# - INSTRUCTION MANUAL -
# Endurance Testing System
# STRETCHING TESTER

YUASA
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.

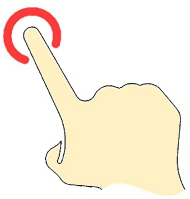
CAUTION : Immediately stop the machine upon any sign of abnormal operation.

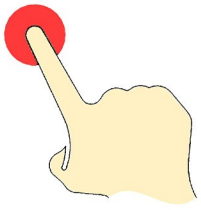
NOTICE : Make sure to tighten the screws as described in the manual.

NOTE : The scraps should be disposed as general waste by skilled professionals.

Icons on this manual.

◇Tap the touch panel display ◇Press the touch panel display





# - CONTENTS -



[- NOTICE -]

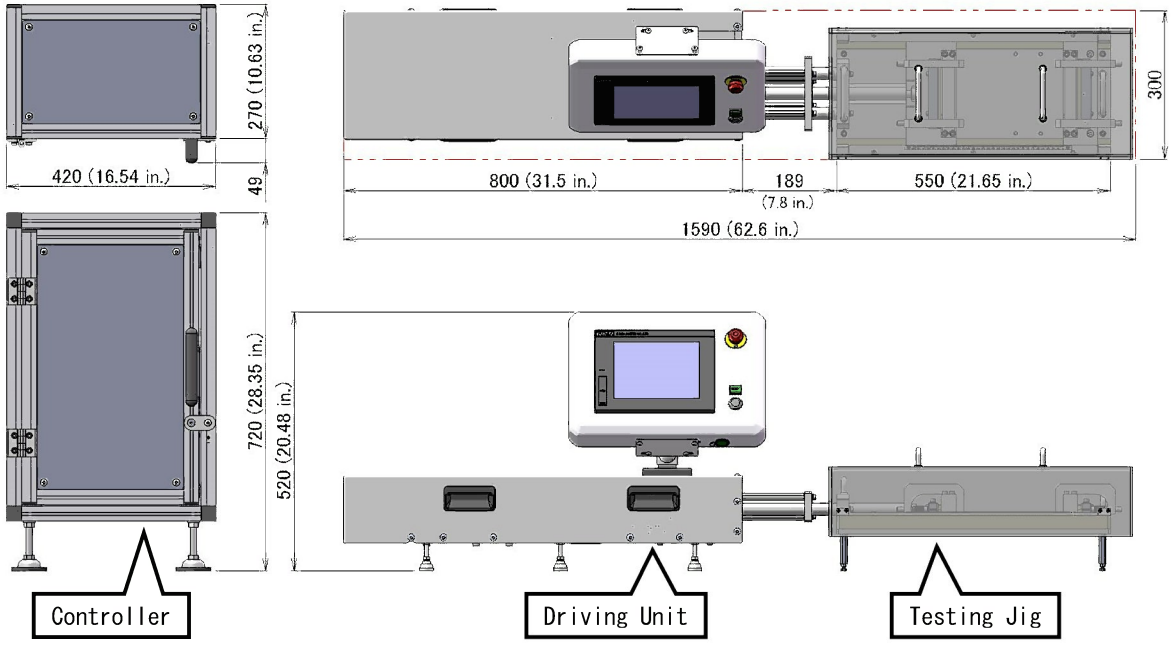
We make absolutely sure about the contents of this user manual.
However, if you have some questions or find some incorrect, please contact us.

# 1. GENERAL DESCRIPTION

## 1.1 UTILITY INFORMATION

| | |
|---|---|
| Electrical Information | 208/ 60 Hz / 3 Phases / 10 A |
| Ambient Environment | Temperature：+5～+40 ° C (41～104 ° F)<br>Humidity ：15～85 %RH (No Condensation) |
| Sound Level | Max. 80 dB |

## 1.2 OVERVIEW

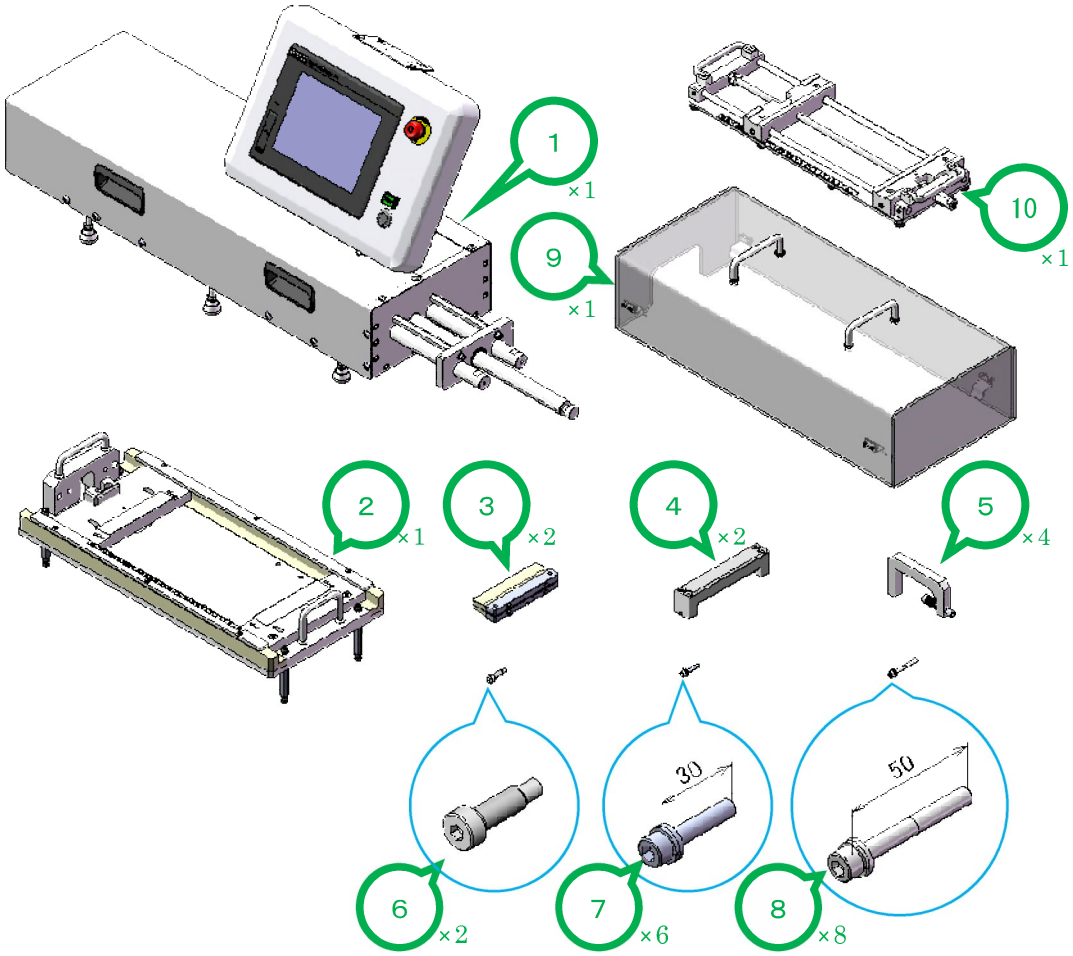



## 1.3 SPECIFICATIONS

CAUTION Function may be limited by kind of test jig or sample.

