For more information

SURUGA SEIKI CO.,LTD.

TEL +81-3-6711-5014 FAX +81-3-6711-5021

URL http://eng.surugaseiki.com/ Email e-ost@suruga-g.co.jp

- **Headquarters** 505 NShianatushinya,Shimizu-ku,Shizuoka-shi,Sizuoka 424-0067 JAPAN
  TEL.+81-54-344-0332 FAX.+81-54-344-4551
- **Tokyo Office** 3F Konan YKbild,2-4-1Konan,Minato-ku,Tokyo 108-0075 JAPAN
  TEL.+81-3-6711-5014 FAX.+81-3-6711-5021
- **Liaison Office** 900 Pepper Tree Ln.,Santa Clara, CA 95051
  TEL.+1-408-931-6210

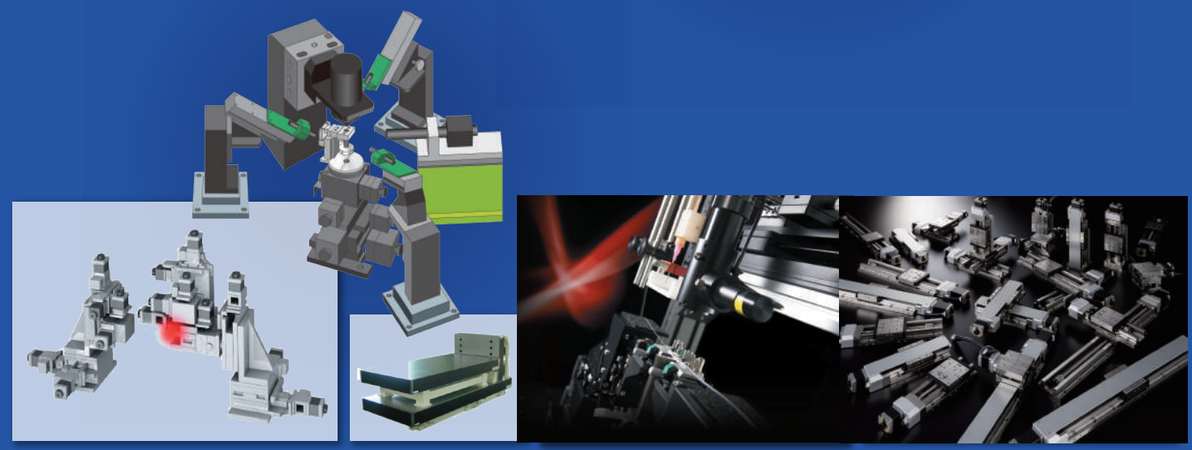
SURUGA SEIKI SOLUTION BOOK 2015 Spring

- Motorized Stage
- Manual Stage
- Fiber Aligment
- Optical Sensor
- Optoronics

Various motion in combination!

Posted a number of various use cases!

A reference for product selection!



Motorized Stages

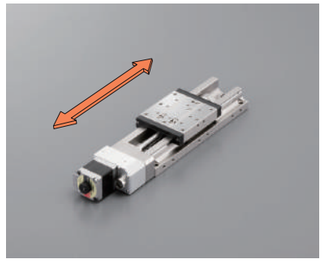
Motorized Stage

The positioning motrized stages are operated mainly in stepping motor.
Motorized linear stages are used mainly in ball screw, and motorized rotary stages are used maily in worm wheel.
It has been used to decide positioning and attitude for image processing by the installation of the part, and the inspection.
There is the series that standardized a motor option and, in addition to high torque, high resolution, various stepping motors without lose steps, supports the drive with the AC servo motor.

The classification and motion type of motorized stages

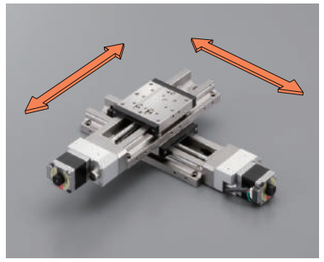
Liner stage

X axis stage



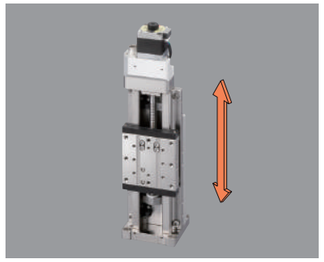
-Move to one direction(to the X axis).
-Motion guide has 3 type of linear ball guide, crossed roller guide and slide guide.

XY axis stage



-Move to two directions(to the X and Y axis).

Z axis stage



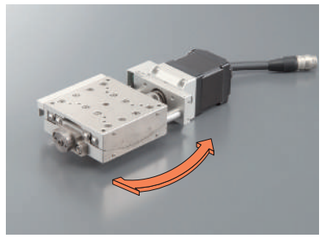
-Vertically move(to the Z axis).
-Horizontal Z axis means table surface goes up and down.

Rotary stage

Rotary Stage

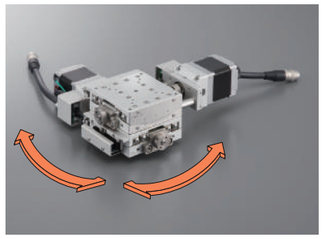
-Rotary motion type.
-There are type of 360°rotation and tiny angle rtation type.

1 axis goniometer stage



-Tilt around a stage surface space.
-Perfect for angle control. We have worm gear and ball screw type.

