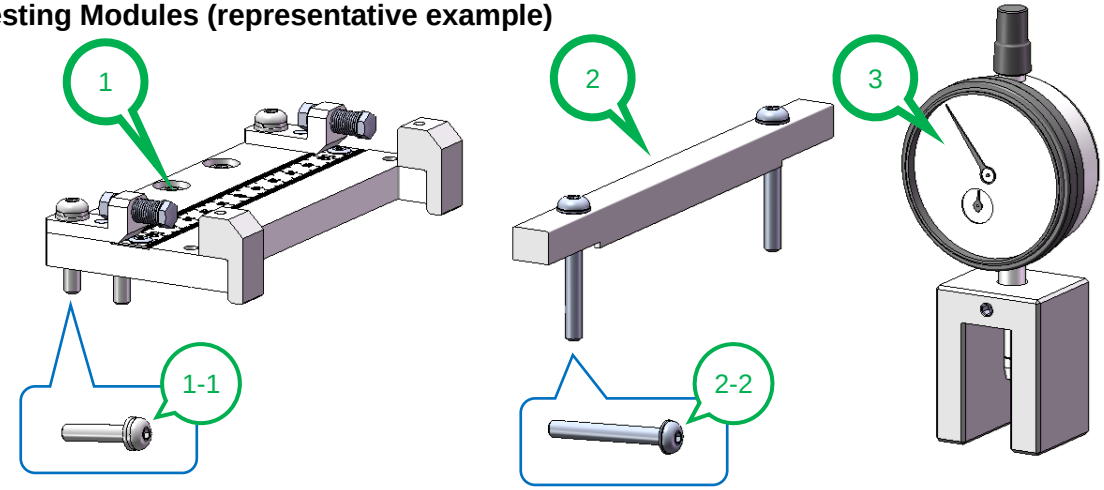
Modules repeatedly stretch a sample.

Only when the jig is driven by a numeric controlling unit like DMLHP, stretching length can be changed even during running a test.

Deformation profile example



3.1 Testing Modules (representative example)



No.	NAME	TYPE	Num.	MANUFACTURE (MATERIAL)
1	**Clamping base**	**ET255001A0002**	**2**	**YUASA SYSTEM**
1-1	Cap screw +SW +PW	M5x25	10	(Stainless steel)
2	**Clamping bar**	**ET255002A0001**	**2**	**YUASA SYSTEM**
2-1	Button head ap screw +SW +PW	M5x40+WSSS10-5-1	4	MISUMI (Stainless steel)
3	**Squashing gauge**	**ET255003A0001**	**2**	**YUASA SYSTEM**

NOTE Refer to each specification sheet for parts with different materials and/or shapes.

NOTE Squashing gauge only be used for setting a sample. It is not a testing jig.

NOTE Please contact to sales or agent if something extra parts or new designed options are necessary.

3.2 Assembling Testing Modules (Case of DMLHP)

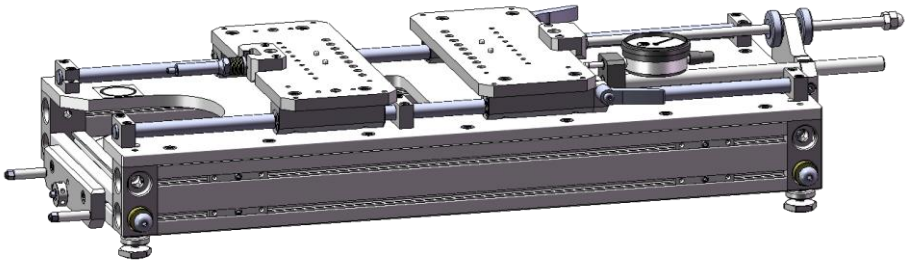
Instructions video

QR

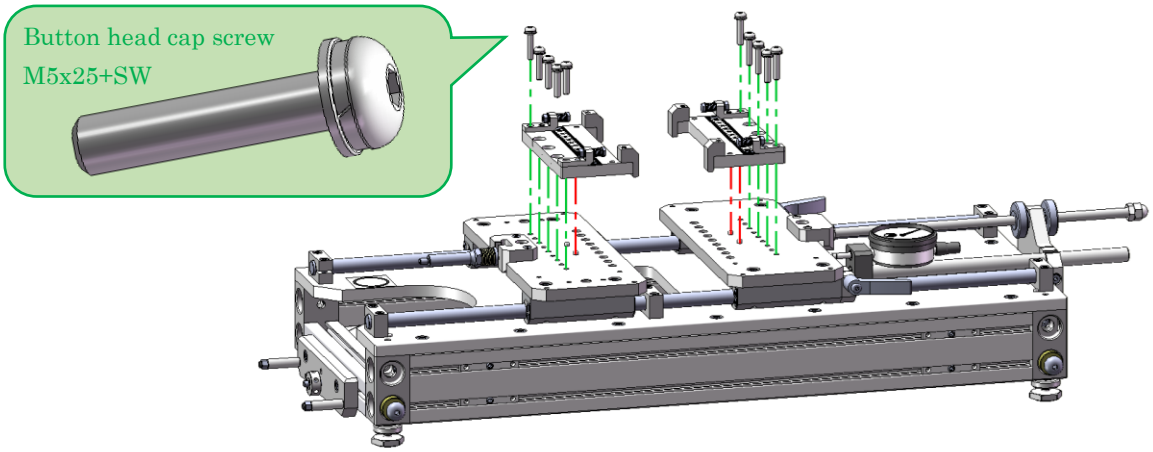
Tools: Allen wrench (3mm)

1) POSITION DMLHP to zero, then open the safety cover.

NOTE Case on DMLHB, set reciprocation distance to ±60 mm, then move it to the full-forward.

