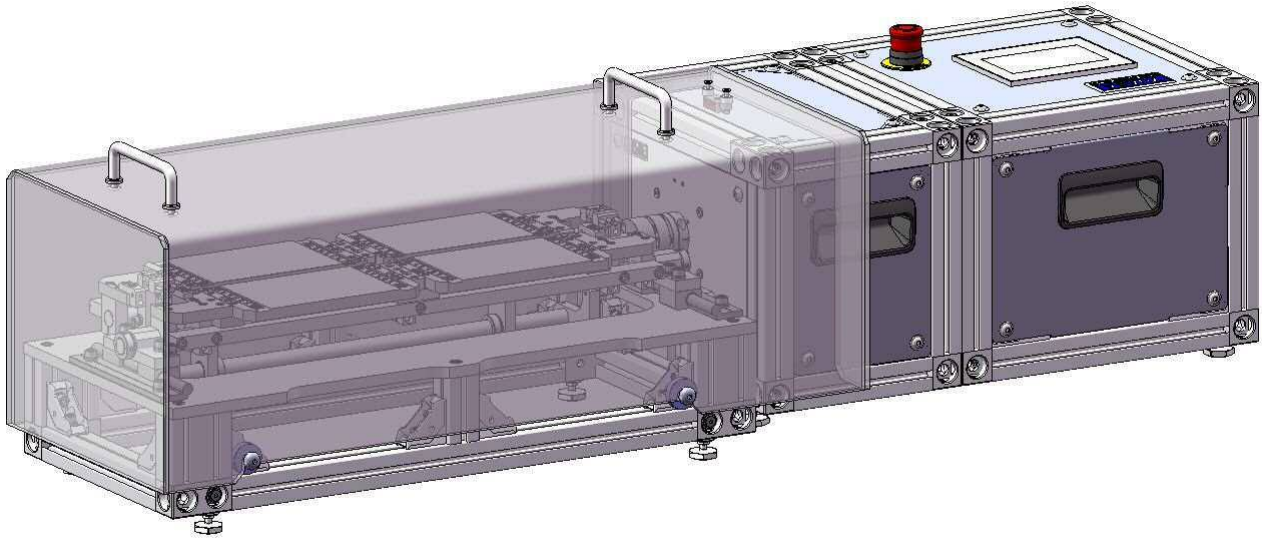
INSTRUCTION MANUAL
TENSION-FREE FOLDING
CLAMSHELL-TYPE

BF0102SR-DR11MR-M-1



YUASA SYSTEM CO., LTD.

Safety precaution 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 the 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 screws as described in this manual.
WARNING : Make sure the Emergency Stop Button is maked work, and the machine is completely stopped before adjust the testing condition and change the part.
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.

- CONTENTS -

1. INTRODUCTION
1.1 OVERVIEW ····· 1-1
1.2 STRUCTURE and COMPONENT ····· 1-1
1.3 INSTALLATION ····· 1-2

3. SETTING of TESTING CONDITON
3.1 FOLDING SPEED ····· 3-1
3.2 FOLDING RADIUS ····· 3-1
3.3 SAMPLE ····· 3-2
3.4 CARTRIDGE ····· 3-2
3.4.1 PUT OUT THE CARTRIDGE ····· 3-2
3.4.2 PUT ON THE CARTRIDGE ····· 3-2
3.5 SAFETY COVER ····· 3-3
3.5.1 ATTACH THE COVER on THE TESTING JIG ····· 3-3

4. MAINTENANCE and INSPECTION
4.1 INSPECTION ····· 4-1
4.1.1 PARTS LIST ····· 4-1

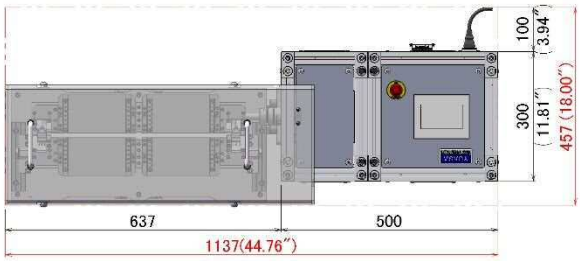
[- NOTICE -]

We make absolutely sure about the contents of this user manual.
However, if you have some questions or find some incorrect, please contact us.

