

Dual-Position Optical Path Coupling  
3-Axis Linear Motor Demo Module



- Product Features
- High-precision linear motor three-axis stacking, with high-speed and high-precision alignment
  - Closed-loop system. Repeatability ±0.15um
  - High-precision linear motion solutions for optical applications and advanced optical coupling systems

Model No.		GNT130XYZ-160-160-60		
Spec.		X-axis	Y-axis	Z-axis
Mechanical Spec.	Effective Stroke (mm)	160	160	60
	Loading (kg)	10		
	Repeatability Accuracy (μm)	±0.15		
	Positioning Accuracy (μm)	±0.3		
	Straightness per Axis (μm)	±2	±2	±2.5
	XY Orthogonality (arc sec)	15		/
	YZ Perpendicularity (arc sec)	/	15	
	Speed Fluctuation (%)	±0.2		
	Static Stability (nm)	±50		
	Resolution (Pulse)(nm)	20		
Electrical Spec.	Maximum Speed (mm/s)	350	350	200
	Acceleration (G)	<1 (No load)		
	Continuous Thrust (N)	26.7		
	Peak Thrust (N)	133.4		
	Continuous Current (Arms)	1.6		
	Peak Current (Arms)	8		
	Continuous Power (W)	21.2		
	Peak Power (W)	528.0		
	Electrical Period (mm)	30.0		
	Maximum Total Supply Voltage (V)	330.0		
Electrical Spec.	Maximum Coil Temperature (°C)	125.0		
	Thermal Resistance Constant (W/°C)	0.3		
	Back Electromotive Force (EMF) (Vpeak/(m/s))	13.9		
	Inductance (mH)	1.8		
	Resistance (Ohms)	8.3		
	Electrical Time Constant (ms)	0.21		

Dual-Position Optical Path Coupling  
3-Axis Stepper Motor Demo Module



- Product Features
- Driven by ball screw to achieve high thrust and high precision positioning.
  - Repeatability ±0.5um.
  - Compatible with linear or rotary encoder.

※With a linear scale, the mechanism's repeatability accuracy can be improved to +/-0.1um.  
※For detailed specifications, please refer to the catalog available in the download section on the official website.

Mechanical Spec.	Model No.	SAX100-75-A2OPR	GYA100-100-A2OPR
	Table Size	120X100 mm	100X100 mm
	Effective Stroke	±37.5 mm	±50 mm
	Transmission Method	Ball Screw Ø8 , Lead1mm	Ball Screw Ø8 , Lead 2mm
	Rail	Precision Crossed Roller Guides	Precision Miniature Guides
	Stage Material/ Surface Treatment	Aluminum Alloy/ Anodized Matte	Aluminum Alloy/Anodized Matte
	Unit Weight	2Kg	3.5Kg
	Coupling	FAMMS12-5*5	FACCS21-5*5
	Accuracy Level	OP:Ultra Precision Type	OP:Ultra Precision Type
Precision Spec.	Cable Direction	R: Cable from Right Direction (Standard Stock) L: Cable from Left Direction	R: Cable from Right Direction (Standard Stock) L: Cable from Left Direction
	Resolution (Pulse)	1 μm (Full) / 0.5 μm (Half)	2 μm (Full) / 1 μm (Half)
	Maximum Speed (Full Step)	20 mm / sec	20 mm / sec
	Positioning Accuracy	10 μm	8 μm
	Repeatability Accuracy	±0.3 μm	±0.5 μm
	Load (Horizontal Installation)	30 Kg	16Kg
	Lost Motion	≤1 μm	0.5 μm
	Moment Stiffness	0.017(N·cm)	0.08(N·cm)
	Pitch / Yaw <small>(Single-Axis Accuracy Specifications)</small>	25"/20"	25"/20"
	Parallelism	20 μm	30μm
Electrical Spec.	Dynamic Straightness	3 μm	3μm
	Dynamic Parallelism	10 μm	25μm
	Orthogonality (Dual-Axis Accuracy)	/	10μ (Dual-Axis Accuracy)
	Motor	Type/ Shaft Numbers	S-Phase High-Resolution Stepper Motor C-42 Dual Shaft
		Brand/ Model No.	Oriental Motor / PKP544MN18B
	Driver Brand/ Model No.	Oriental CVD518-K	
		Oriental CVD518-K	
	Connector Type	12Pin Male Connector HRS	12Pin Male Connector HRS