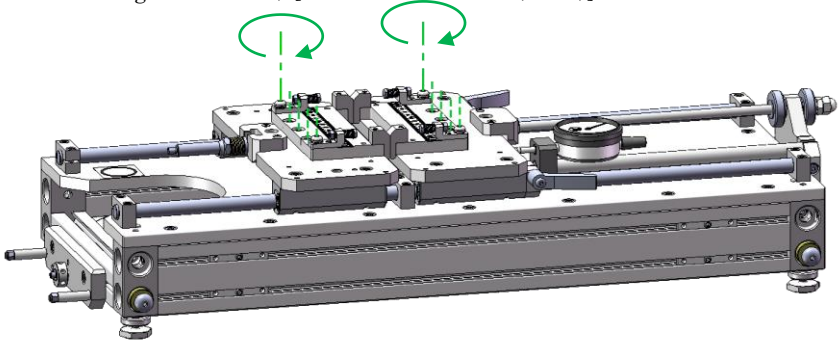


2) PUT clamping bases on sliders.



3) MOVE the fixed slider to touch a clamping base against another one, then fix them.

CAUTION Tightening torque: 3.0 N･m (do not over tighten screws) [Tool: Allen wrench (3mm)]



3.3 Setting Testing Conditions

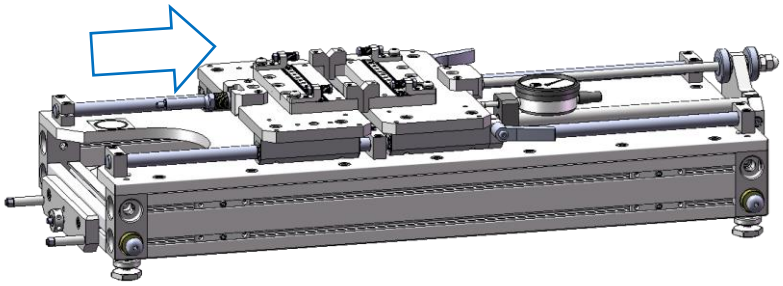
・DMLHP (Driving units with Stepping motor/Servo motor)

Instructions video

QR

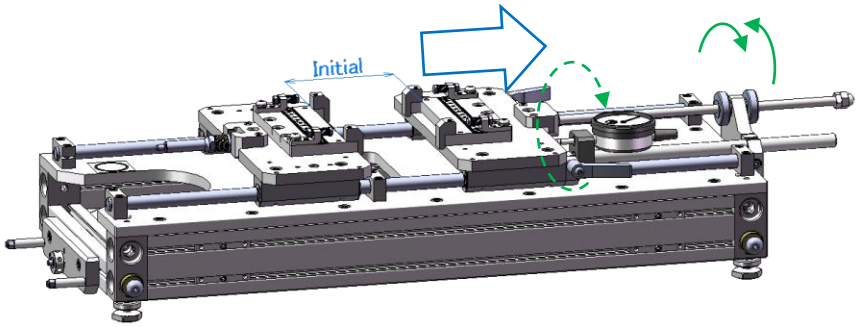
Tools: Allen wrench (3mm)

1) POSITION DMLHP to zero.



2) MOVE the fixed slider to make distance between clamps as initial sample length, then fix it.

NOTE Use levers to fix the fixed slider position when the jig does not have the minute adjuster.



3) SET '+SP' to 'stretching length' and '-SP' to 'zero'.

NOTE Refer to a manual of the driving unit for detail.

4) SET reciprocation speed.

NOTE Refer to a manual of the driving unit for detail.

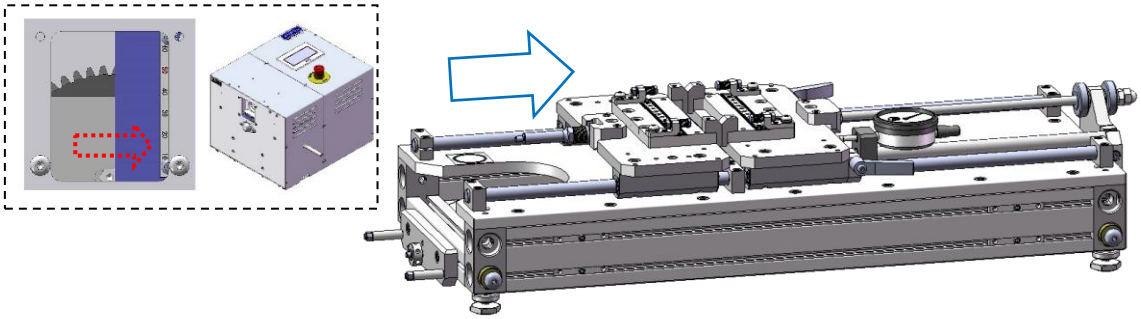
・DMLHB (Driving units with Mechanical links)

Instructions video

Q R

Tools: Allen wrench (3mm)

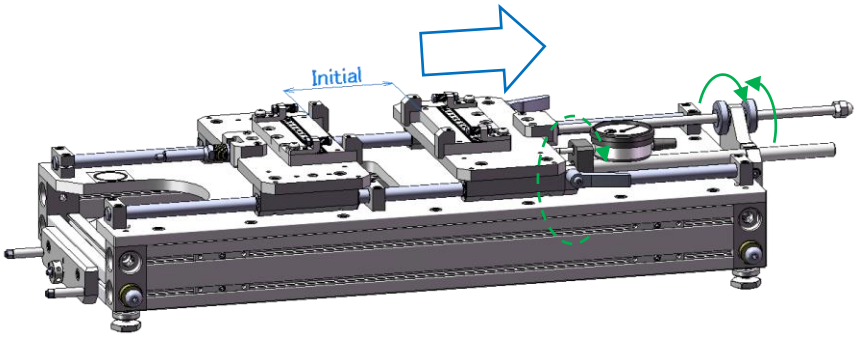
1) SET reciprocation distance to ±'stretching length ÷2', then move it to the full-forward.



2) MOVE the fixed slider to make distance between clamps as initial sample length, then fix it.

NOTE Use levers to fix the fixed slider position when the jig does not have the minute adjuster.

NOTE Change testing conditions or driving unit if fixed slider cannot be moved to target position.



3) SET reciprocation speed.

NOTE Refer to a manual of the driving unit for detail.