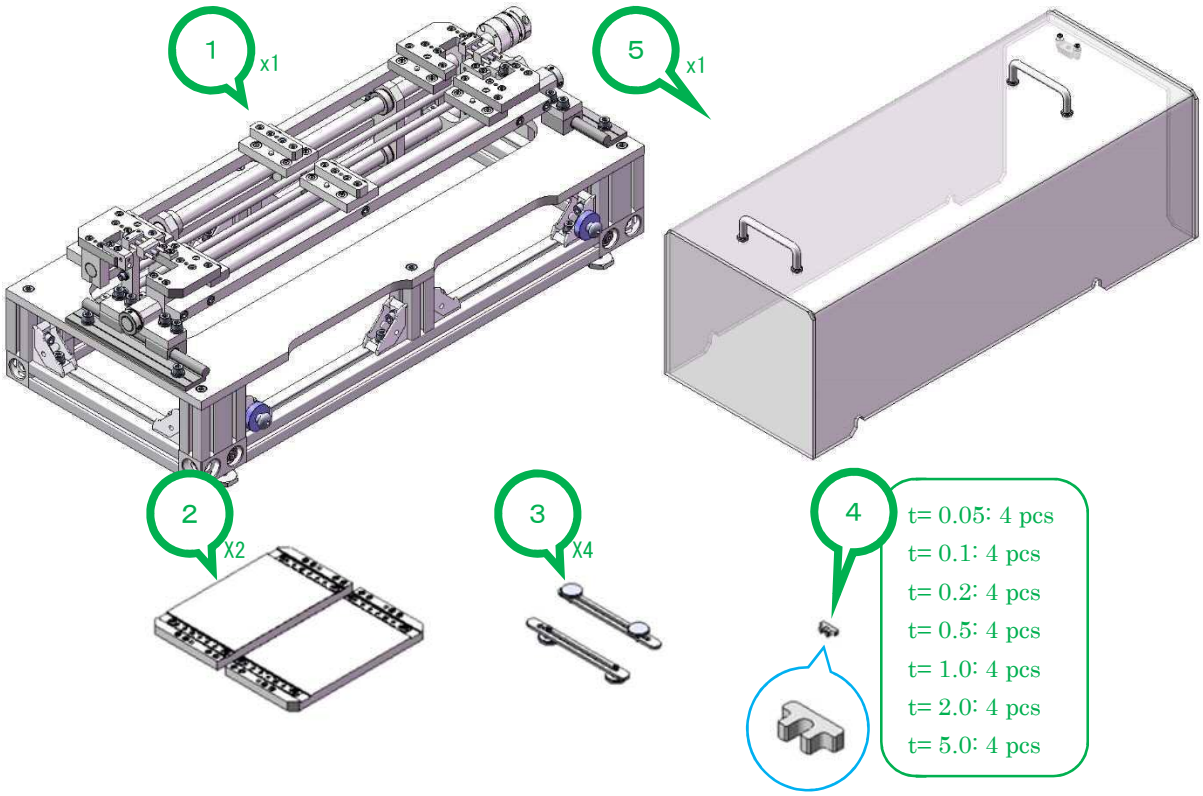
1. INTRODUCTION

1.1 OVERVIEW

Sample's size	Thicness : Max. 1 mm Width : Max. 130 mm × 2set Length : Min. π R+Clamping Space
Bending angle	180 °
Bending radius	0.5 ～ 5.0 mm
Bending force	Max. 0.7 N·m
Rec. Speed	Max. 360 deg/sec (About 60 rec/min)
(Driving Unit)	(DR11MR)
Mass	Driving Unit : About 20.0 kg (44.1 lb) Test Jig : About 12.5 kg (27.6 lb) Cartridge: About 1.0 kg (2.2 lb) Cover : About 3.5 kg (7.7 lb)
Installation Environment	Temp. : +5～+40 ° C (41～104 ° F) Humi. : 15～98%RH (No Condensation)