| | |
|---|---|
| Counter | 8-digits (with pre-set) |
| Stretching length | Max. 50 mm (in limited case, max. 100 mm) |
| Stretching speed | 1～120 mm/sec. |
| Stretching force | Max. 1500 N |
| Testing mode (target) | Constant length / Constant load |

## 1.4 CONPONENT




| № | NAME | TYPE | MANUFACTURE (MATERIAL) | NOTE |
|---|---|---|---|---|
| 1 | Driving unit | ET137A002-002 | YUASA SYSTEM | |
| 2 | Slider unit | ET256A002-001 | YUASA SYSTEM | |
| 3 | Wedge clamp | ET200P180-002 | YUASA SYSTEM | |
| 4 | Case | ET200P179-002 | YUASA SYSTEM | |
| 5 | Supporter | ET200P182-002 | YUASA SYSTEM | |
| 6 | Stripper bolt | SMSB8-20 | MISUMI | |
| 7 | Cap screw + Washer | M6x30 | (Stainless steel) | |
| 8 | Cap screw + Washer | M6x50 | (Stainless steel) | |
| 9 | Cover | ET500A003-035 | YUASA SYSTEM | |
| 10 | Setting jig | ET257A001-001 | YUASA SYSTEM | |

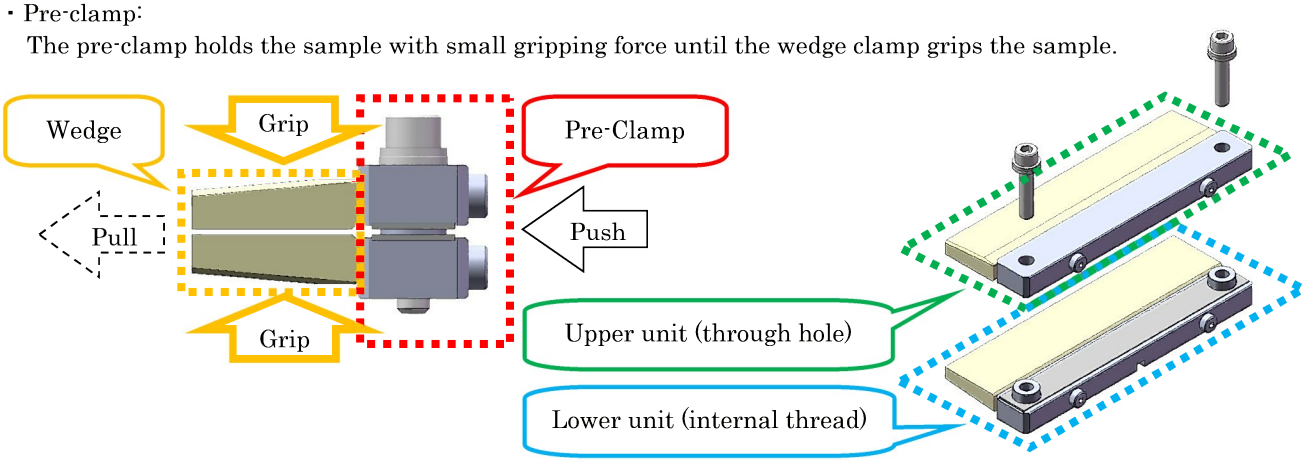
* Explain words in this instruction manual

・Wedge clamp:

The clamp grips the sample with wedge effect, huge gripping force. It's consist of wedges and the pre-clamp.

・Pre-clamp:

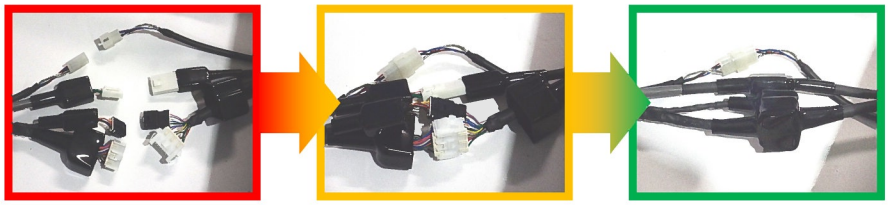
The pre-clamp holds the sample with small gripping force until the wedge clamp grips the sample.



## 1.5 INSTALLATION [Tool : 5mm Hexagon bar wrench]

1) Set the driving unit on the testing rack.

2) Connect four connectors.



3) Boot up the system (refer to 2.1 BOOT UP).

NOTE Do not press “READY” button.

4) Select the “MAINTENANCE” view.

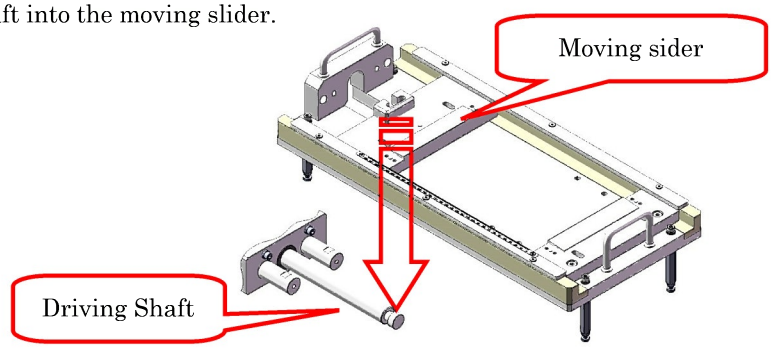
5) Tap the “ABSOLUTE RESET” button to stop an error (F060: SCON Error “CODE: 00EE” ).

6) Press the “READY” button.

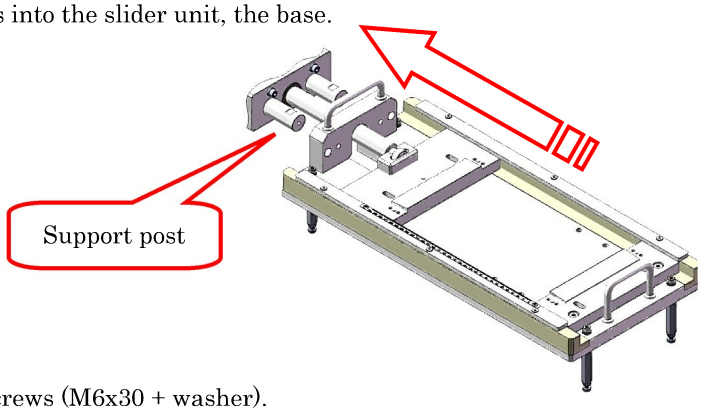
7) Tap the “ORIGIN SEARCH” button to reset the origin position.