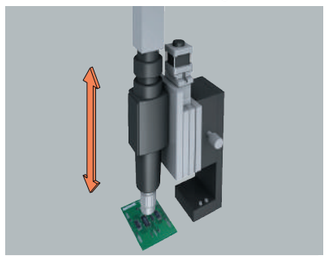
2 axis goniometer stage



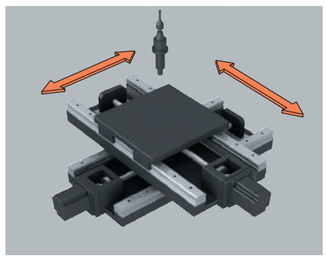
-Biaxial combination.
-It is possible to control angle variously with 2 axes.

A combination for achieving variety of motion

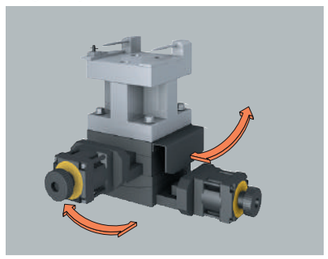
Z axis focusing



XY axes positioning



Angle adjustment in 2 axes Goniometer

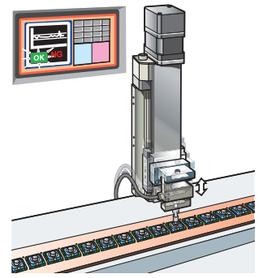


Examples of how motorized stage is used.

Inspection equipment for button switch presure of notebook PC

Outline

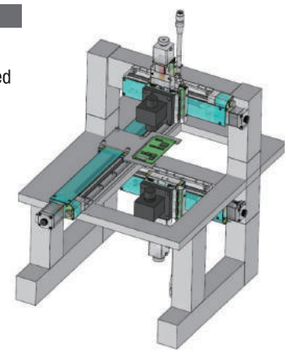
Z axis stage is used for the system that has inspection JIG, and judge acceptance or not.



Substrate inspection system

Outline

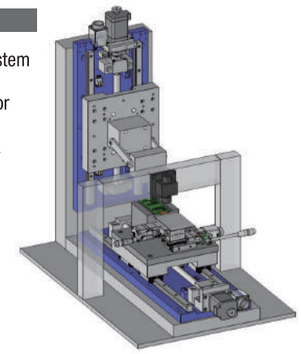
Judge acceptable or rejectable after captured an image of substrate.



ACF Welding System

Outline

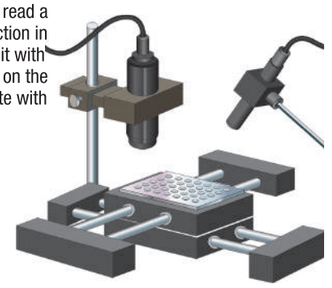
Terminal Welding System by ACF.
X-axis stages used for moving heater. XYθ stages used for work alignment.



【Bio】DNA Sequencer (Information reading equipment)

Outline

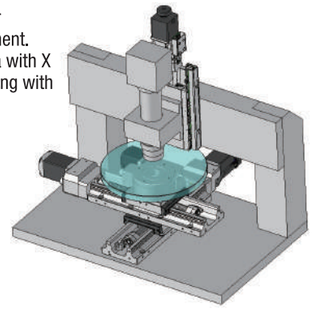
It is used to DNA sequencer which read a fluorescence reaction in the observatin unit with moving a sample on the compartment plate with XY axis stage.



Mapping Inspection Apparatus

Outline

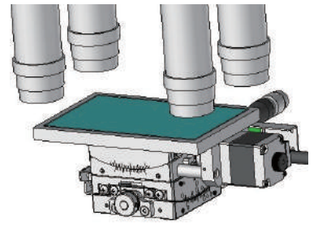
Example for wafer inspection equipment. Alignment camera with X axis, wafer positiong with XY axis.



Substrate parallelism control by imaging focus.

Outline

2 axes goniometer stage is used in substrate parallelism control by imaging focus.



Motorized Stages

Examples of how motorized stage is used.

Delay line

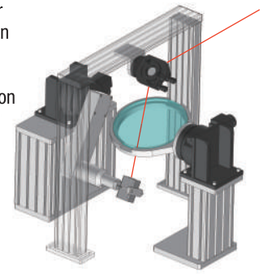
Outline

Enable an absolute position control by feedback control with the use of linear scale, and ikprove reliability of experiment.

Glass substrate evaluation unit

Outline

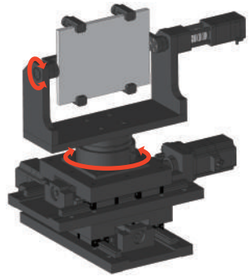
Work better for detector angle control to diffusion characteristics in combination with high rigidity motorized rotation stage using cross roller guide.



Panel luminance evaluation unit

Outline

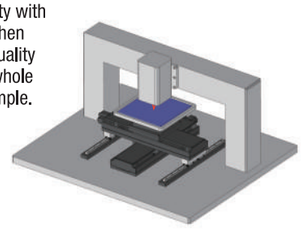
The combination on tilt mechanism to motorized Xyθ axis. It is adjustable an attitude of small panes and position with matching measurement items.