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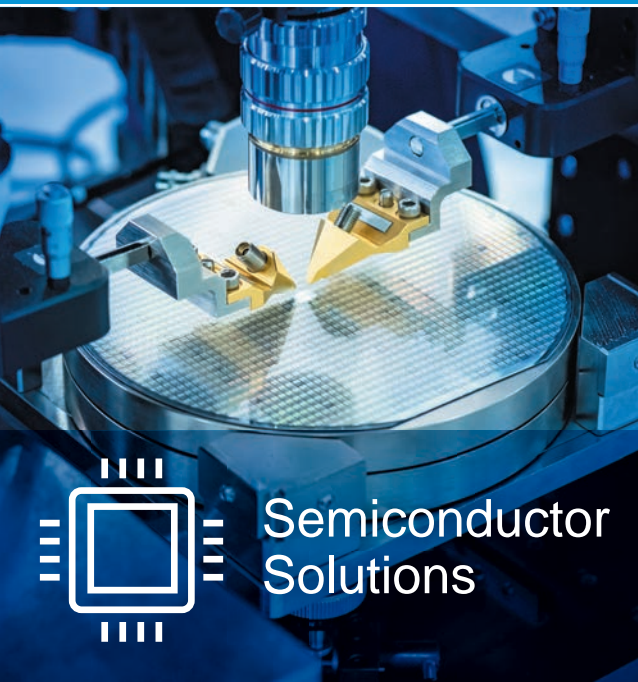


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## 12inch SiPh (Silicon photonics) Wafer-Mapping System



- Optical path coupling inspection in silicon photonics wafer testing.

Optical path coupling is a process in silicon photonics wafer inspection where optical fibers are aligned with the optical paths on the wafer to facilitate subsequent spectral analysis and characterization of the optical paths.

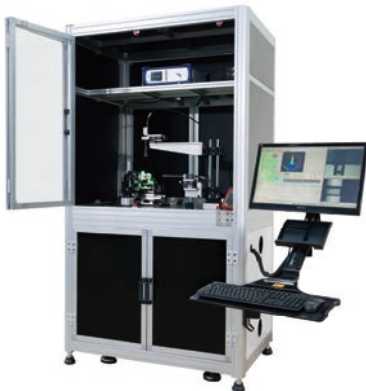
Model No.	High-Precision Customized Transfer Module			AXG6-75VMC-2OPR-XD	AXG6-50VMC-2OPR-XD
Axial	XY Axis	Z Axis	Theta Axis	Alpha Axis	Beta Axis, Fixture Adjustment Axis
Motor Type	Linear Motor	Linear Motor	Servo Motor	Stepper Motor	Stepper Motor
Effective Stroke	300mm	10mm	360°	±6°	±8.5°
Resolution	5nm	5nm	0.05 arc sec	0.00071° (Full) / 0.000355° (Half)	0.001°(Full) / 0.0005°(Half)
Positioning Accuracy	±0.5µm	±0.3µm	±2 arc sec	0.03°	0.03°
Repeatability Accuracy	±0.15µm	±0.15µm	±1 arc sec	±0.003°	±0.003°
Straightness	±2µm	±2µm	/	/	/
Flatness	±2µm	/	/	/	/
Axial Runout	/	/	5µm	/	/

※For detailed specifications, please refer to the catalog available in the download section on the official website.

### Product Features

- This system offers high precision, excellent stability, and flexible expandability, making it suitable for laboratory testing.
- Manual wafer replacement supports 8-12 inch wafers, accommodating different on-site requirements and providing versatility.
- Supports FAU and grating vertical coupling (Grating Coupling) and O-O optical testing.
- Supports testing parameters for coupling loss (dB/cm) and coupling efficiency (%).
- Utilizes a high-precision coupling controller with full closed-loop control and hardware synchronization, optimizing coupling algorithms to enhance accuracy and speed.
- Features image-assisted functionality for more convenient operation during the testing process, with rapid calibration and accurate initial positioning.
- The high-precision linear transfer stage offers repeatability accuracy 0.15 µm, meeting current industry requirements for optical coupling.
- The fixture is equipped with a high-precision height gauge to ensure consistent alignment of the incident optical fiber end face to the wafer surface, minimizing inconsistencies in coupling results and avoiding collision risks.

## Optical Fiber Coupling System



### Product Features

- Image-assisted initial alignment calibration can be completed quickly.
- Algorithmic coordinate system management allows for optical coupling alignment with fibers at different angles, offering high versatility.
- Motion track gauge includes area scanning, maximum light intensity search, enabling effective trajectory deviation compensation calculations for high-precision alignment.
- High-resolution motors and light encoders, combined with light intensity feedback, provide real-time precision motion control with high repeatability.
- The new process machines feature smaller backlash and higher repeatability.
- Interface integration supports machine communication, image-aided functions, coordinate system management, motion control algorithms, 3D data, and image display, making the system user-friendly and convenient to implement.

- Multi-layer lenses with automatic optical axis coupling.
- Automatic fiber alignment
- Automatic silicon photonic waveguide coupling alignment

According to actual needs, different modules and fixtures can be matched, making it suitable for fibers with various cross-sectional angles. This setup enables efficient calculations, generating scanning trajectories and point adjustments to achieve precise and rapid alignment.

### CXN80 Series (lead 1mm) Specification

Category	Oriental motor PKP series	Fastech EZ SERVO	Oriental motor AZ series	Oriental motor 5-Phase
Motor	5-Phase stepper motor	2-Phase stepper motor	2-Phase stepper motor	5-Phase stepper motor
Control	Open loop	Closed loop (optical encoder)	Closed loop (optical encoder)	ATOM Optical Scale
Type	N/A	Incremental	Absolute	Incremental
Resolution	1µm(full step) 0.5µm(half step)	0.05µm	0.1µm	0.1µm
Resolution (1/20 microstep)	0.05µm	N/A	N/A	N/A
Positioning Accuracy (5µm)	3µm	3µm	3µm	3µm
Repeatability Accuracy (±0.5µm)	±0.3µm	±0.25µm	±0.25µm	±0.15µm
Lost Motion (<1µm )	0.5µm	0.3µm	0.3µm	0.1µm

※For detailed specifications, please refer to the catalog available in the download section on the official website.