8) Press the “<<JOG” button one second, then press the “JOG>>” button to move the driving shaft to origin position.

9) Put the testing jig to insert the driving shaft into the moving slider.

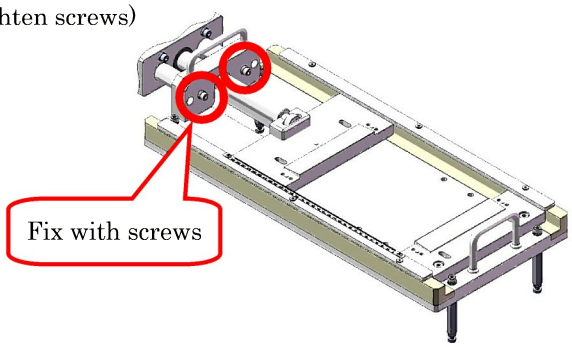



10) Push the testing jig to insert support posts into the slider unit, the base.




11) Fix the slider unit to support posts with screws (M6x30 + washer).

CAUTION Tightening torque: 12 N·m (do not over tighten screws)



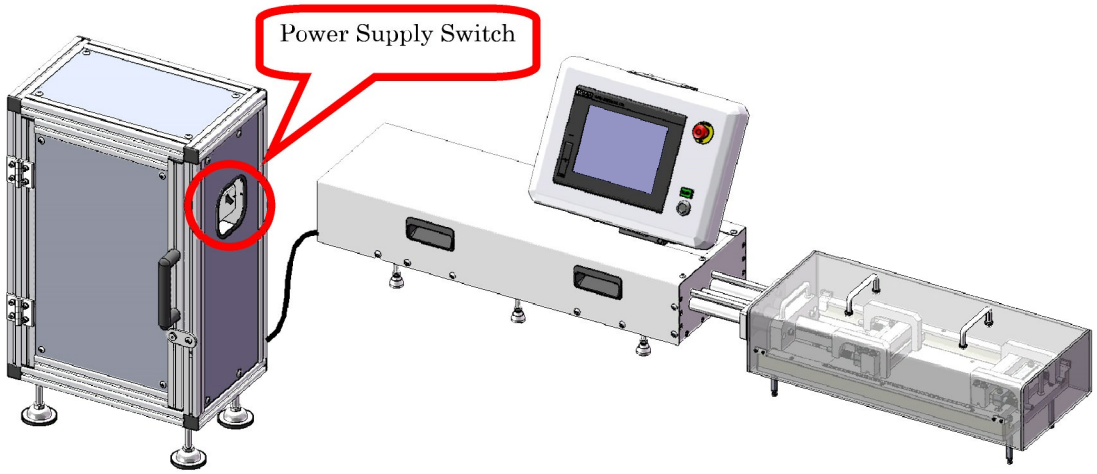
# 2. OPERATING INSTRUCTION

## 2.1 BOOT UP

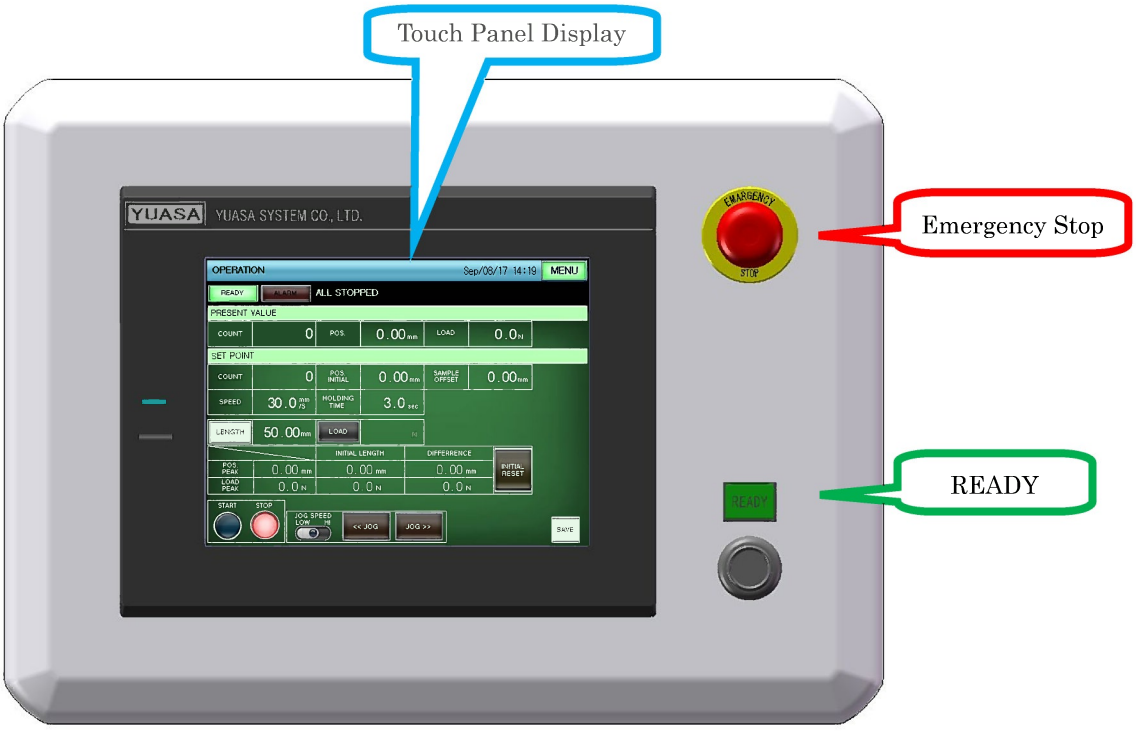
1) Connect power cable (inlet) to outlet.
   WARNING Ground an earth wire for safety.
2) Turn on the power supply switch.
   NOTE The tester boots up automatically when electricity supplied.
3) The “PASSWORD” screen boot up.

## 2.2 SHUT DOWN

1) Make sure that the driving unit stop.
2) Turn OFF the power supply switch.
   NOTE There is no procedure of shut down.