3.4 Setting Sample

Instructions video

QR

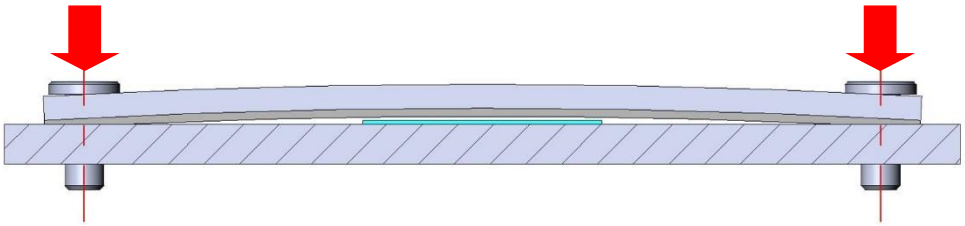
Tools: Allen wrench (3mm)

1) PUT a sample on clamp bases.

2) Hold the sample with clamping bars.

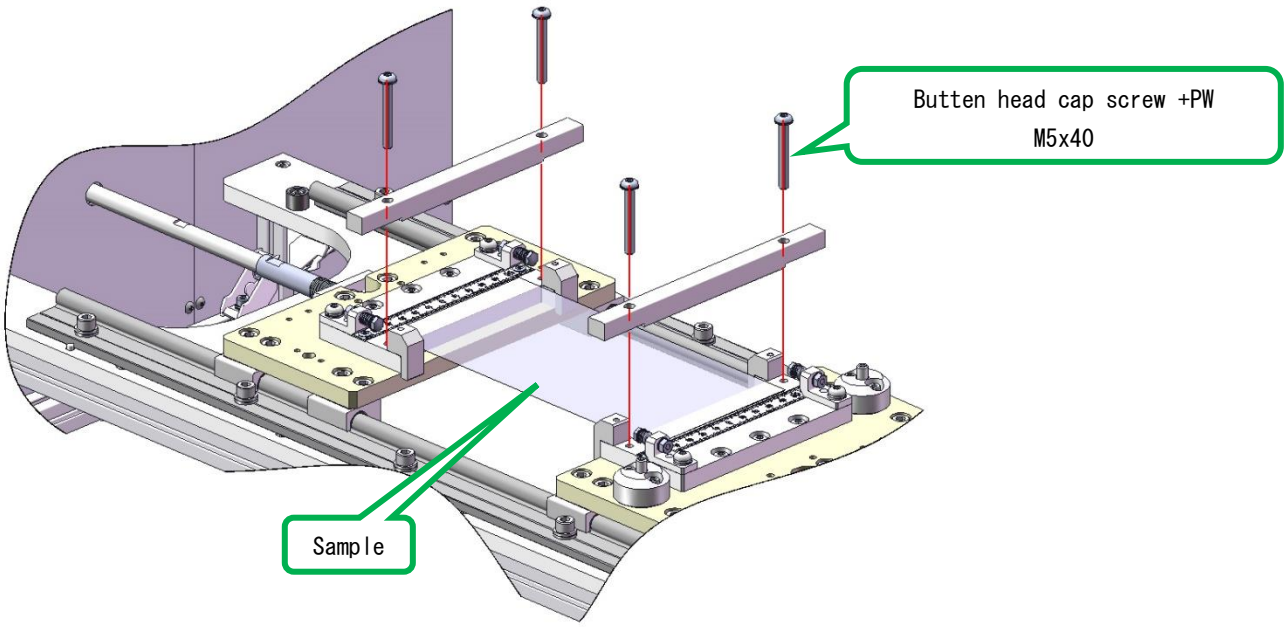
NOTE Required tightening torque should be changed according to materials and structures of samples.

CAUTION Over tightening torque may deform a clamping bar. The curved bar may not be able to hold a sample.



NOTE To prevent a clamping bar from deformation…

- Measure tightening torque with a torque wrench.
- Prepare stiffer bars.



NOTE The squashing gauges help to make clamping force uniform. Refer to video for detail.

NOTE The minute adjuster helps to set initial length especially if a soft and thick sample pressed out from clamping bars. Refer to video for detail.

3.5 Maintenance

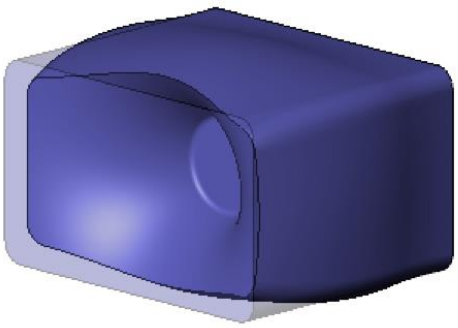
No.	INSPECTION	CYCLE	RESULT
1	Is not noise generated?	Daily	OK / NG

4. Pushing [+ET250020A0001]

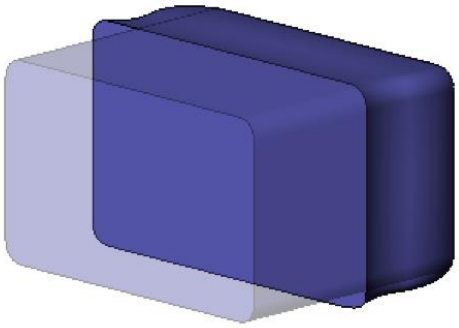
Modules repeatedly push a sample.

Only when the jig is driven by a numeric controlling unit like DMLHP, pushing amount can be changed even during running a test.

Deformation profile example [pushing amount: 20mm]

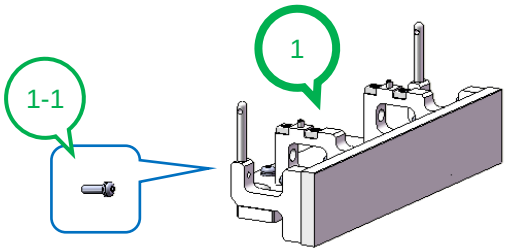


Pushing with a cylinder



Pushing with a wall

4.1 Testing Modules (representative example)



No.	NAME	TYPE	Num.	MANUFACTURE (MATERIAL)
1	**Wall module**	**ET250020A0001**	**2**	**YUASA SYSTEM**
1-1	Cap screw +SW +PW	M5x20	4	(Stainless steel)

NOTE Refer to each specification sheet for parts with different materials and/or shapes.