1.2 STRUCTURE and COMPONENTS

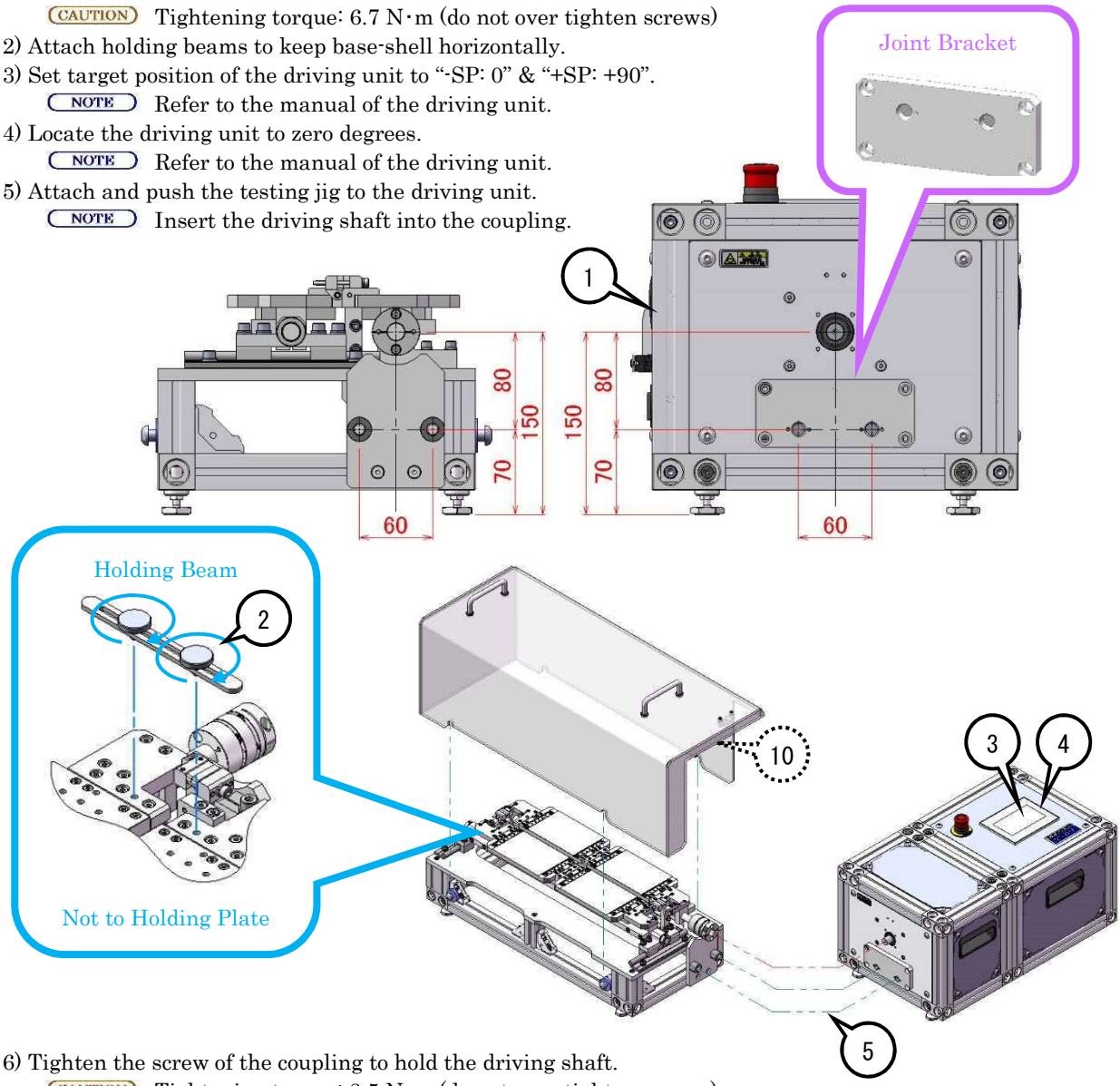


№	NAME	MANUFACTURE (MATERIAL)	NOTE
1	Basic unit	YUASA SYSTEM	
2	Holding plate	YUASA SYSTEM	For sample
3	Holding beam	YUASA SYSTEM	
4	Shim	YUASA SYSTEM	To set folding radius
5	Safety cover	YUASA SYSTEM	

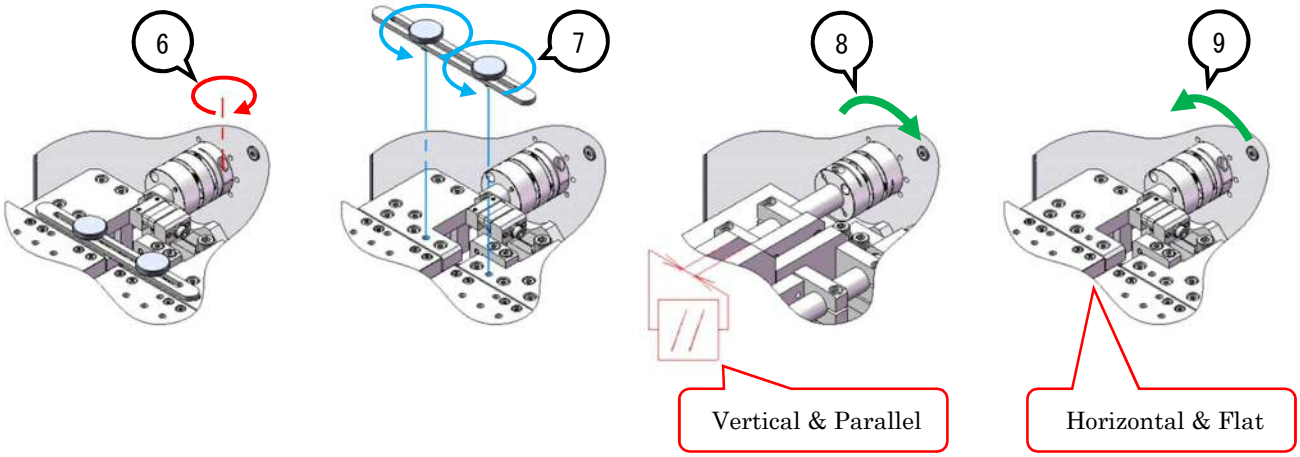
NOTE The Cartridge consist of holding-plates and holding-beams.