## 2.3 OPERATION PANEL

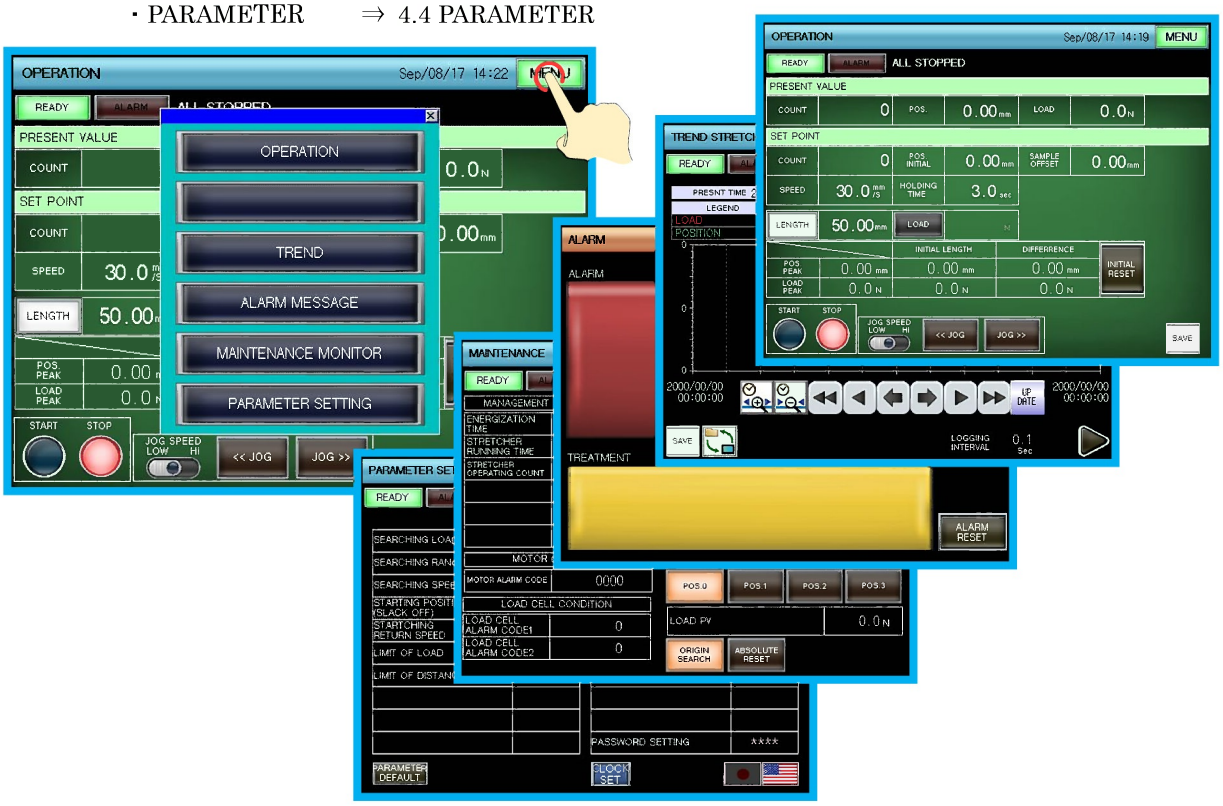


## 2.4 TOUCH PANEL DISPLAY

### 2.4.1 MENU

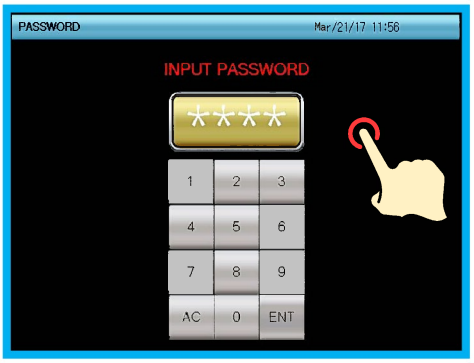
Tap the “MENU” button to select the view. The “MENU” will be shown on the screen.

- OPERATION ⇒ 3. SETTING and OPERATION
- TREND ⇒ 3.7 TREND (LOG)
- ALARM MESSAGE ⇒ 4.2 ERROR MESSAGE and CORRECTIVE ACTION
- MAINTENANCE ⇒ 4.3 TROUBLESHOOTING
  - PARAMETER ⇒ 4.4 PARAMETER



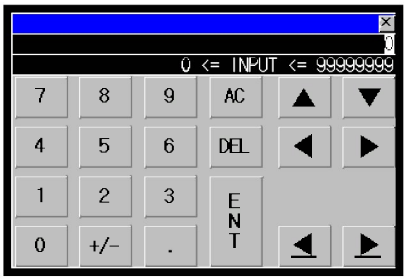

### 2.4.2 SLEEP MODE

The screen turn black when nobody touch the screen for 20 minutes.
Touch and input password, the screen will turn back from black view. (Default: 1234)




### 2.4.3 NUMERIC DISPLAY

Tap the each set-point, the numeric display pop up on the screen.
Enter the set-point value and tap the “ENT” button.



## 3. SETTING and OPERATION

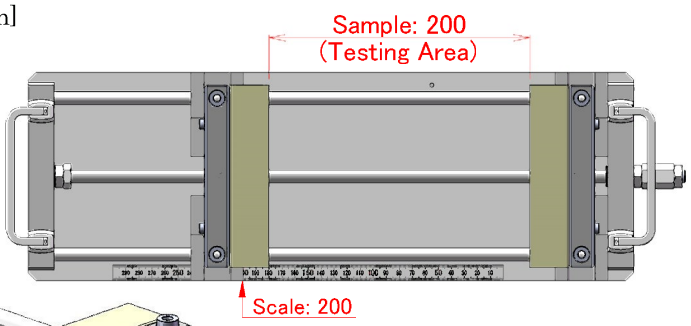
Can conduct test in various modes and conditions.

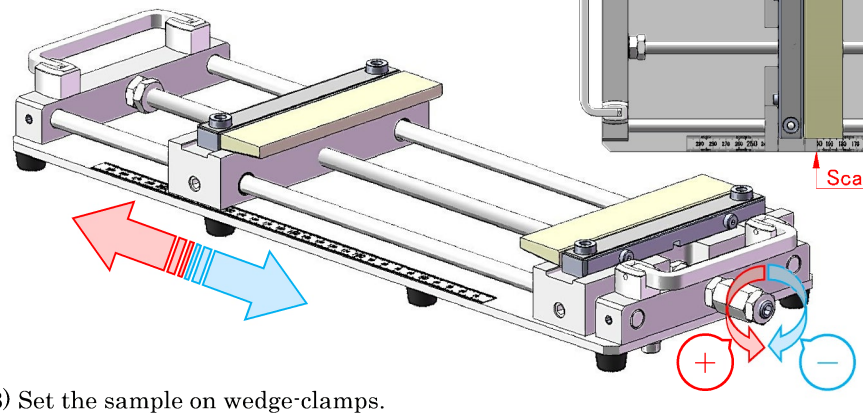
The endurance testing system counts the movement number in every 1 reciprocation.

### 3.1 SETTING (SAMPLE) [Tool : 5mm allen wrench]

1) Put wedge-clamps (lower units) on the setting jig.

2) Adjust the slider to the length of sample.



