

PROVIDER OF PROFESSIONAL HIGH-PRECISION BEAM STEERING COMPONENTS AND SOLUTIONS





Customized Services

Mirrors can be customized in
different **Sizes** (3~100mm),
Wavelengths (193nm~10600nm),
Coatings (dielectric, silver, gold),
Materials (Sic, Si, beryllium, quartz), etc.



Fast Lead Time

15 work-days for standard
galvo and 3-5 weeks
for customized galvo.



Professional Services

Professional technical
support and fast
response services.

GALVO MOTOR

Scanner Optics has the most comprehensive series of galvo motors in the industry, including the STGalvo, UltraGalvo and ExtraGalvo. These three series of galvo motors are composed of dynamic magnetic based technology, high-resolution and high-precision sensors, which are mainly used for driving mirrors to reflect laser beams in various laser processing and beam scanning applications.

After years of efforts, galvo motors from Scanner Optics have completed multiple updates and iterative optimization, which not only excellent dynamic performance and fast response speed but also high positioning precision and low drift. Based on high-performance galvo motor technology, Scanner Optics has developed multiple series of scan heads to meet the different industry applications.



*Pictures are from the internet

STGALVO MOTOR



ST201



ST200



ST210



ST215



ST218



ST220



ST231



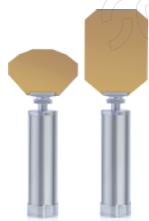
ST230



ST240



ST250



ST260

FEATURES



Compact structure encoder with a position resolution of 18 bits. High repeatability accuracy.



Special optimized motor structure with high mechanical accuracy and large torque constant.



Excellent dynamic performance. Fast response speed. Long-term stable performance.



Special optimized encoder structure. Linearity >99.6%@20° deflection angle.



Rich configurations, suitable for the mirror with 3-100mm aperture.

STGalvo Motor	201	200	210	215	218	220	231	230	240	250	260
Input Beam Aperture (mm)	≤7	≤7	≤7	≤7	≤7	7-10	10-14	14	20-30	50-80	50-120
Moment of Inertia (g·cm ²)	0.01	0.013	0.018	0.028	0.024	0.126	0.67	0.78	2.073	14.3	40.47
Force Constant (N·mm/A)	0.9	1.2	2.7	3.6	3	6	11.1	13.1	20	70.8	86
Coil Resistance (Ω)	2	2.1	3.6	2.1	2.7	2.8	1.27	1.12	1.1	0.9	1.2
Coil Inductance (μH)	25	35	70	70	120	180	171	149.1	231.6	343	580
Max. Continuous Current (A)	1.2	1.2	1.5	3.5	2.5	3.5	3.5	3.5	4	7	10
Peak Current (A)	6	6	8	15	10	15	10	10	12	15	18
Rise Time (ms)	0.2	0.1	0.13	0.13	0.15	0.15	0.25	0.25	0.35	0.8	1.0
Weight (g)	12	13	18	25	50	50	200	230	320	420	1040

Sensor Parameter

Max. Scanning Angle (°)	±20
Nonlinearity (%)	<0.4
Repeatability (μrad)	<2
Offset Drift (μrad/K)	<20
Gain Drift (ppm/K)	<80
Position Resolution	18 Bit ^②
Output Signal, Common Mode	130uA with AGC current of 40mA
Output Signal, Differential Mode	11.5uA/° with AGC current of 40mA

① All angles above are mechanical angles.

② After calculation, 18 bit @25° corresponds to 1.7urad, and 23bit @ corresponds to 0.75urad.

ULTRAGALVO MOTOR



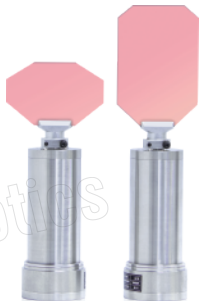
UltraGalvo S (10mm)



UltraGalvo M (14mm)



UltraGalvo L (20mm)



UltraGalvo L (30mm)

FEATURES

18bit

Compact structure encoder with a position resolution of 18 bits. High repeatability accuracy.



Special optimized motor structure with high mechanical accuracy and large torque constant.



Excellent dynamic performance. Fast response speed. Long-term stable performance.



Special optimized encoder structure. Linearity >99.6%@20° deflection angle.

7-50

Rich configurations, suitable for the mirror with 7-50mm aperture.