Tabletop laser processing machine

Outline

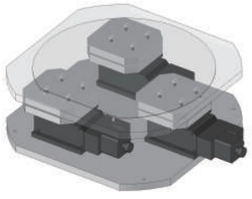
The panel-like sample accurately moved with motorized Xyθstage. Keeping the rigidity with a support guide, then enable the high quality maching for the whole surface of the sample.



Wafer exposure apparatus

Outline

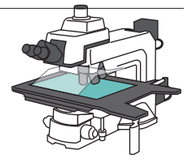
Enable the horizontal alignment by combine with three of motorized horizontal plane Z-axis stages.

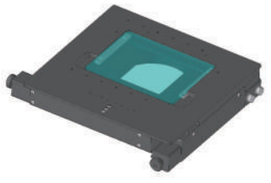


Stage for microscope

Outline

It is an XY stage whichi assumed a combination with a microscope. Also available transmitted illumination.



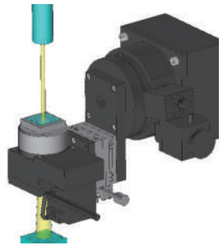


Examples of how motorized stage is used.

Crystallization X-ray diffractometer

Outline

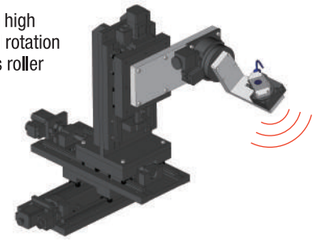
The combination of the motorized stages with a transmission holes allows analysis of the crystallization by finetuning of the sample angle.



Glass substrate evaluation unit

Outline

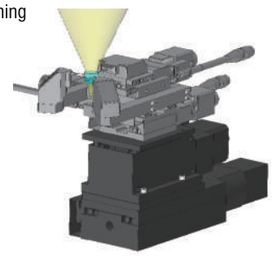
Work better for detector angle control to diffusion characteristics in combination with high rigidity motorized rotation stage using cross roller guide.



Lens alignment equipment

Outline

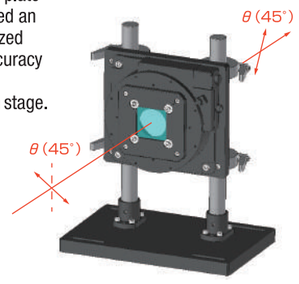
To be integrated a set-up, removing, chuck and fine adjustment by combining with the various motorized stages.



Laser line polarization rotation device

Outline

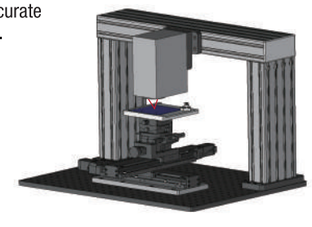
Even a large wave plate should be controlled an angle to the polarized wave direction accuracy by large caliber motorized rotation stage.



Film thickness distribution inspection equipment

Outline

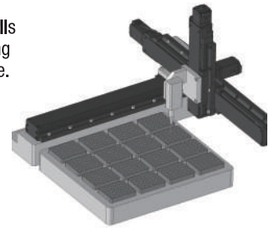
Adjust the sample position with four axis unit optionally. Motorized XY stage can be accurate and quick scanning.



Aligner

Outline

Can be organized from pick-up and reset process of sample to washing and drying tolls process by using a long stroke motorized stage.

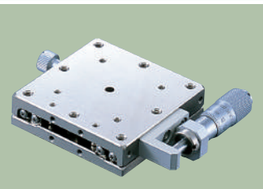
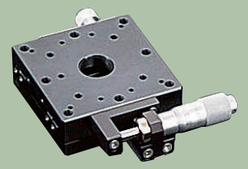
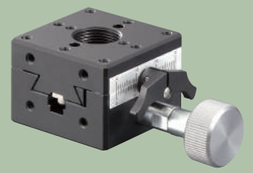
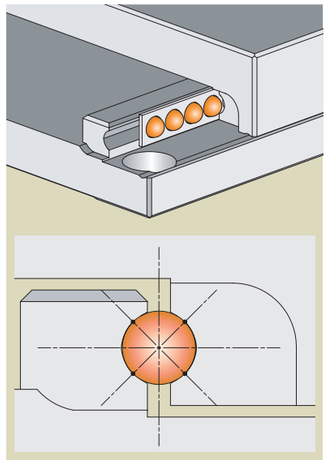
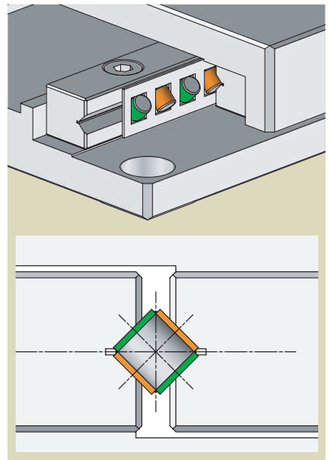
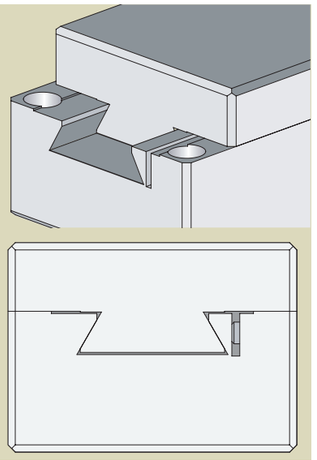