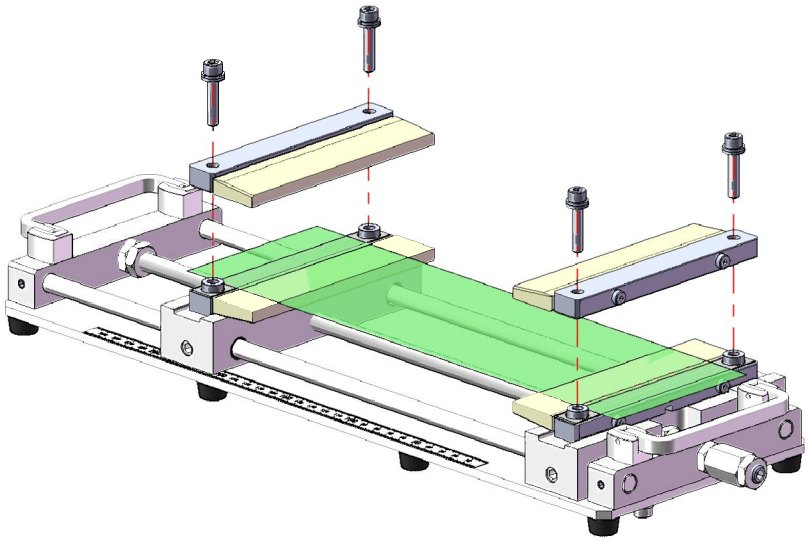




3) Set the sample on wedge-clamps.

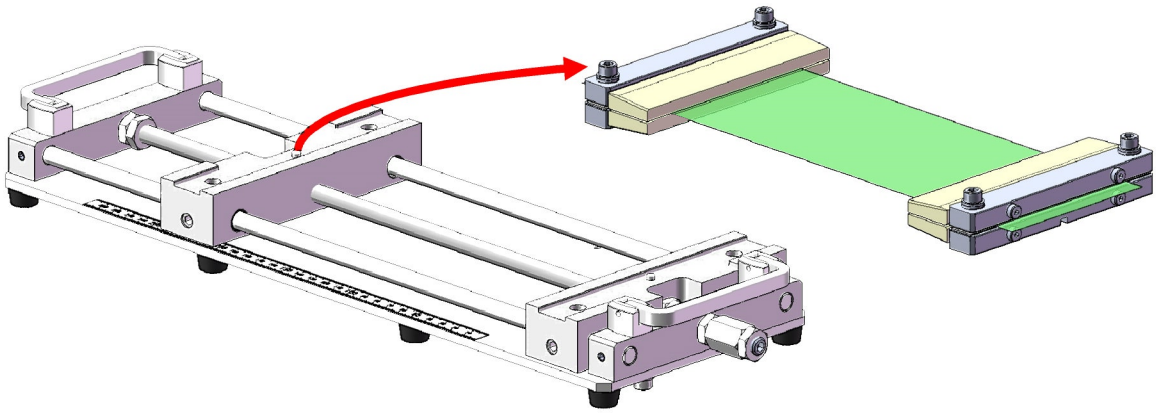
4) Pinch the sample with wedge-clamps

5) Tighten screws to hold the sample.

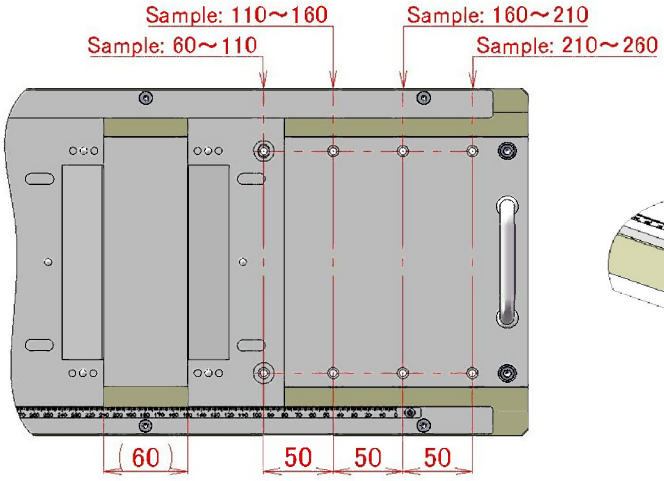
NOTE Tightening torque varies according to the sample.

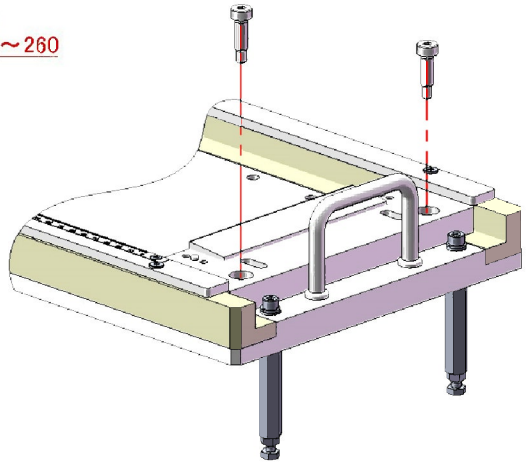


6) Remove the sample (wedge-clamps) from the setting jig carefully.

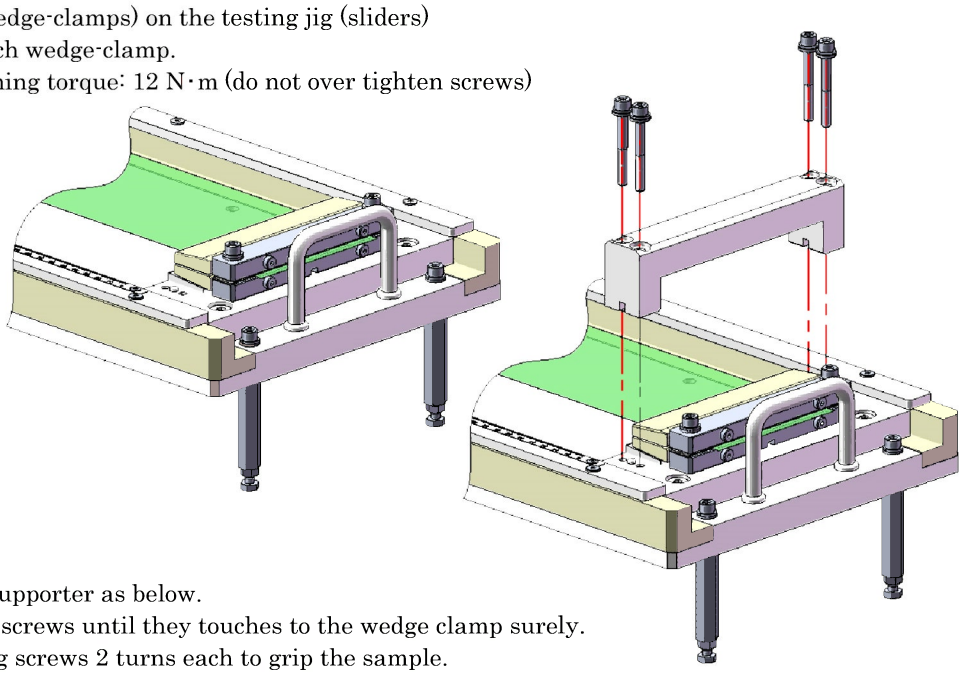


7) Locate the driving unit on the full-forward position.
8) Select a position (from four) and fix the fixed slider according to the sample.
CAUTION Tightening torque: 12 N·m (do not over tighten screws)