1.3 INSTALLATION [Tool: 3.0 mm Allen wrench]

1) Confirm that the joint bracket (ET209009A0001) has been attached to the driving unit.
   NOTE Cap screw M5x10 (4 pieces)
   CAUTION Tightening torque: 6.7 N·m (do not over tighten screws)
2) Attach holding beams to keep base-shell horizontally.
3) Set target position of the driving unit to "-SP: 0" & "+SP: +90".
   NOTE Refer to the manual of the driving unit.
4) Locate the driving unit to zero degrees.
   NOTE Refer to the manual of the driving unit.
5) Attach and push the testing jig to the driving unit.
   NOTE Insert the driving shaft into the coupling.



6) Tighten the screw of the coupling to hold the driving shaft.
   CAUTION Tightening torque: 3.5 N·m (do not over tighten screws)
7) Remove holding beams from the base-shell.
8) Locate the driving unit to +90 degrees to confirm a pair of holding plates will be parallel.
   NOTICE If a pair of holding plates are not parallel, change the target position "+SP".
9) Locate the driving unit to zero degrees again to confirm holding plates will be horizontally.
   NOTICE If a pair of holding plates are not horizontal, change the target position "-SP".
10) Attach the safety cover and operate them slowly to confirm they move smoothly.



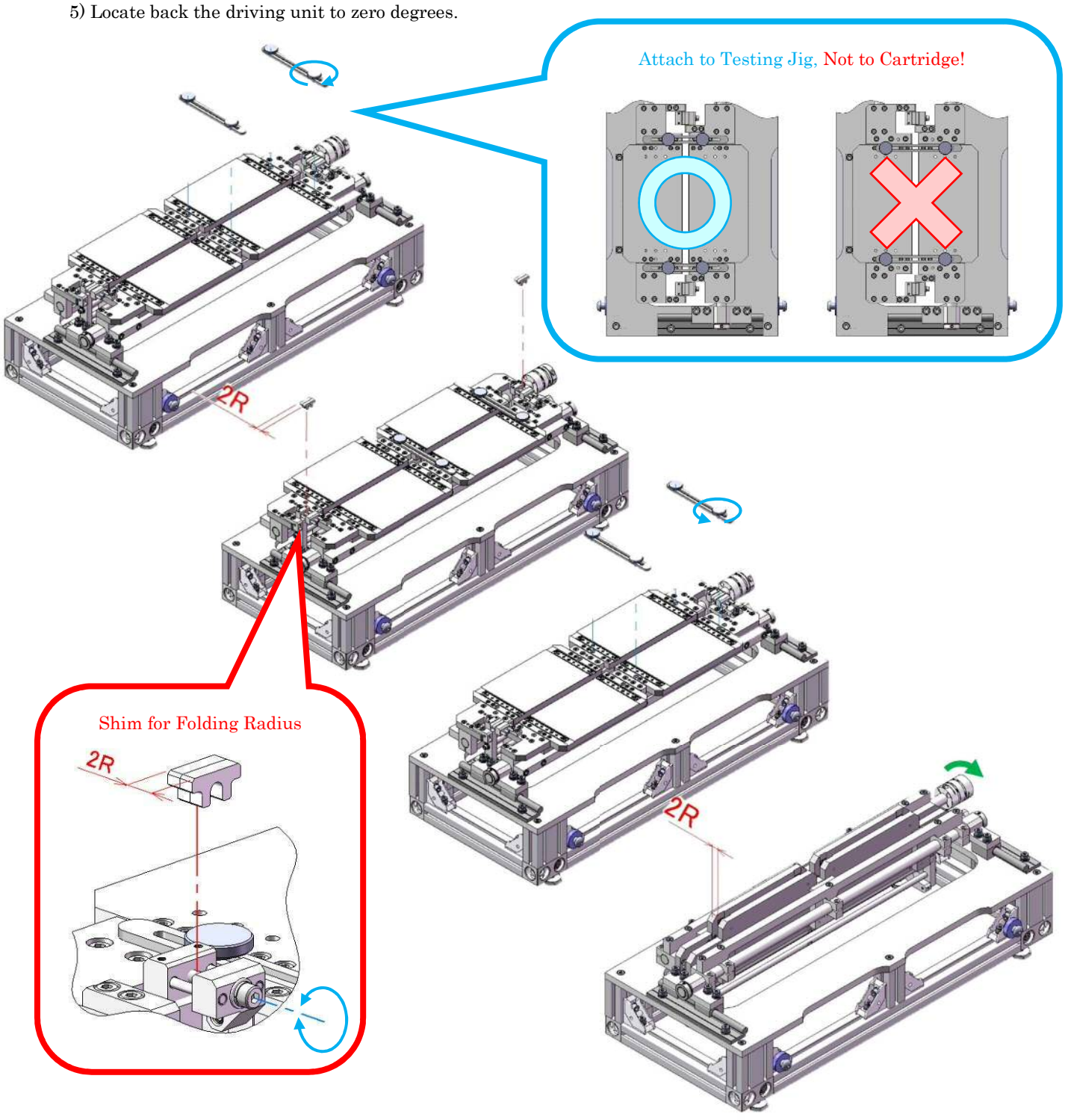