Manual Stages

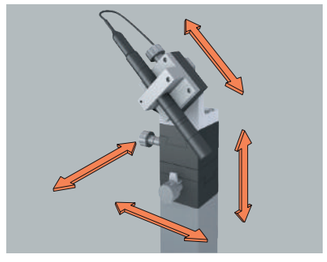
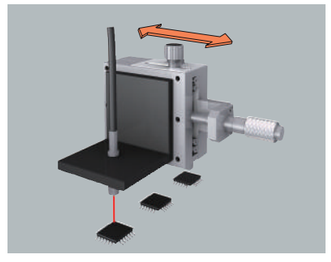
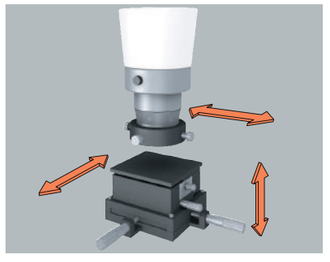
Manual

The positioning manual stages are operated mainly in micrometer.
Dovetail type, linear ball and cross roller are used for guide mechanism of the linear stage.
There are goniometer and rotary stage as well as motorized stage. Can be positioned it at any place by stacking a stage working in each direction.

The classification type of motorized stages

	リニアボール(SS)	クロスローラ	アリ式
Guide system			
Guide mechanism			
	-Gothic arc groove and ball four poit contact rolling mechanism. Features -Thin type of the integrated structure of guide and chassis. -It made from stainless stell (high rigidity, high precision and high load capacity). -Available black color	-Rolling mechanism of V groove rail and roller. Features -Made by aluminum. It is lightweight.	-Male and female trapezoid sliding mechanism(sliding). Features -Abundance of variation. -Low -cost

Various motion in combination

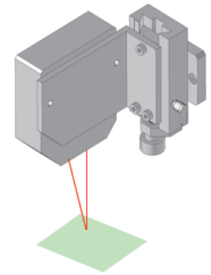
For CCD camera alignment	For faiber sensor alignment	For sample test analysis jig
		

Examples of how manual stage is used

Adjustment for displacement sensor

Outline

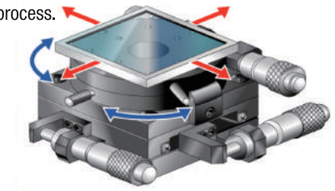
X stage is the best for positiong irradiation of displacement sensor. We have great variation of size.



Bonding machine

Outline

XY and rotary stages performs high accuracy coordinate plane alignment of works during the various implementation process.



Optical axis alignment for fiber optics

Outline

We propose the optimum combination of stages for fine adjustment of multiple axes, such as optical axis alignment.

Device bonding equipment

Outline

It is equipment which pastes a device together. Can be performed accuracy for positiong place coordinate, correction tilt and pasting in the multi-axis stage unit.

Adjustment for laser head

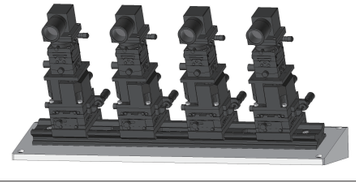
Outline

The Goniometer is the best for controlling positioning irradiation. Can be suited for fine adjustments of optical axis in various scene.

In vehicle appearance test

Outline

Adjust the camera by stage unit, and can be conducted varidation in actual condition of in-vehicle meter and display equipment.



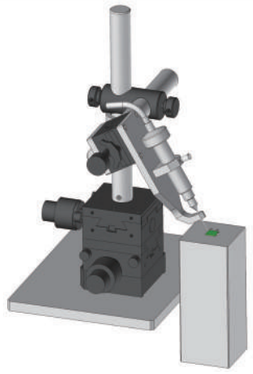
Manual Stages

Examples of how manual stage is used

Despense unit

Outline

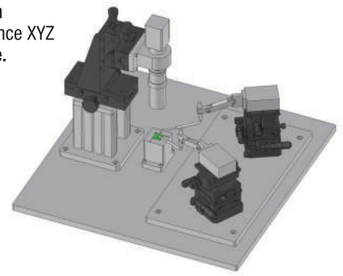
Positioning of the dispenser is easy with a combination of Dovetail stage and rod.



Probe unit

Outline

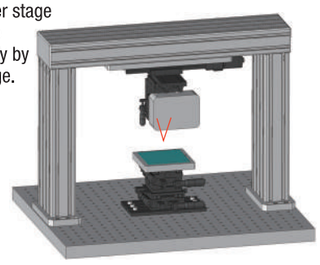
Can be contact accurately with high-performance XYZ stage for probe.



Work height measurement unit

Outline

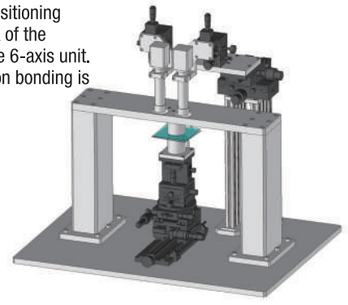
Adjustable work positioning and attitude with XY goniometer stage accurately. Can be scanned accurately by the motorized stage.



Substrate bonding unit

Outline

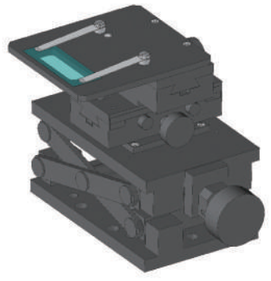
Adjust the positioning and the work of the camera in the 6-axis unit. High-precision bonding is possible.