NOTE Please contact to sales or agent if something extra parts or new designed options are necessary.

4.2 Assembling Testing Modules (Case of DMLHP)

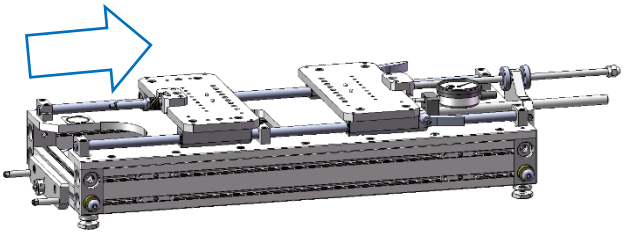
Instructions video

QR

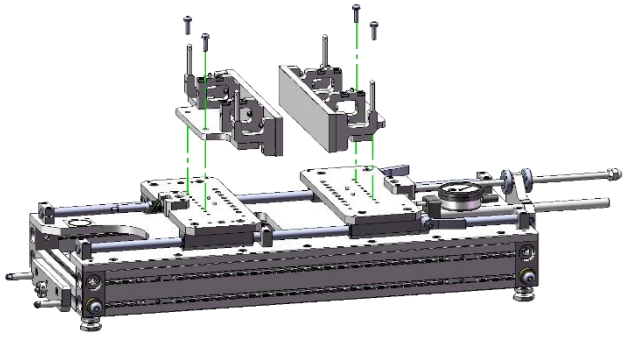
Tools: Allen wrench (3mm)

1) POSITION DMLHP to zero, then open the safety cover.

NOTE Case on DMLHB, set reciprocation distance to ±60 mm, then move it to the full-forward.

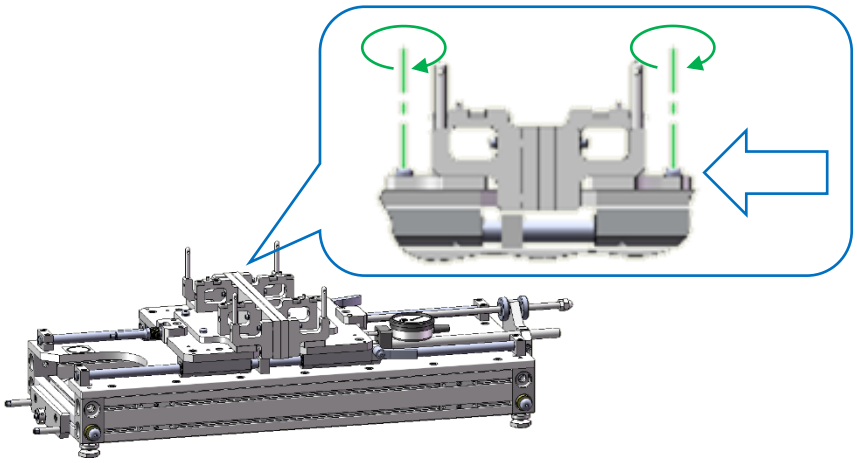


2) PUT wall modules on each “moving and fixed” slider.



3) MOVE the fixed slider to touch a wall module against another one, then fix them.

CAUTION Tightening torque: 3.0 N·m (do not over tighten screws) [Tool: Allen wrench (3mm)]



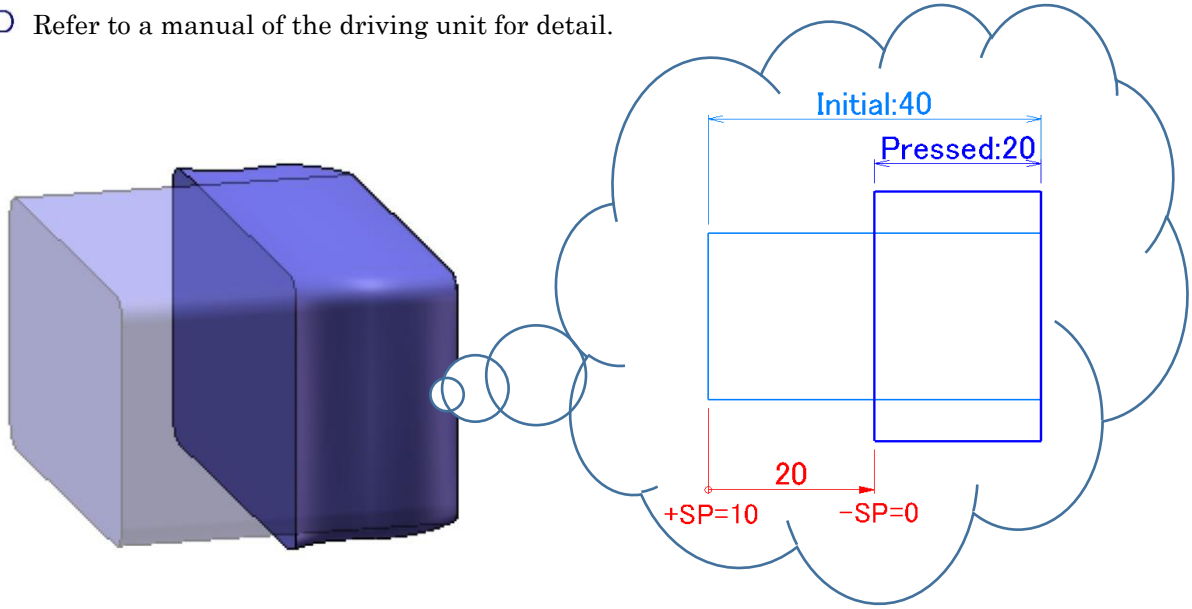
4.3 Setting Testing Conditions

Recommend setting testing condition after setting a sample. Refer to [4.4 Setting Sample] for detail.

1) Set position into '+SP' and '-SP'.