3. SETTING of TEST CONDITIONS

3.1 FOLDING SPEED [Tool: ---]

NOTE Refer to the manual of the driving unit.

3.2 FOLDING RADIUS [Tool: 3 mm Allen wrench]

1) Attach holding beams to hold the testing jig. Then loosen screws slightly so that the beam moves freely.
2) Loosen screws to remove shims. Then put some shims according to testing condition and hold them.
   NOTICE Half of total thickness of shims mean folding radius. (Total thickness: 2R)
   NOTICE Set surely same thickness shims into two places.
   CAUTION Tightening torque: 3.0 N·m (do not over tighten screws)
   CAUTION Do not set the folding radius less than 0.5 mm.
3) Remove holding beams.
4) Locate the driving unit to +90 degrees to confirm the distance between a pair of holding plates be shown 2R.
   NOTICE If the distance between a pair of holding plates not become 2R, back to the process 2).
5) Locate back the driving unit to zero degrees.



3.3 SAMPLE

1) Clean up holding plates.

2) Set the sample to holding plates with something adhesive tapes.

CAUTION Make sure that the sample never touch itself when it will be bent. The cartridge might detach and drop.

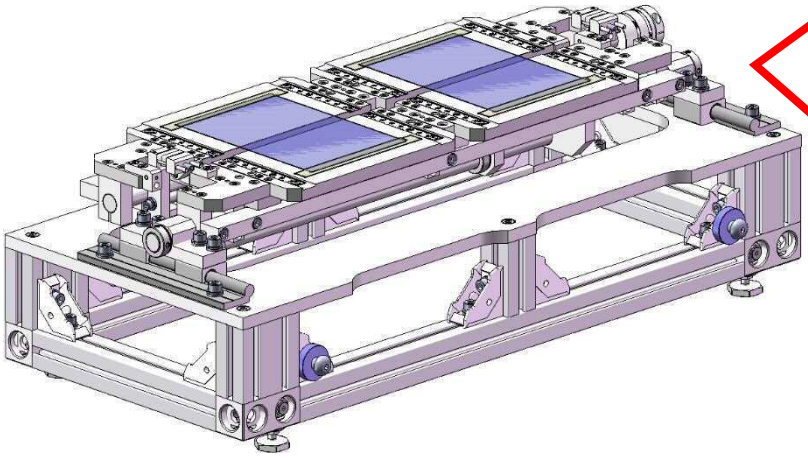
NOTE The huge force is not necessary to set the sample because the sample not will be subjected tension.