Film observation jig

Outline

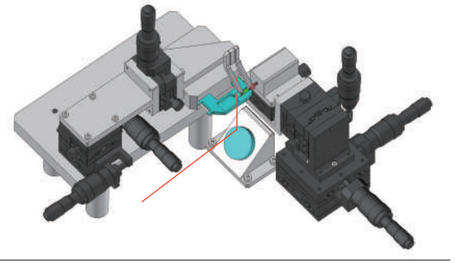
Lab jack and Dovetail XY-axis stage combination with a wide range of observation of efficiently realized.



Collimated light adjustment unit

Outline

A unit that is built-in holding , positioning, adjustment of optical axis saves working space.

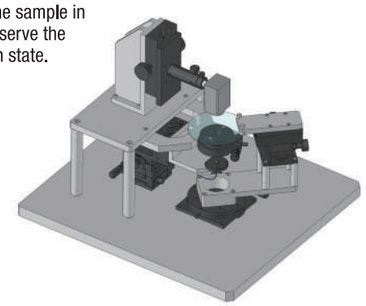


Examples of how manual stage is used

Polarizatin stage measurement unit

Outline

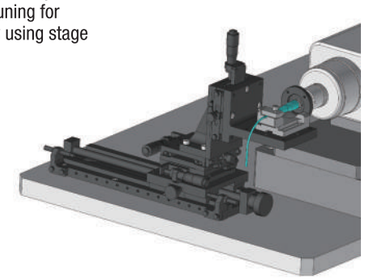
To rotate the sample in order to observe the polarization state.



Fiber evaluation unit

Outline

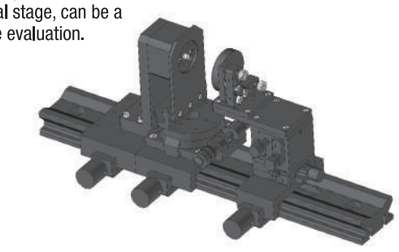
Enable positioning of fiber fine-tuning for detector by using stage unit.



Optical communication device characterization equipment

Outline

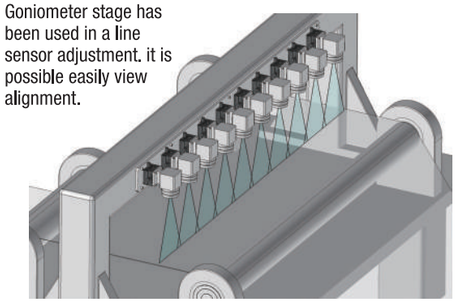
According to a combination of optical rail and manual stage, can be a simple evaluation.



Film material defect inspection apparatus

Outline

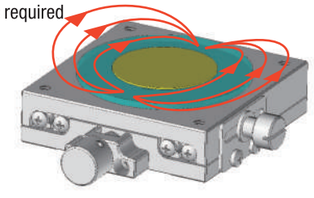
Goniometer stage has been used in a line sensor adjustment. it is possible easily view alignment.



Resin stage

Outline

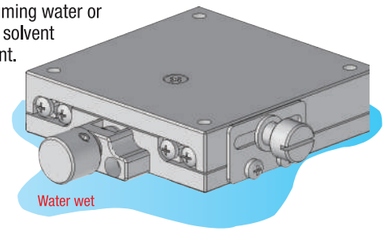
There are no metal parts in resin stage. Strong magnetic fields, such as, making it ideal for the non-magnetic is required applications.



Resin stage for medical, biotechnology field

Outline

In areas such as bio-medical and chemicals, you can use it with consuming water or an organic solvent environment.



CASE 3

Optical Fiber alignment

Guidance

Optical FIber alignment system

Can be performed the optical axis adjustment of the photodevice such as optical fiber, waveguide, silicon photonics, LD and PD efficiently and contribute it from a machine part to support a device evaluation and inspection, assembling (modularization) to a system device on low price and short delivery date.

Low price/Short delivery

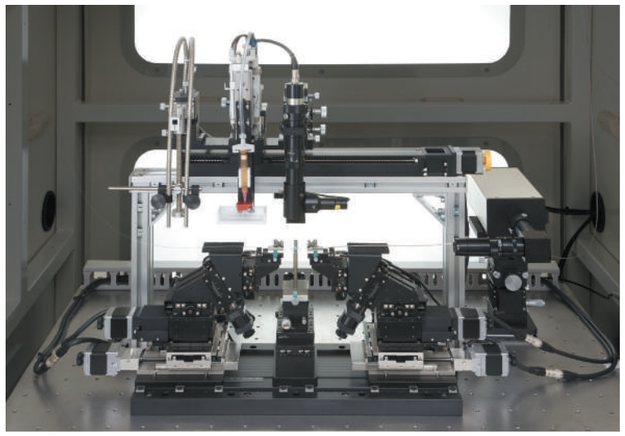
- It has been prepared each unit that configure the system as standard.
- All stages manufactured by SURUGA SEIKI.

Versatility/Extensibility

- Can be controlled data communication and I/O especially motorized alignment as standard alignment software.
- It can arrange for various types.