## PIC Module & FAU Coupling System



### Product Features

- Application of high-resolution stage (A6E series).
- Integrates with other precision slides for efficient production and high yield.
- Both of fiber optical modules and silicon photonics modules can be coupled.
- Can do Tx-Rx coupling.

- 1.6T / 800G silicon photonics modules with Tx-Rx coupling.

Combination of manual and motorized precision modules with self-developed fiber array coupling software, optimizing coupling accuracy and speed to the best conditions.

### Specification Table

Categories	Model No.
Motorized Stages	A6E-6701S-R-MH
	GRH20-25
	GKS4580-400-12N-P10-CPQVD
Manual Stages	CXS6030-S2OPBN-JH
	MC1B-60
	MZA-60
	MX60-SSR
	MC1D-4080U
	MMS-65
	MRE40-A

※For detailed specifications, please refer to the catalog available in the download section on the official website.

## CPO (Co-Packaged Optical) Solution for Photonics Coupling System



- Application of Grating coupling
- Application of Edge coupling

Customizable with different modules and fixtures, machine vision assists with initial calibration and various search algorithms ensure precise and fast alignment.

Model	OC1-CXN6075-S2OPAN-MH-P1-10	OC1-CXN6050-S2OPAN-MH-P1-10	OC1-CZLN6050-S2OPAN-MH-P1-10	AXG6-125VMC-2OPR-MH	AXG6-100VMC-2OPRB-MH
Spec.	X axis (upper)	Y axis (lower)	Z axis	θx · θz	θy (Right-folded motor)
Axis	X axis (upper)	Y axis (lower)	Z axis	θx · θz	θy (Right-folded motor)
Lead of ball screw	1mm	1mm	1mm	1mm	1mm
Stroke	75mm	50mm	50mm	±4°	±5°
Resolution	5µm(Full) / 2.5µm(Half)	5µm(Full) / 2.5µm(Half)	5µm(Full) / 2.5µm(Half)	0.0022°(Full) / 0.0011°(Half)	0.00275°(Full) / 0.001375°(Half)
Maximum speed	15mm/sec	15mm/sec	20mm/sec	4.4°/sec	5.4°/sec
Positioning Accuracy	3µm	3µm	3µm	0.03°open loop	0.03°open loop
Repeatability Accuracy	±0.1µm	±0.1µm	±0.1µm	±0.003°open loop	±0.003°open loop
Lost Motion	0.1µm	0.1µm	0.1µm	<0.003°open loop	<0.003°open loop
Load capacity	12Kgf	12Kgf	9Kgf	5Kgf	5Kgf
Motor	PK523HPMB (high resolution)	PK523HPMB (high resolution)	PK523HPMB (high resolution)	PK523HPMB (high resolution)	PK523HPMB (high resolution)
Optical encoder	ATOM series resolution : 0.05µm	ATOM series resolution : 0.05µm	ATOM series resolution : 0.05µm	N/A	N/A

※For detailed specifications, please refer to the catalog available in the download section on the official website.

### Product Features

- Image-assisted initial positioning calibration.
- Motion track gauge includes area scanning, maximum light intensity search, enabling effective trajectory deviation compensation calculations for high-precision alignment.
- High-resolution motor and optical encoder used with light intensity feedback to achieve real-time precision motion control with high repeatability.
- High precision 6-axis modules with repeatability 0.1µm.
- Available for grating coupler and edge coupler application.
- Interface integration supports machine communication, image-aided functions, coordinate system management, motion control algorithms, 3D data, and image display, making the system user-friendly and convenient to implement.

## 12Axis Manual Fiber Alignment Stage Module

- Suitable for developing experimental samples for fiber optic product coupling in lab.

Compact mechanical design can reach to stable and hi-precision needs, and minimum resolution can reach 0.5µm. Suitable for fiber optic device coupling.

### M6E-2200B-L Specification

Spec.	Stroke		Accuracy	
Axial	Coarse adjustment	Fine adjustment	Coarse adjustment	Fine adjustment
X	±6.5	±0.3	10 µm	0.5 µm
Y	±6.5	±0.3	10 µm	0.5 µm
Z	±6.5	±0.3	10 µm	0.5 µm
θx	±3°		≈29.3° / scale	
θy	±3°		≈27.8° / scale	
θz	±4°		≈33 ° / scale	

※For detailed specifications, please refer to the catalog available in the download section on the official website.

### Product Features

- Customized mechanical design.
- Application for fiber coupler operation.
- Compact multi-stage design can emerge best rigidity.
- Able to set up as coarse or fine adjustment.
- Suitable for laboratory experiments, prototyping or small-batch production.