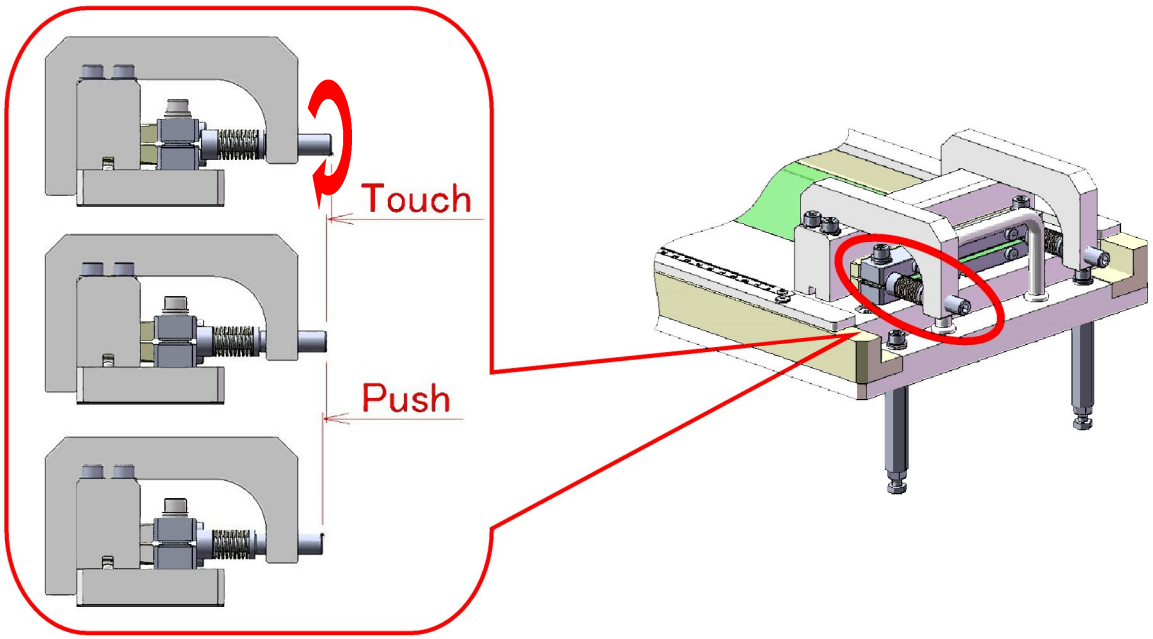


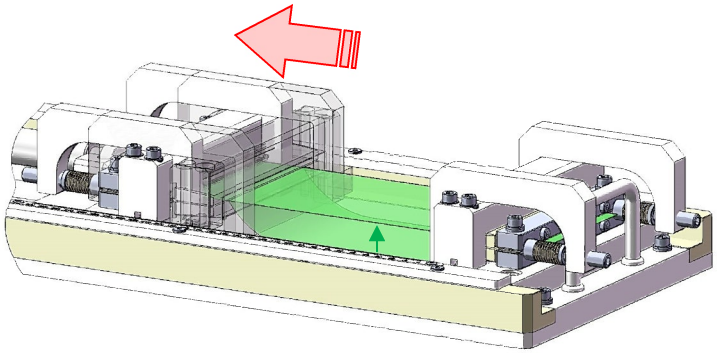
9) Put the sample (wedge-clamps) on the testing jig (sliders)
10) Attach cases to each wedge-clamp.
CAUTION Tightening torque: 12 N·m (do not over tighten screws)



11) Set wedge clamp supporter as below.
12) Rotate supporting screws until they touches to the wedge clamp surely.
13) Tighten supporting screws 2 turns each to grip the sample.
NOTE Supporting screws will push the wedge clamp in about 500 N.
NOTE The spring constant of coil spring is 184 N/mm (pre-load: about 184 N).



14) Move the moving slider to straighten the sample with each “JOG” button.

15) Input the present position coordinate into the starting position.

NOTE Can set other position into the starting position according to the testing condition.


16) Input the offset value to offset the starting position.

NOTE Can start stretching the sample from sagged condition to remove acceleration noise or something.

## 3.2 STRETCHING SPEED

Input the stretching speed into the operation panel. The speed is in “mm/sec”.

NOTE Input the returning speed into the “PARAMETER” view as below.


## 3.3 HOLDING TIME

The tester keeps stretch the sample at target condition in pre-set holding time.

Input the preset value into the operation panel.


## 3.4 PRESET COUNTER

The tester stops when the value of stretching reach to the preset value.

Input the preset value into the operation panel.

NOTE Input “zero”, the preset value, if you do not use preset counter (only count).


* Units of weights and measures shall be expressed in terms of the metric system (kg & mm) *

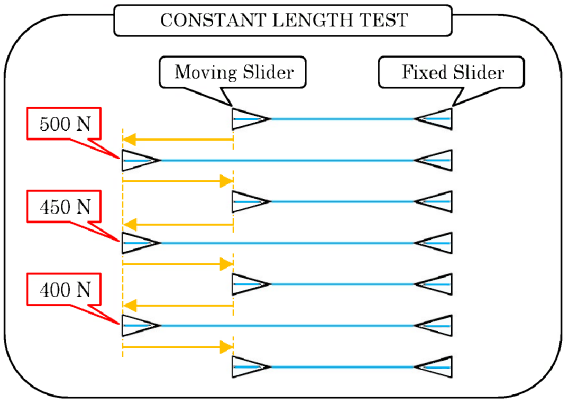
## 3.5 STRETCHING MODE and TARGET

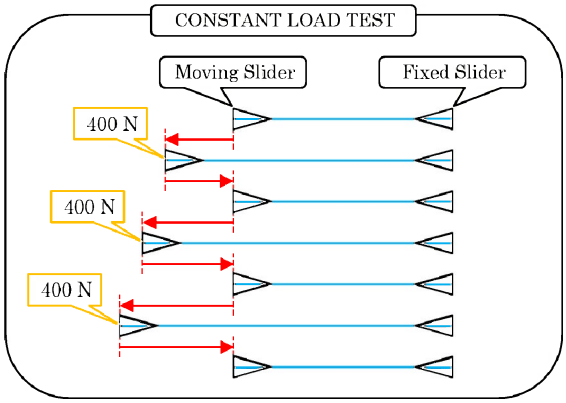
Tap the mode selection button and input the target.