UltraGalvo Motor	S	M	L
Input Beam Aperture (mm)	10	14	20-30
Moment of Inertia (g·cm ²)	0.34	1.2	5.1
Force Constant (N·mm/A)	7.5	15	24
Coil Resistance (Ω)	2.7	2.6	1.58
Coil Inductance (μH)	165	275	300
Max. Continuous Current (A)	2.5	3.5	5
Peak Current (A)	10	10	10
Rise Time (ms)	0.18	0.3	0.7
Weight (g)	220	300	400
Sensor Parameter			
Max. Scanning Angle (°) ^①	±12.5		
Nonlinearity (%)	<0.4		
Repeatability (μrad)	<2		
Offset Drift (μrad/K)	<15		
Gain Drift (ppm/K)	<50		
Position Resolution	18 Bit ^②		
Output Signal, Common Mode	Typical 170uA with AGC current of 30-40mA		
Output Signal, Differential Mode	9-10uA/° with AGC current of 30-40mA		

① All angles above are mechanical angles.

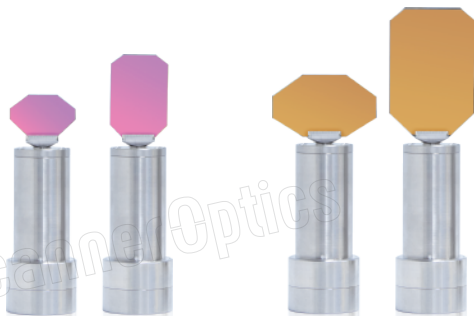
② After calculation, 18 bit @25° corresponds to 1.7urad, and 23bit @ corresponds to 0.75urad.

EXTRAGALVO MOTOR



ExtraGalvo S (10mm)

ExtraGalvo M (14mm)



ExtraGalvo L (20mm)

ExtraGalvo L (30mm)

FEATURES

23bit

Self-developed encoder.
Compact structure.
The position resolution
is up to 23 bits.



The encoder has
high repeatability accuracy.
Low drift for long-term operation.



Excellent dynamic perfor-
mance. Fast response speed.
Long-term stable perfor-
mance.



Special optimized motor
structure with high mechanical
accuracy and large torque
constant.

10-50

Rich configurations, suitable
for the mirror with 10-50mm aperture.

ExtraGalvo Motor	S	M	L
Input Beam Aperture (mm)	10	14	20-30
Moment of Inertia (g·cm ²)	0.6	1.5	7.2
Force Constant (N·mm/A)	7.5	15	24
Coil Resistance (Ω)	2.7	2.6	1.58
Coil Inductance (μH)	155	275	385
Max. Continuous Current (A)	2.5	3.5	5
Peak Current (A)	10	10	10
Rise Time (ms)	0.2	0.3	0.7
Weight (g)	220	300	400

Sensor Parameter	
Max. Scanning Angle (°) ^①	±12.5
Nonlinearity (%)	<0.1
Repeatability (μrad)	<1
Offset Drift (μrad/K)	<15
Gain Drift (ppm/K)	<8
Position Resolution	23 Bit ^②

① All angles above are mechanical angles.

② After calculation, 18 bit @25° corresponds to 1.7urad, and 23bit @ corresponds to 0.75urad.

ADAPTIVE MIRRORS

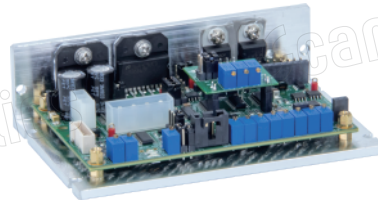
	<7mm	7mm	8.5mm	10mm	14mm	20mm	30mm	40mm	50mm	80mm
ST201	✓	✓								
ST200	✓	✓								
ST210	✓	✓								
ST215	✓	✓								
ST218	✓	✓								
ST220		✓	✓	✓						
ST231				✓						
ST230					✓					
ST240						✓	✓			
ST250								✓	✓	
ST260									✓	✓
UltraGalvo S				✓						
UltraGalvo M					✓					
UltraGalvo L						✓	✓			
ExtraGalvo S				✓						
ExtraGalvo M					✓					
ExtraGalvo L						✓	✓			

DRIVER

ANALOG SERIES



STServo I



STServo II



STServo III

FEATURES



Based on PID control mode, stable performance, high precision, fast speed.