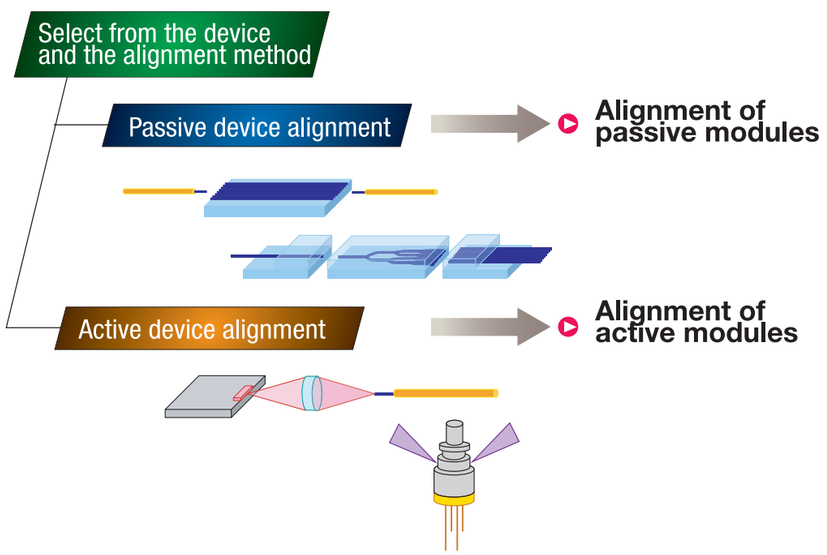
Customized

- We can customized for your needs.



Lineup

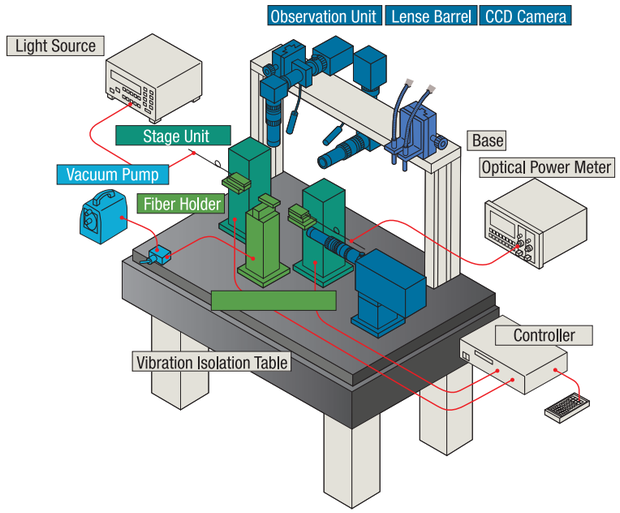
Lineup of alignment method

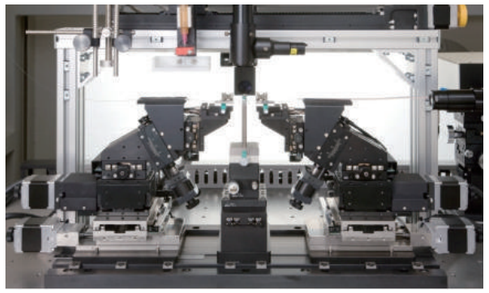


Passive

Alignment of passive modules

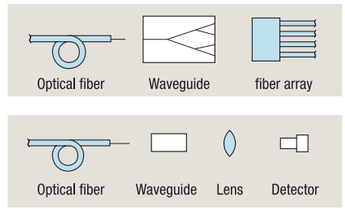
Can be performed the optical axis adjustment of the photodevice such as optical fiber, waveguide, silicon photonics,LD and PD efficiently and contribute it from a machine part to support a device evaluation and inspection, assembling (modularization) to a system device on low price and short delivery date.





Automatic Alignment Unit

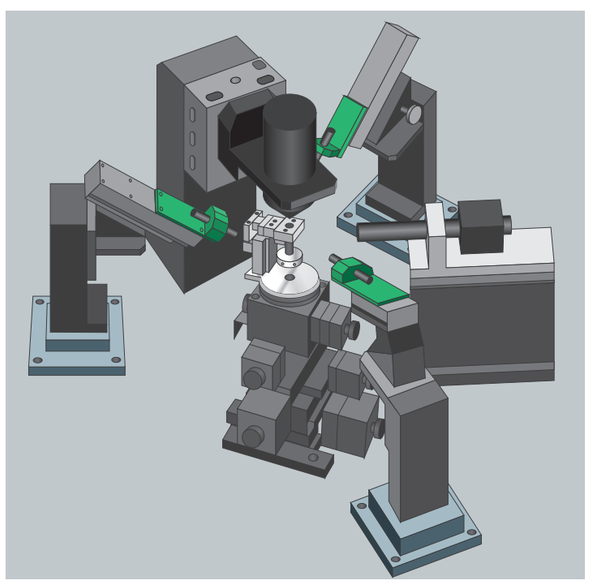
Application

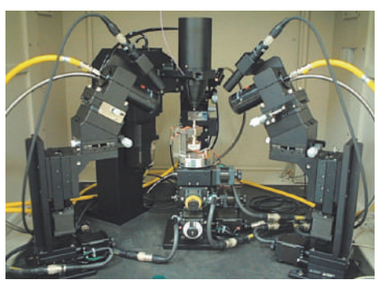


Active

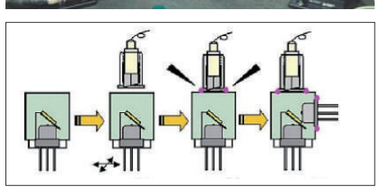
Alignment of active modules

It has a combination, such as optical fibar, SC laser and lense. It consists a alignment stage that collect SC laser light, and incident optical fiber without attenuation, the laser for welding, positioning camera, etc.