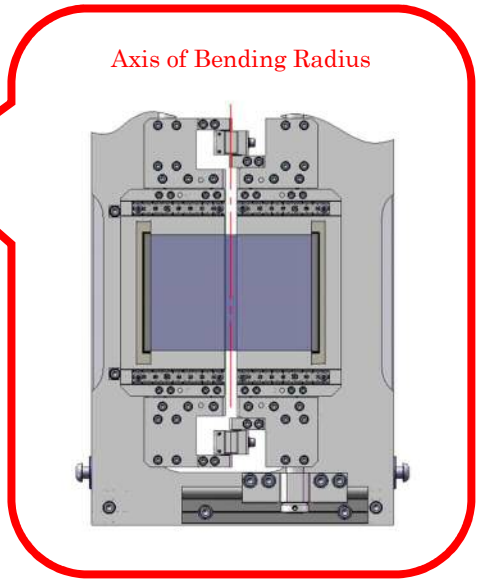
NOTICE The sample will be bent at center of a pair of holding plates.

NOTICE Adhesive should be made distance "(π R-2R)/2" from the edge of the holding-plate.

Ex. Bending radius: 5 mm

(π R-2R)/2 = (3.14x5-2x5)/2 = 2.85 mm





3.4 CARTRIDGE

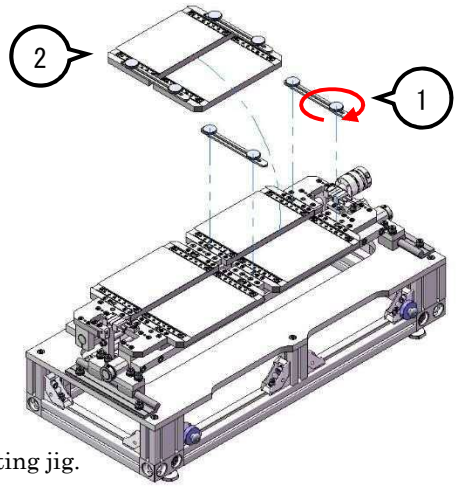
Can remove samples together with the test jig, the cartridge, and reset it to continue test.

- Observe samples with the micro-scope repeatedly until tested number will reach to the target number.
- Change the material of the cartridge according to the sample.
- Change the shape of the cartridge according to the sample
- Etcetera.

3.4.1 PUT OUT THE CARTRIDGE [TOOL: - - -]

1) Attach holding beams to holding plates.

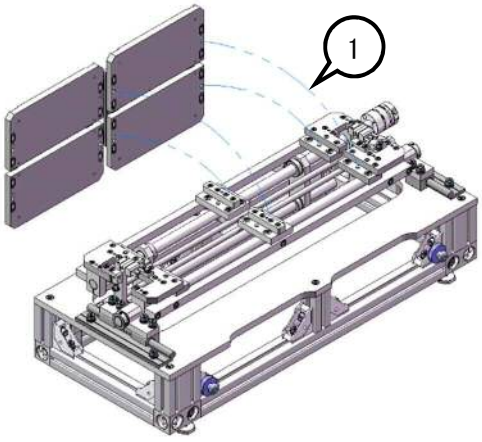
2) Lift up the cartridge.

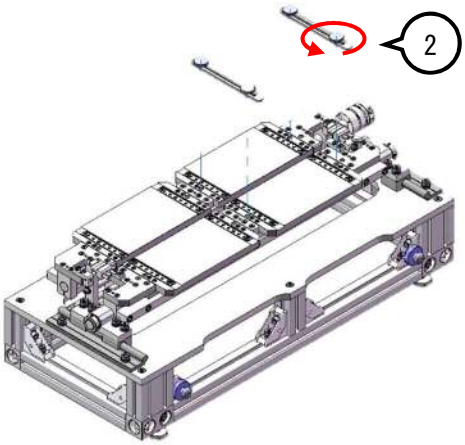


3.4.2 PUT ON THE CARTRIDGE [TOOL: - - -]

1) Locate the cartridge with dowel pins, and put it on the testing jig.

2) Remove holding beams.





3.5 Safety Cover

WARNING Install a safety cover and prevent access to any moving parts.