3-100

Load size 3-100mm aperture mirrors.



Compact size, for different application scenarios. A variety of different performance of the driver board optional.



Suitable for Scanner Optics UltraGalvo series and STGalvo series galvanometers.



Rich I/O configurations.
Support $\pm 3V$ to $\pm 10V$ analog signal input.
Support for galvanometer position, error, speed and current signal output.

	STServo I	STServo II	STServo III
Number of Axis	Single	Single	Single
Analog Input Impedance	200K +/- 1% ohms (Differential) 100K +/- 1% ohms (Single Ended)	200K +/- 1% ohms (Differential) 100K +/- 1% ohms (Single Ended)	200K +/- 1% ohms (Differential) 100K +/- 1% ohms (Single Ended)
Position Output Impedance	1K +/- 1% ohms (for all other observation outputs)	1K +/- 1% ohms (for all other observation outputs)	1K +/- 1% ohms (for all other observation outputs)
Position Input Scale Factor	0.5V / mech degree 1V / mech degree 2V / mech degree	0.5V / mech degree 1V / mech degree 2V / mech degree	0.5V / mech degree 1V / mech degree 2V / mech degree
Position Input Range	±10V Max	±10V Max	±10V Max
Position Offset Range	±5%	±5%	±5%
Digital Signal Input Range	16bit DAC	16bit DAC	16bit DAC
Non Linearity of 16-Bit Digital Input	0.006%	0.006%	0.006%
Position Output Scale Factor	0.5V/degree, 1V/degree	0.5V/degree, 1V/degree	0.5V/degree, 1V/degree
Temperature Stability of Electronics	20 ppm/°C	20 ppm/°C	20 ppm/°C
Power Supply Requirements	±15V - ±28V	±15V - ±28V	±15V - ±28V
Maximum Drive Current Limit	6A peak power supply and load dependent	10A peak power supply and load dependent	12A peak power supply and load dependent
Operating Temperature Range	0-50°C	0-50°C	0-50°C

DIGITAL DRIVER



ExtraServo (A)
Light Load



ExtraServo (A)
Heavy Load

FEATURES



Support XY2-100 protocol, SPI protocol, ST2-100 protocol, digital differential signal input, and digital differential signal output.



Based on high-speed FPGA control mode, Support the information output for position, status and alarm.



Load size 3-50mm aperture mirrors.



Suitable for Scanner Optics STGalvo series, UltraGalvo series and Extra Galvo series galvanometers.



Compact size, a variety of the performance of driver are optional for different galvo motors and loads.



A variety of debugging modes for different applications, such as vector tune, high speed tune, etc.

	ExtraServo (A) Light Load	ExtraServo (A) Heavy Load
Number of Axis	Dual	Dual
Command Input	XY2-100 / SPI / ST2-100	XY2-100 / SPI / ST2-100
Analog Output Impedance	Un-terminated output of DAC8551, <1 Ω	Un-terminated output of DAC8551, <1 Ω
Position Output Scale Factor	0.4V / degree non-differential	0.4V / degree non-differential
Power Supply Requirements	$\pm 15V(\pm 10\%)$	$\pm 15V(\pm 10\%)$
Maximum Drive Current Limit	3A	10A
Quiescent Power	7.45W	7.95W
Operating Temperature Range	10 - 50 $^{\circ}C$	10 - 50 $^{\circ}C$
Dimensions	10.5cm x 7.0cm	10.9cm x 7.0cm
Temperature Stability of Electronics	20ppm/ $^{\circ}C$	20ppm/ $^{\circ}C$
Recommend Mirror Aperture	<7mm / 10mm / 14mm	20mm / 30mm / 50mm

ADAPTIVE MOTOR

	STServo I	STServo II	STServo III	ExtraServo (A) Light Load	ExtraServo (A) Heavy Load
ST201	✓			✓	
ST200	✓	✓		✓	
ST210	✓	✓		✓	
ST215	✓	✓	✓	✓	
ST218	✓	✓	✓	✓	
ST220		✓	✓	✓	✓
ST231		✓	✓		✓
ST230		✓	✓		✓
ST240/250/260		✓	✓		✓
UltraGalvo 10mm				✓	
UltraGalvo 14mm				✓	
UltraGalvo 20mm					✓
UltraGalvo 30mm					✓