- In case of pushing amount will be changed during testing, '+SP' should be set to maximum pushing amount.
- In case of a pusher (a wall) should be depart from a sample, '+SP' should be set to larger than pushing amount.
- '-SP' should be set to 'zero'.
- In case of pushing amount will be changed during testing, adjust that with '-SP'.

NOTE Refer to a manual of the driving unit for detail.



2) SET reciprocation speed.

NOTE Refer to a manual of the driving unit for detail.

4.4 Setting Sample

・Based on a pushed sample (Based on Full-forward)

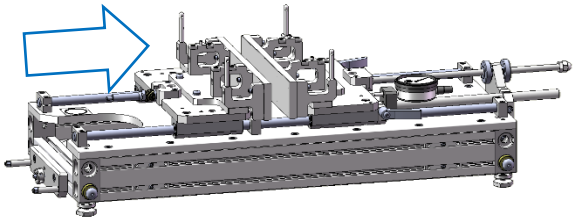
Instructions video

QR

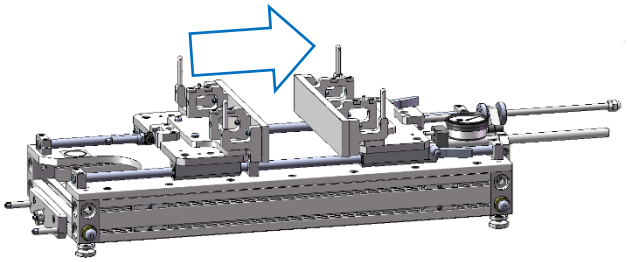
Tools: Allen wrench (3mm)

1) POSITION the moving slider to its full-forward.

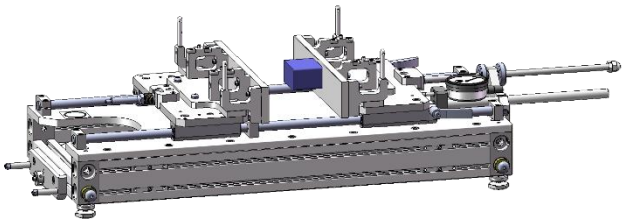
NOTE Full-forward means '-SP' on DMLHP.



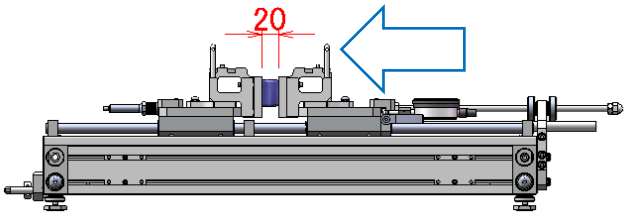
2) MOVE the fixed slider to make enough working space.



3) SET a sample on a wall module on the fixed slider.

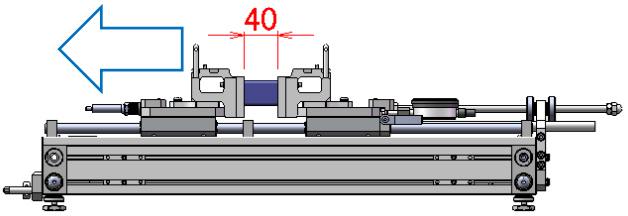


4) MOVE the fixed slider to push a sample as target pushing amount, then fix its position.



5) POSITION the moving slider to its rearmost.

NOTE Rearmost means '+SP' on DMLHP.



・Based on an initial position (Based on Rearmost)

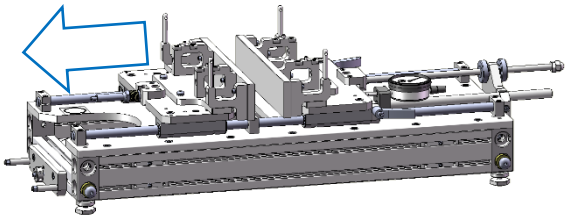
Instructions video

QR

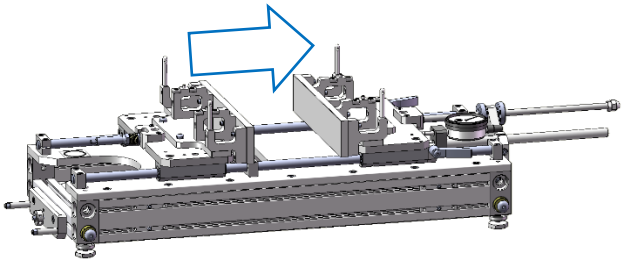
Tools: Allen wrench (3mm)

1) POSITION the moving slider to its rearmost.

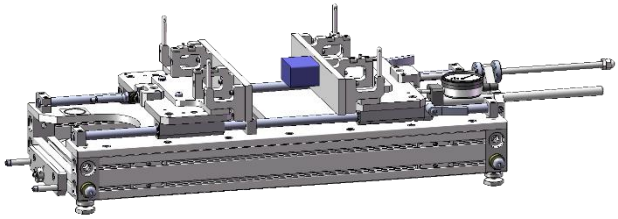
NOTE Rearmost means '+SP' on DMLHP.



2) MOVE the fixed slider to make enough working space.

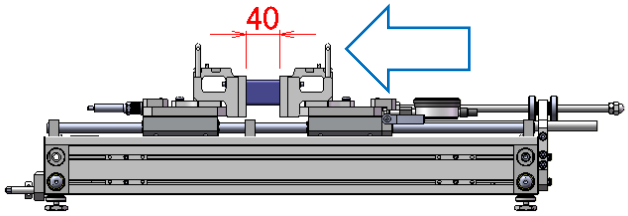


3) SET a sample on a wall module on the fixed slider.



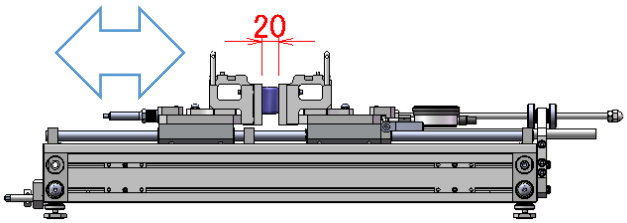
4) MOVE the fixed slider to touch a sample against opposite wall or to make a target gap between a sample and the wall, then fix its position.