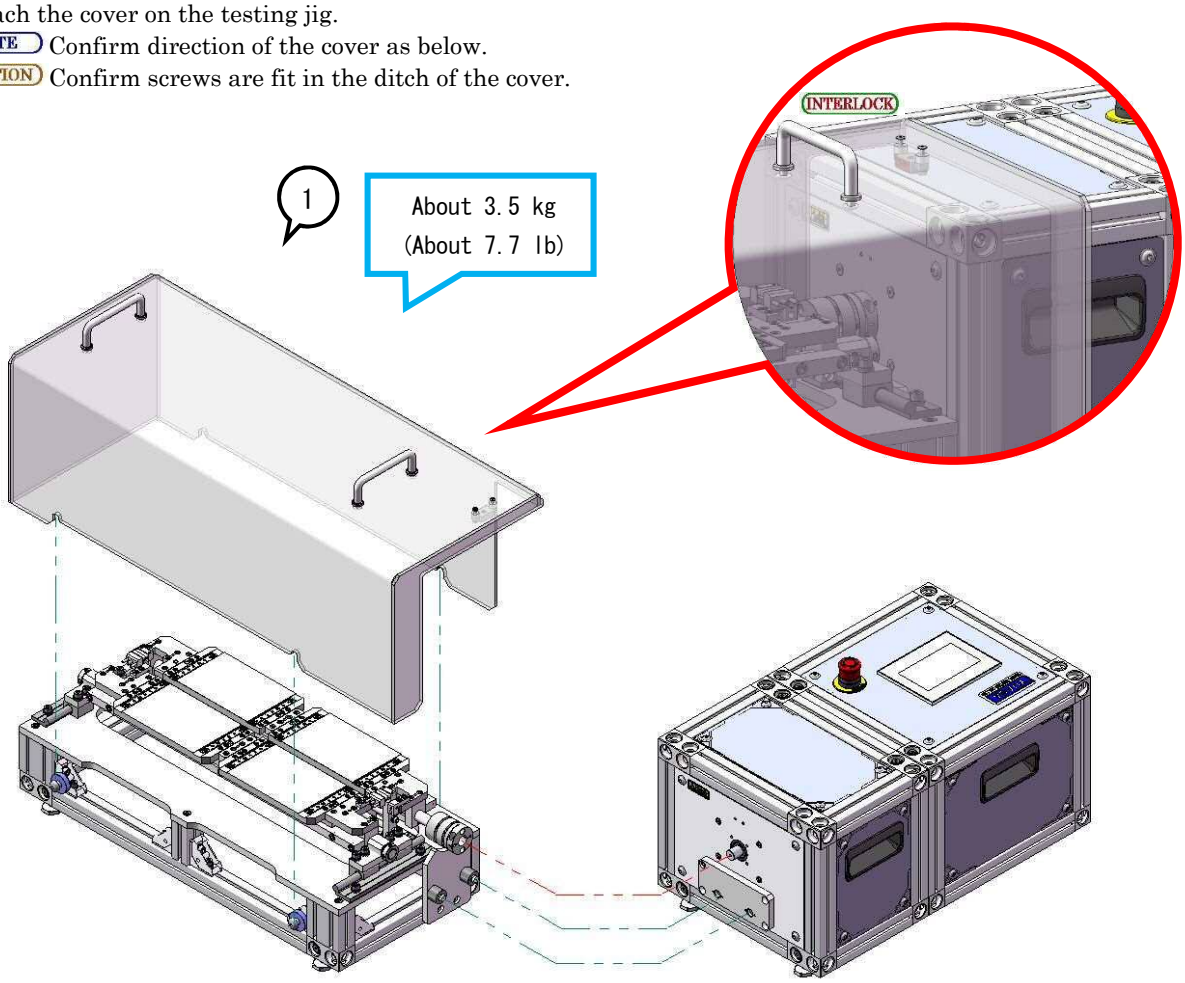
INTERLOCK Cannot operate equipment with the operation panel whenever the safety cover opened.

3.5.1 ATTACH THE COVER on THE TESTING JIG [Tool: ---]

1) Attach the cover on the testing jig.

NOTE Confirm direction of the cover as below.

CAUTION Confirm screws are fit in the ditch of the cover.