NOTE Choose and conduct stretching test from 2 testing modes (target and output), as below.


| TARGET (constant) | OUTPUT | | |
|---|---|---|---|
| | Every times | Trend of change | Finished form |
| Stretching Length | Peaked load | Peaked load | Natural length |
| Stretching Load | Stretched length | Stretched length | Natural length |

*Target number is same in every stretching.




### 3.5.1 CONSTANT LENGTH TEST

In “Constant Length Test” mode, the tester stretch the sample to same length in every times.

1) Tap the “LENGTH” button.
2) Input length of stretching (mm).
   Ex. “Length of the sample = 100 mm, Length of stretching = 45 mm”
   ⇒ The sample will becomes 145 mm.

### 3.5.2 CONSTANT LOAD TEST

In “Constant Load Test” mode, the tester stretch the sample to same load in every times.

1) Tap the “LOAD” button.
2) Input load of stretching (N).
   Ex. “Length of the sample = 100 mm, Load of stretching = 400 N”
   ⇒ The stretching length will change by the characteristic of sample.

## 3.6 OPERATION


### 3.6.1 START

1) Tap the “START” button to start operation.

### 3.6.2 STOP

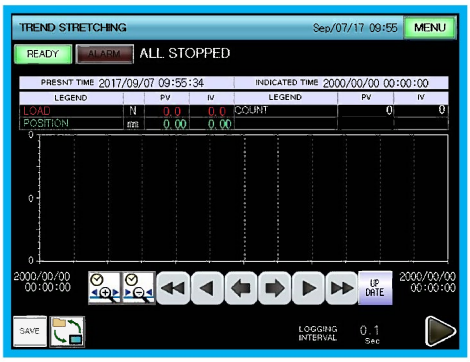
1) Tap the “STOP” button to stop operation.

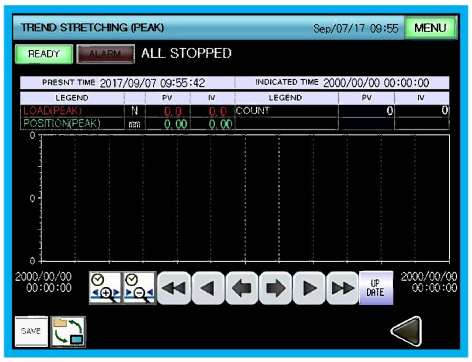
### 3.6.3 JOG

1) Select the jogging speed from slow “LOW” or rapid “HIGH”.
2) Press the “JOG” button, the stretching machine move slowly while keep pressing.

## 3.7 TREND (LOG)

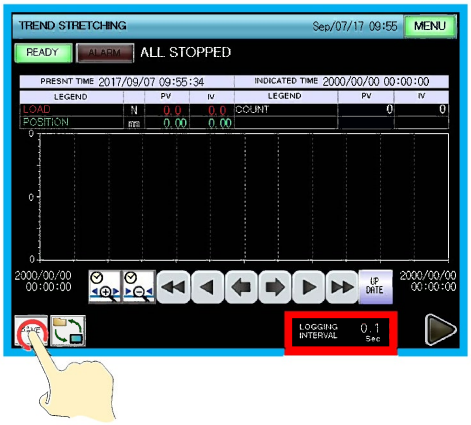
・The main-panel draw the graph (temperture, humidity and each reciprocating speed) everytime.
・Indicater cursor shown on when tap the graph. Confirm each indicated timing values “IV”.



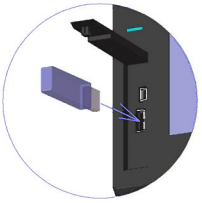




### 3.7.1 START LOGGING

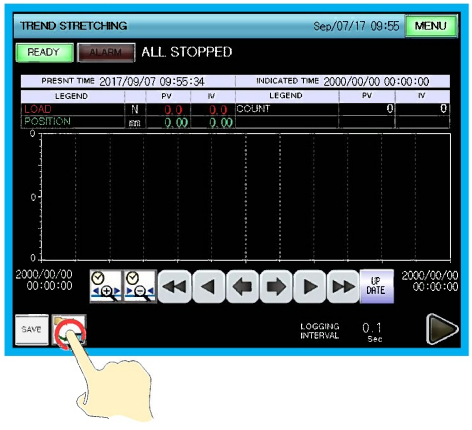
1) Input the logging interval.
2) Tap the “SAVE” button to create a new CSV file.

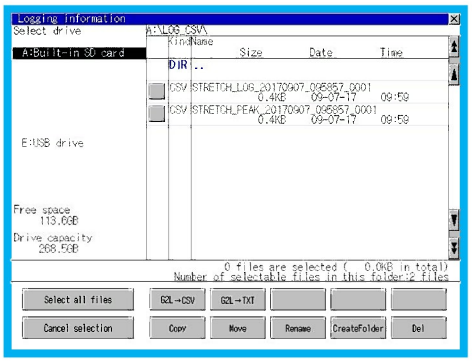



### 3.7.2 OUTPUT



1) Tap the “SAVE” button.
2) Insert the USB memory stick.
3) Tap the “OUTPUT” button. The “Logging information” view will be shown on.
4) Tap the directly (“STRETCH_LOG” or “STRETCH PEAK”).
5) Tap and select check boxes, CSV files which were made during a test period.
6) Tap the “Copy” button.
7) Tap and select the USB memory stick.
8) Tap the “Exec.” button. Follow the instructions to output log files.
9) Tap the “×” button to back the “TREND” view.

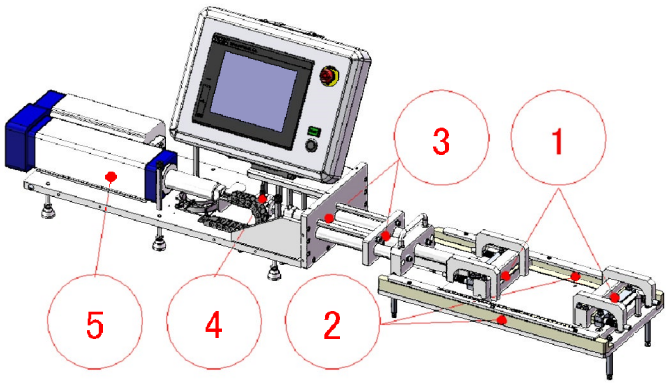



NOTE The system create a new CSV file when logs over 6500 times.