NOTE Use levers to fix the fixed slider position when the jig does not have the minute adjuster.



5) PUSH a sample once to confirm pushing amount if necessary.

NOTE Pushing amount become maximum where '-SP' on DMLHP or 'full-forward' on DMLHB.



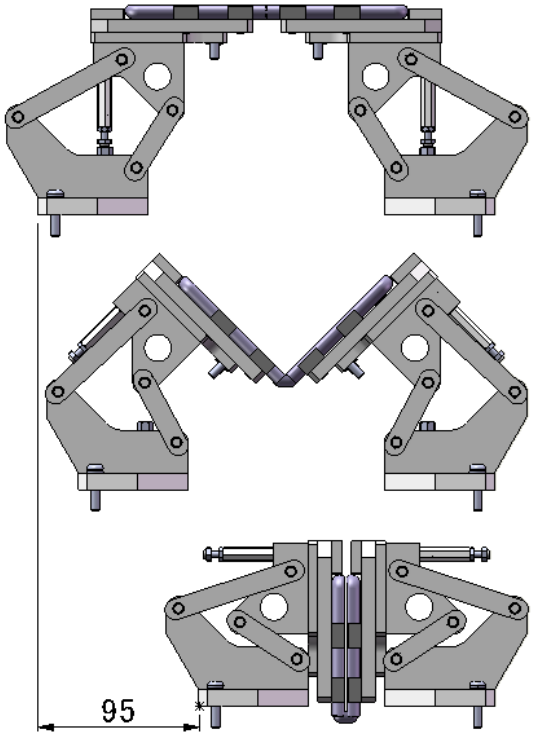
4.5 Maintenance

No.	INSPECTION	CYCLE	RESULT
1	Is not noise generated?	Daily	OK / NG
2	Is there any damage to each wall?	Every before Testing	OK / NG

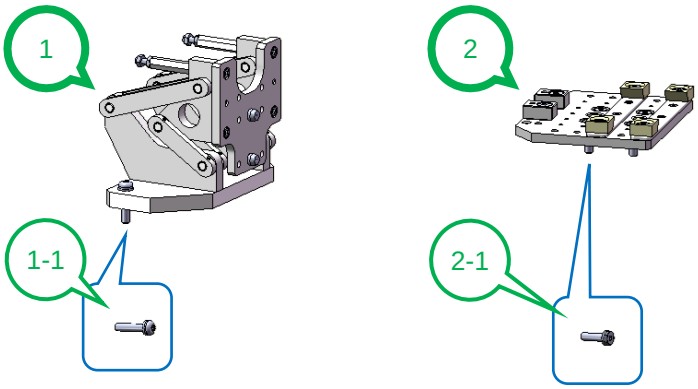
5. Foldable Devices [+ET250101A0002+ET250102A0004]

Modules repeatedly close and open a foldable devise.
Modules never deform a sample which does not have hinge structures, such as cables and films.
Modules are designed to be driven by numerical controlling system such as DMLHP.

Deformation profile example



5.1 Testing Modules (representative example)



No.	NAME	TYPE	Num.	MANUFACTURE (MATERIAL)
1	**Link module**	**ET250101A0002**	**2**	**YUASA SYSTEM**
1-1	Button head cap screw +SW +PW	M5x25	4	(Stainless steel)
2	**Holder module**	**ET250102A0004**	**2**	**YUASA SYSTEM**
2-1	Extra low head cap screw +SW +PW	CBSTS5-20	8	MISUMI (Stainless steel)

NOTE Refer to each specification sheet for parts with different materials and/or shapes.

NOTE Please contact to sales or agent if something extra parts or new designed options are necessary.

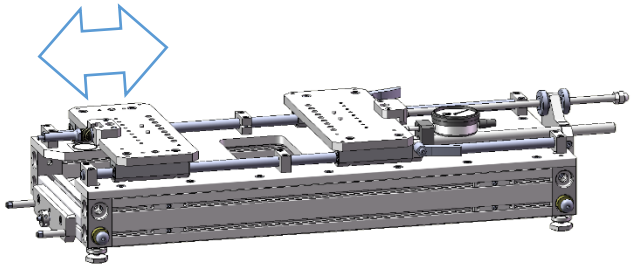
5.2 Assembling Testing Modules (Case of DMLHP)

Instructions video

QR

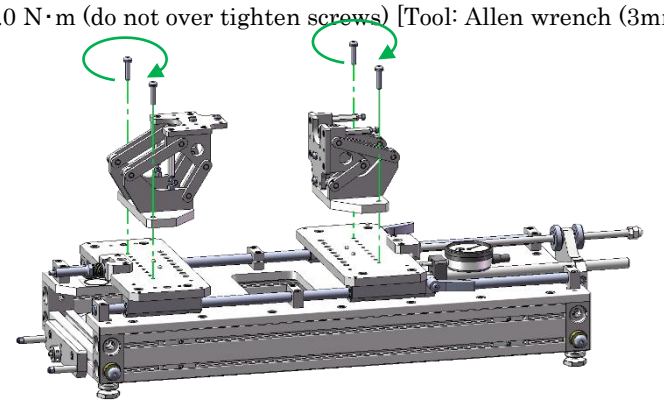
Tools: Allen wrench (3mm)

1) POSITION DMLHP to '100', then open the safety cover.



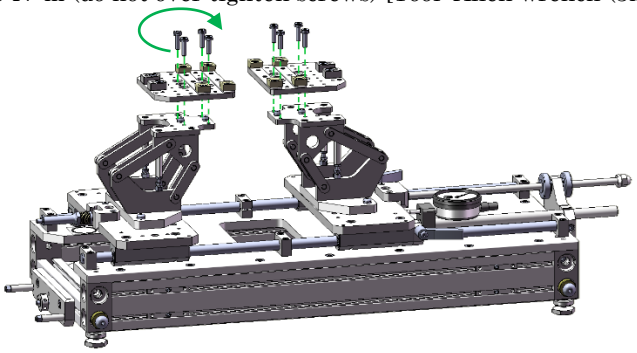
2) MOUNT a link-module on both 'moving and fixed' sliders.