【MEMO】

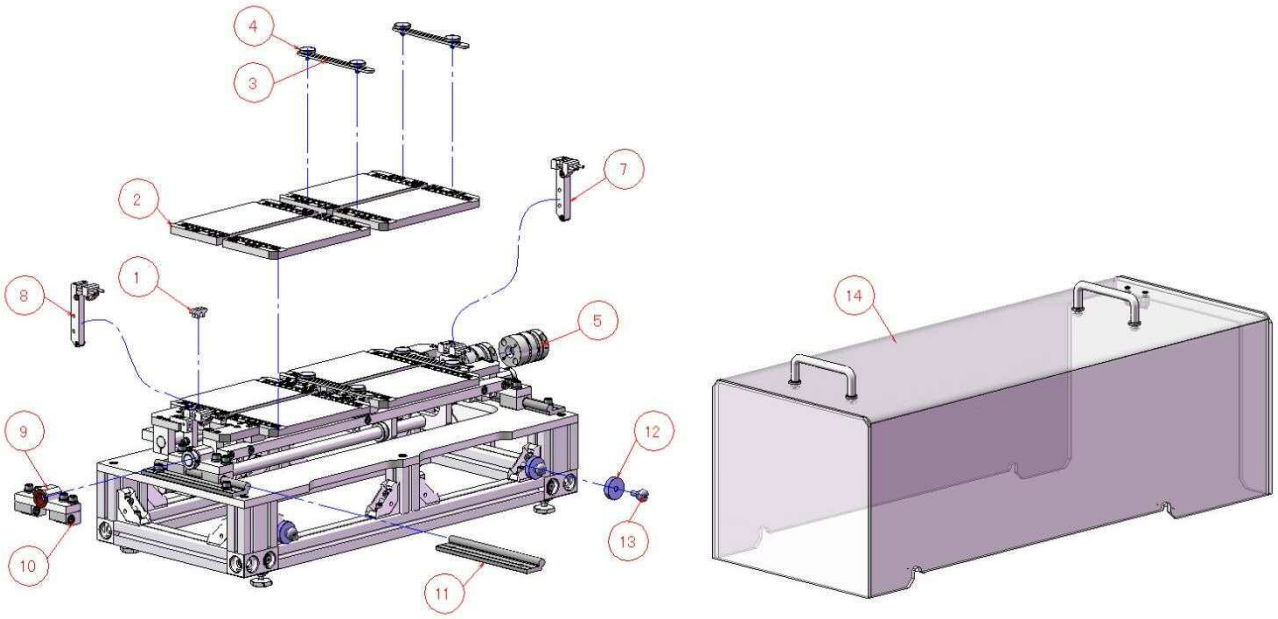
4. MAINTENANCE and INSPECTION

4.1 INSPECTION

This Jig is maintenance-free.

Change to the new one if some components will break because of using condition or aging.

4.1.1 PARTS LIST



№	NAME	TYPE	Num.	MANUFACTURE (MATERIAL)	NOTE
1	Shim set	ET264008A001	1	YUASA SYSTEM	No.1-1~1-7 included
1-1	Shim	YS001P0000021	*1	YUASA SYSTEM	t= 0.05 mm
1-2	Shim	YS001P0000022	*1	YUASA SYSTEM	t= 0.1 mm
1-3	Shim	YS001P0000023	*1	YUASA SYSTEM	t= 0.2 mm
1-4	Shim	YS001P0000024	*1	YUASA SYSTEM	t= 0.5 mm
1-5	Shim	YS001P0000025	*1	YUASA SYSTEM	t= 1.0 mm
1-6	Shim	YS001P0000026	*1	YUASA SYSTEM	t= 2.0 mm
1-7	Shim	YS001P0000027	*1	YUASA SYSTEM	t= 5.0 mm
2	Cartridge	ET264003A0001 (*2)	4	YUASA SYSTEM	No.3 included
(3)	Holding beam	YP000P0000099	4	YUASA SYSTEM	No.4 included
(4)	Cover screw	RNCB5-3-8	8	MISUMI	
5	Disk coupling	GCPW39-15-15	1	MISUMI	
6					
7	Parallel link	ET264005A0006	1	YUASA SYSTEM	
8	Parallel link	ET264005A0005	1	YUASA SYSTEM	
9	Slider	ET264007A0001	2	YUASA SYSTEM	No.10 included
(10)	Housing bearing	WJ200UM-01-10-AL	4	igus	
11	Single rail	WS-10-160	2	igus	
12	Resin washer	WSJM-D28-V6-T7	4	MISUMI	
13	Step screw	DBBS6-6-12	4	MISUMI	
14	Safety cover	ET503004A0012	1	YUASA SYSTEM	

NOTE *1: The number depends on testing condition.

NOTE *2: Can order a cartridge with other material, please contact the sales agent.

【MEMO】

~ Further Improve Reliability

YUASA

YUASA SYSTEM CO., LTD.

http://www.yuasa-system.jp ~

HEAD OFFICE / FACTORY: 2292-1, Kibitsu, Kita-ku, Okayama-shi, OKAYAMA 701-1341, JAPAN Tel. +81-86-287-9030 / Fax. +81-86-287-2298

TOKYO OFFICE: 3F, Shinbashi SN BLDG, 5-7-10, Shinmachi, Minato-ku, TOKYO 105-004, JAPAN Tel. +81-3-3578-8515 / Fax. +81-3-3578-8516

OSAKA OFFICE: 8F, NLC Shin-Osaka Earth-BLDG, 5-1-3, Miyahara, Yokogawa-ku, Osaka-shi, OSAKA 532-003, JAPAN Tel. +81-6-6394-8175 / Fax. +81-6-6397-2632