# 4. MAINTENANCE and INSPECTION

## 4.1 INSPECTION




| № | REGION | INSPECT | SCHEDULE |
|---|---|---|---|
| - | Interior & Exterior | Wipe or vacuum out all debris. | Weekly |
| 1 | Wedge clamp | Check it is not dented. | Every time |
| 2 | Guide rail | Check it is not scratched, the slider move smoothly. | Monthly |
| 3 | Bearing (Stretching Shaft) | Check it move smoothly (without wobble and dirt). | Monthly |
| 4 | Load cell | Check output is same as initial numbers with check kit as below. | Monthly |
| 5 | Robo cylinder | Check it move without noise. | Monthly |

NOTE Check the all items after a long-term stop.

| № | NAME | TYPE | Num. | MANUFACTURE (MATERIAL) | NOTE |
|---|---|---|---|---|---|
| 1 | Wedge clamp | ET200P180-002 | 2 | YUASA SYSTEM | |
| 2 | Guide rail | ET200P183-002 | 2 | YUASA SYSTEM | |
| 3 | Iglidur® | ZFM-2528-16 | 2 | igus | |
| 4 | Load cell | UNCLB-5KN | 1 | UNIPULSE | |
| 5 | Lobo cylinder | RCS3-RA8R-A-200-2.5-100 -T2-S-CJB-ML-SP | 1 | IAI | |

4.1.1 **CHECK THE OUTPUT SIGNAL** [Tool: 5 mm allen wrench, 2.5 mm allen wrench]

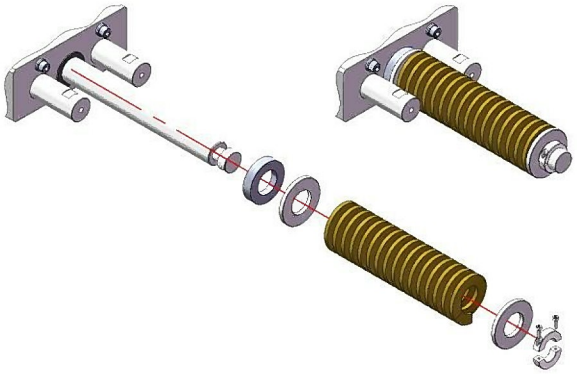
1) Remove the test jig, stretching.

2) Assemble the inspection jig to driving shaft as bellow.

NOTE The set-collar should rotate freely (loosen screws little).

3) Tap each position buttons to make the shaft three round trips between “position 0” and “position 3”

4) Tap each position butons position (1, 2, 3) and compare each load (output) with criterion datas.

CRITERION DATA

| POS. | CRITERION (INITIAL) | MEMO |
|---|---|---|
| 1 | N | N |
| 2 | N | N |
| 3 | N | N |

Initial check:_____

## 4.2 ERROR MESSAGE and CORRECTIVE ACTION

Confirm the messages that are displayed in the ALARM.

Correct the error according to the instractions of the ALARM and below.

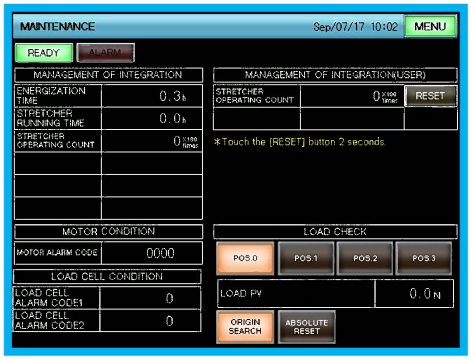
NOTE Tap the ALARM HISTORY button. The ALARM HISTRY will be shown on the screen.


| ERROR MESSAGE | CORRECTIVE ACTION |
|---|---|
| F050: PLC Battery Voltage Decreased (Stretching) | Change the battery refer to the manual of PLC. |
| F055: Load Cell Unit Error | Contact the sales agency. |
| F056: CC-Link Unit Error (SCON) | Contact the sales agency. |
| F058: CC-Link Communication Error (SCON) | Contact the sales agency. |
| F060: SCON Error | Check the error code on the “MAINTENANCE” view, and contact the sales agency. |
| F061: SCON Battery Voltage Decreased | Contact the sales agency. |
| F070: Emergency Stop (STRETCHING) | Release the lock of emergency stop button. (Turn the emergency stop button). |
| F071: External Stop Signal (Stretching) | Remove the external stop signal. |
| F080: Exceeded Load Limit | Confirm testing conditions, or clean up all equipments. |
| F081: Exceeded Cylinder Stroke | Confirm testing conditions and the sample. |
| F085: Stretching Load Low | Check the condition of the sample. |
| F086: Exceeded Streching Position Limit | Confirm testing conditions and the sample. |

## 4.3 TROUBLESHOOTING

If error is NOT displayed at“Error Expression”screen, refer to the trouble shooting as below.

NOTE If necessary, please confirm the situation of devices on the “MAINTENANCE MONITOR” view.




| PROBLEM | PROBABLE CAUSE | CORRECTIVE ACTION |
|---|---|---|
| Electricity will not supplied. | ・The plug isn’tsticking.<br>・It is not the 208V 3 phases | Confirm the electricity circuit. |
| Equipments will not operate. | ・Electricity isn’t supplied. | Turn on a switch of the power supply. |
| | ・A terminal interval dose not short- circuit. | Short-circuit between terminal, No.1 and No.2. |
| | ・Value of preset count is less than PV. | Reset the count, PV.<br>Set the preset count again. |
| | ・Other | Turn OFF the switch of the power supply, then turn ON after waiting 10 seconds. |
| Strange motion or noise in operation. | The screws and nuts are loosen. | Tightene the screws and nuts. |

WARNING Turn OFF the power supply switch when remove the safety cover.

NOTE The Case except the above, please contact the sales agency.

## 4.4 PARAMETER

Change the parameter of the each driving units, the chamber and operation panel as necessary.

NOTE Parameter which not displayed on screen can not change by user. Please contact us.


| PARAMETER | SUMMARY | DEFAULT |
|---|---|---|
| SEARCHING LOAD | * This equipment not have this function. | 5.0 [deg./sec.] |
| SEARCHING RANGE | * This equipment not have this function. | 50.0 [deg./sec.] |
| SEARCHING SPEED | * This equipment not have this function. | 1.86 [deg.] |
| STARTING POSITION (SLACK OFF) | * This equipment not have this function. | 0.2 [sec.] |
| STRECHING RETURN SPEED | The tester back the stretched sample in set speed. | 0.2 [sec.] |
| LIMIT OF LOAD | The tester will stop automatically when it find over load to prevent breaking the sample. | |
| LIMIT OF DISTANCE | The tester will stop automatically when it find over travel. | |
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| SCREEN SAVE SETTING | Choose using or not for the screen saver. | ENABLE |
| PASSWORD SETTING | Change the PASSWORD | 1 2 3 4 |

Quick Reference with Website

Add a keyword into the address bar from our website to access the quick reference.

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

http://www.yuasa-system.jp/manuals/ET000M017-002

～ Further Improve Reliability

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