CAUTION Tightening torque: 3.0 N·m (do not over tighten screws) [Tool: Allen wrench (3mm)]



3) MOUNT holder modules on both link-modules.

CAUTION Tightening torque: 3.0 N·m (do not over tighten screws) [Tool: Allen wrench (3mm)]



5.3 Setting Sample

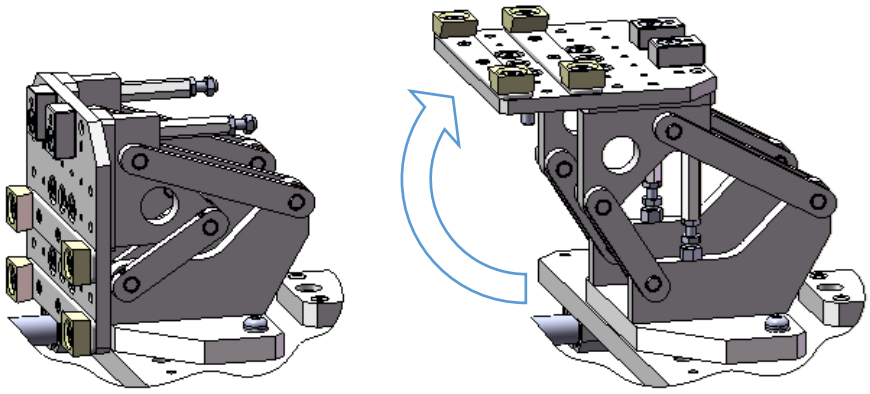
Instructions video

QR

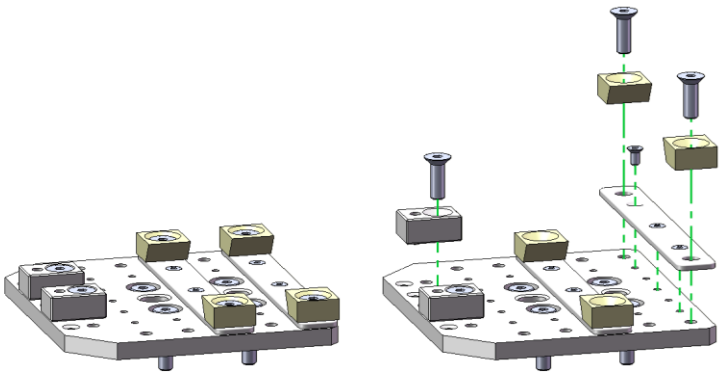
Tools: Allen wrench (3mm)

1) LIFT holder modules up to make them parallel.

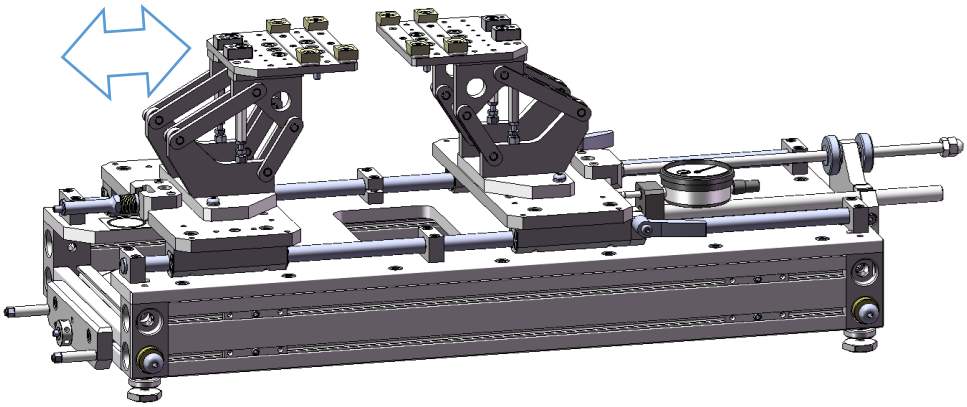
CAUTION Make sure that do not squash any fingers with links.



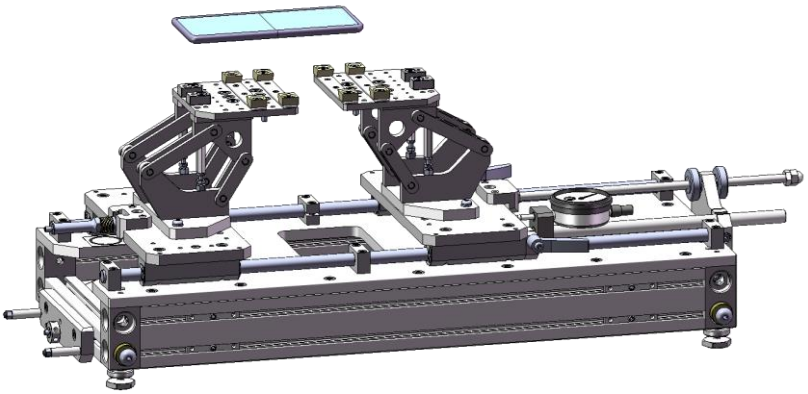
2) CHOOSE and MOUNT stoppers, spacers, and holders according to a sample structure.



3) SET '+SP' to '100' then POSITION the moving slider to there.

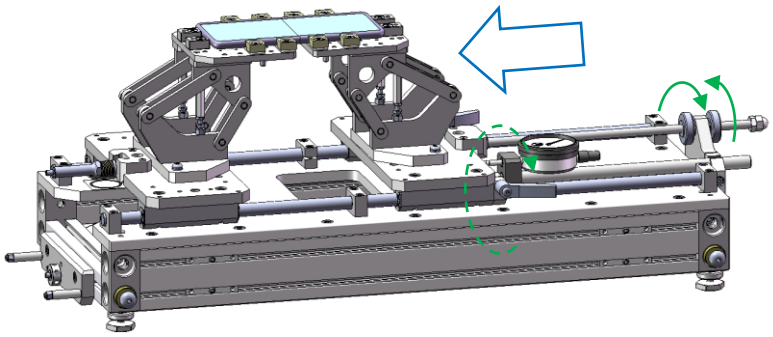


4) Temporarily MOUNT a sample on a holder on the moving slider.