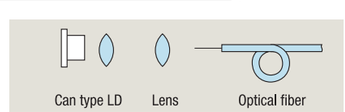


YAG alignment system



Bi Di module process

Application

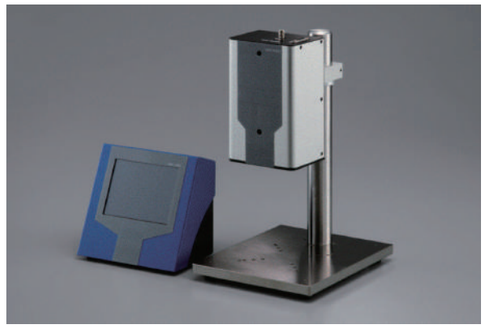


Optical Sensor

Type1 Laser autocollimetor is the best for angle, tilt and runout measurement

- Superior workability.
- Good for various application such as optical equipment, AV equipment, machinning etc.
- Can be digitalized, automatical judgment and automatic system by processing unit.

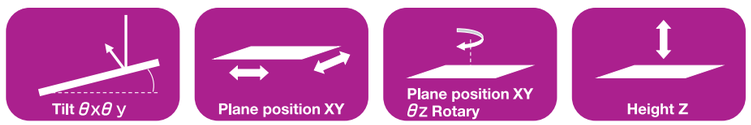
Type2 High speed, High resolution autocollimator HARAD



Dinamic measurement for tilt

- Contactless angle sensor by using laser.
- Compatible world wide highest sampling :500kHz(2μsec) and high resolution : 0.4sec.
- Improve defective analysis by analog voltage output and a wide variety analysis application.

Type3 6 axis position alignment O-PIAS



This 6 axis sensor can detect a position and atitude of works without contact

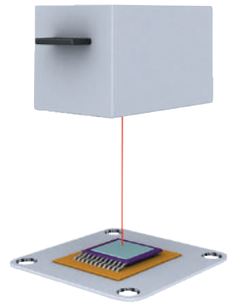
- Can be measured 6 positions such as tilt, height, plane position and rotation.
- Measurement repeatability is, tilt:0.05min, height/plane position:0.5μm, rotation angle:0.9min.
- Constructible an automatic positioning system with sequencer.

Examples of how Optical Sensor is used.

Tilt adjustment of imaging elements

Outline

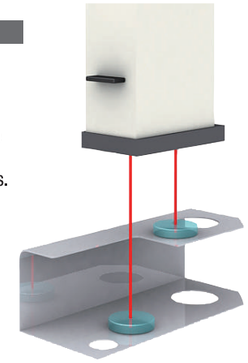
Z CCD or CMOS, inclination adjustment in the implementation of the imaging elements is very important. It will be accurately measured by the autocollimator.stage is used for the system that has inspection JIG, and judge acceptance or not.



Measuring parallelism of precision press devices

Outline

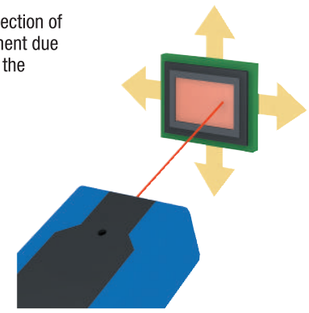
Autocollimator used to verify the parallelism between the other surfaces respect to the reference plane of the precision press devices.



Runout measurement of the imaging elements

Outline

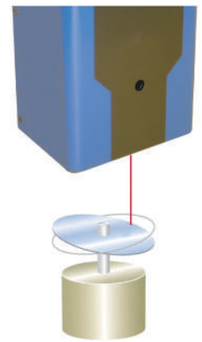
Measure the deflection of the imaging element due to vibration from the outside.



Runout measurement of rotary motor

Outline

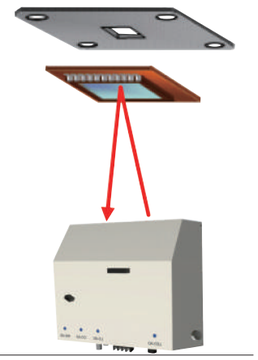
Runout measurement of high resolution to high speed rotating motor.



Positioning of the image elements

Outline

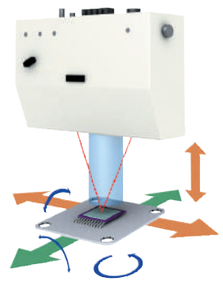
Optical Sensor used to confirmation of positioning, installing and adjusting the imaging device to the casing.



6 axis position(posture)adjustment

Outline

Optical Sensor measure the 6-axis position information of the imaging elements without mechanical switching mechanism.