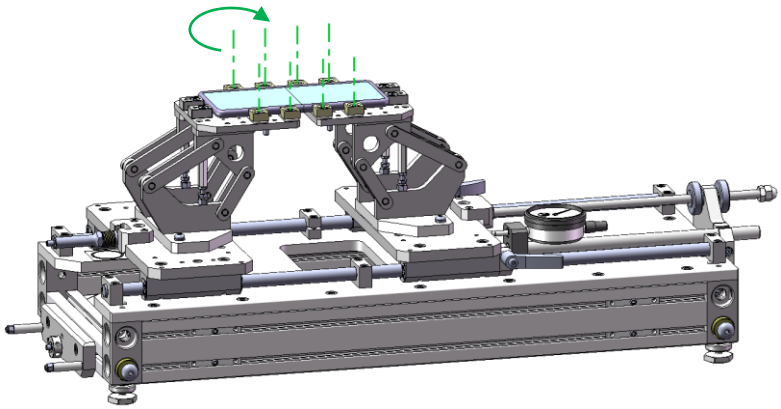
5) MOVE the fixed slider to touch a sample against all stoppers, then fix its position.

NOTE Use levers to fix the fixed slider position when the jig does not have the minute adjuster.



6) FIX the sample with holders.

NOTE Required tightening torque should be changed according to materials and structures of samples and holders.



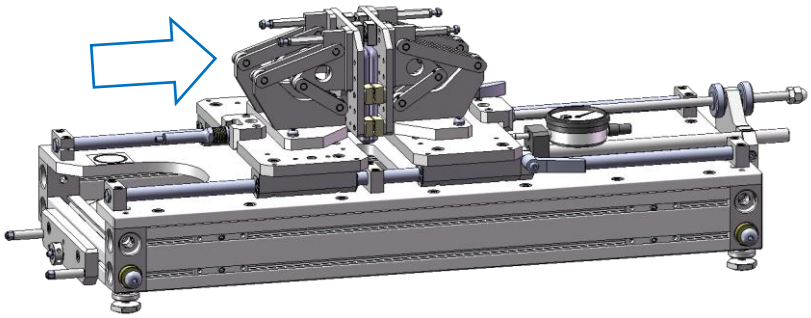
5.4 Setting Testing Conditions

Instructions video

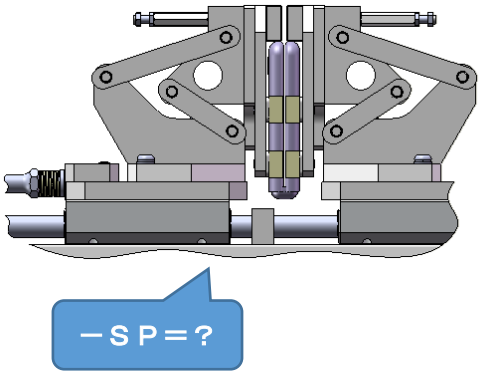
QR

Tools: Allen wrench (3mm)

1) Slowly MOVE the moving slider by JOG button to confirm where a sample will be closed.



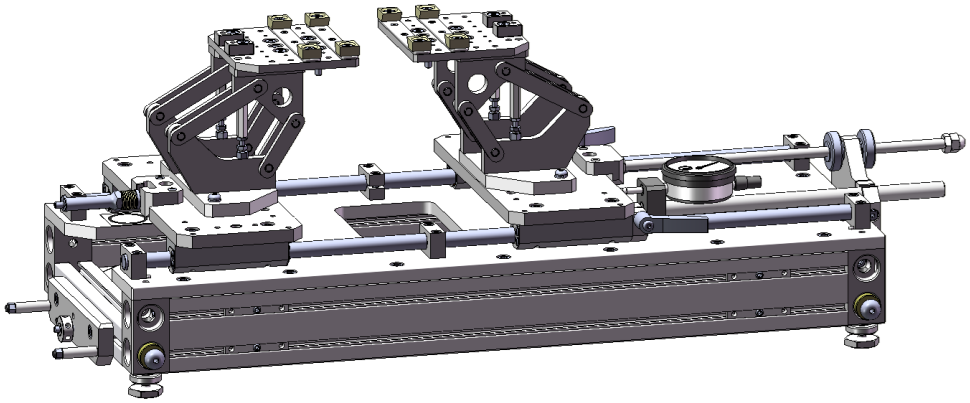
2) SET '-SP' to 'current position'.



3) SET reciprocation speed.

NOTE Refer to a manual of the driving unit for detail.

5.5 Maintenance



No.	INSPECTION	CYCLE	RESULT
1	Is not noise generated?	Daily	OK / NG
2	Is there any damage to each part?	Every before testing	OK / NG

～ Further Improve Reliability

YUASA SYSTEM CO., LTD.

http://www.yuasa-system.jp ～

HEAD OFFICE / FACTORY: 2292-1, Kibitsu, Kita-ku, Okayama-shi, OKAYAMA 701-1341, JAPAN

TOKYO OFFICE: 3F, Shimbashi SN BLDG, 5-7-10, Shimbashi, Minato-ku,
TOKYO 105-0004, JAPAN

OSAKA OFFICE: 8F, NLC Shin-Osaka Earth-BLDG, 5-1-3, Miyahara, Yodogawa-ku, Osaka-shi,
OSAKA 532-0003, JAPAN

Tel. 086-287-9030 / Fax. 086-287-2298 (VoIP Phone)

CUSTOMER SERVICES: 3204, Tomiyoshi, Kita-ku, Okayama-shi, OKAYAMA 701-1133, JAPAN
customerservice@yuasa-system.jp

The Contents of the instruction manual may change to improve without notice.
We make sure about the contents of this user manual.
However, please contact us if you have any questions or find any incorrect.