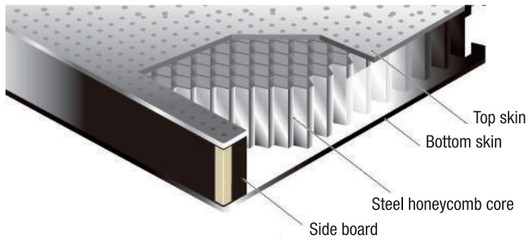


Can be customized in a flexible layout for the vibration isolation function of the highest performance

Performance of TMD(Tuned Mass Damping)structure

The TMD structure adapted in JSD and JHD, by a combination of oil and spring, and auxiliary mass, it is passive vibration damper to control the resonance of the table top. Resonance point of the fundamental mode of torsion and bending will exist in the table top, and TMD is a damper to suppress pin point them, to excellent effect in a narrow band. The torsion and bending mode, because it depends on the shape and size of the table top, the design of the TMD which is optimally adjusted are individually made. Oil has been completely sealed, it does not leak.

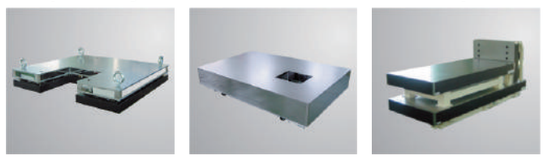
The features excellent steel honeycomb optical table top



Realization of high rigidity

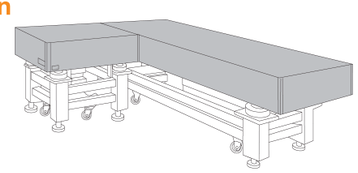
Rigidity is improved more than 60% compared to aluminium honeycomb at all from the top to the bottom skin, and using completely curable adhesive achieve high rigidity. This is totally different from the welded aluminium honeycomb product.

A specialty customized solution example



Docking solution(T,L,Z structure)
Stack solution(for 3D optical pass)

Docking version



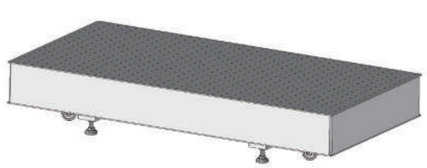
It is possible to join two or more tables to create ultra large vibration isolation system. It is possible to suit the conditions of the room and the design of the optical system, constitute a form of such L or T-shaped. It is also effective when the entrance is narrow and difficult to carry in.

Examples

Joint model

Designable tables in various scene.

Low model

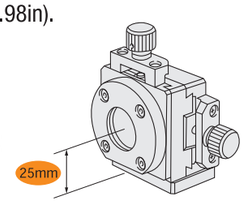


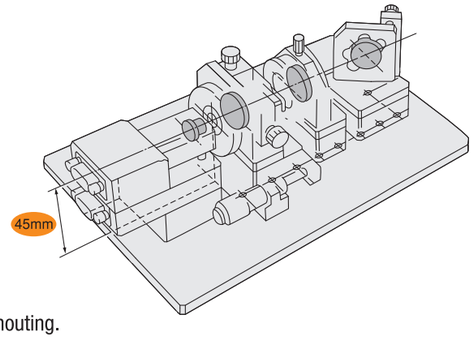
The big equipment can be suited stabilizatin position by low table

What is optostation style?

Designed 45mm(1.77in) optical axis.
All of optical axis holder is 25mm(0.98in).

Selection and installation is very easy!





Easy selection!

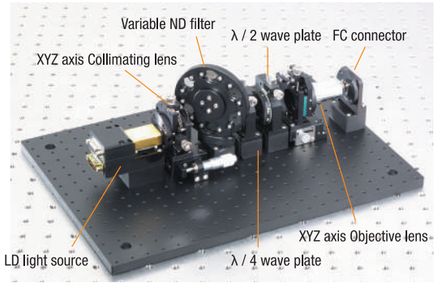
- Easy selection for lod and base.
- Easy selection for combination. Need only M3 screws for mouting.

You can shorten the selection time!

Do you need more spaces?

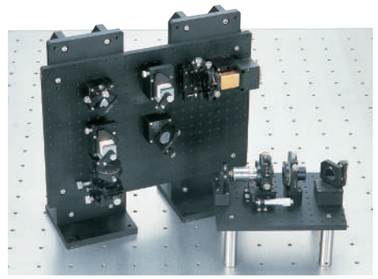
Problem solving 1

It is compact holder. Can be keep more spaces.



Problem solving 2

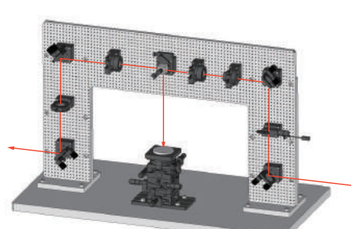
A vertical bread board.
A dable bread board
→keep more spaces by 3D structure.



Is both space-saving and high rigidity, you can effectively use the space!

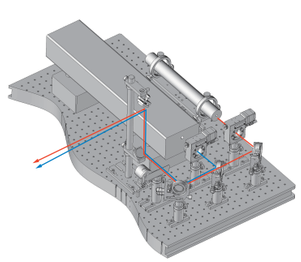
Examples of optical

A vertical type



It is an optical system to be incident on with a laser for a sample from right above. There is the merit that can be built in limited space by doing it so that length establishes an optical system. Holders realize stability superior to a rod for the conclusion with the screw for a base.

Optical light switching type



It is the optical system that assumed He-Ne laser (red) reference light. After having built an optical system, I t is evaluated the sample with He-Cd laser (blue). In addition, it enables it in an optical system compactly more that polarize holders in OPS.