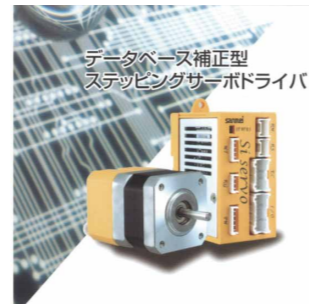


# Hybrid Stepping Motor



Si-servo, the smallest servo system in this field.

Si-servo built in Si-MoBo can be sold as a Motor itself.  
 Si-servo is the totally new stepping servo system, which was developed to achieve high-performance servo driving at the lowest cost.  
 Si-servo can perform highly precise positioning with smooth and quiet movement.  
 In addition, Si-servo has enough function for a use in high response systems.



Si servo products is registered trademark by Sanmei Co.,Ltd.

●Features

High accuracy positioning, Ultra smooth drive, closed loop operation, which were not achieved in the past, become reality.

Motor Model(TS36・・)		92N61S02 (0.01N)	41N61S02 (0.05N)	17N370S04 (0.2N)	17N371S04 (0.4N)	53N324S04 (0.9N)	53N325S04 (1.2N)	53N327S04 (2.0N)
Max Output Torque	N·m	0.017	0.062	0.24	0.44	0.87	1.8	2.3
Max Rotational Speed	rpm	4500	4500	4500	3000	2000	800/2000※1	2000
Rated Current	AO-p	0.35	1.5	2.0	2.0	2.0	2.0	5.0
Rated Voltage	V	3.0	1.0	2.2	2.8	2.1	4.5	2.2
Coil resistance	Ω	8.5±15%	0.7±15%	1.1±15%	1.4±15%	1.05±15%	1.7±15%	0.44±15%
Rotor inductance	mH	3.4±20%	0.55±20%	1.4±20%	2.4±20%	1.5±20%	5.8±20%	1.4±20%
Rotor Inertia	10 <sup>-7</sup> kg·m <sup>2</sup>	1.9	8	35	68	260	430	520
Shaft Run-out	mm T.I.R	0.05						
Radial play	mm max.	0.03	0.02					
Thrust play	mm max.	0.075						
Allowable overhang load	N	17.6	21.6	20.6		52.9		
Allowable thrust load	N	2.9	4.9	9.8		19.6		
Coil method	—	2-phase hybrid Stepping Motor Bipolar coil						
Insulation class	—	CLASS B						
Insulation resistance	MΩmin	100(at DC500V)						
Dielectric strength	V	500(at AC 1MIN)						
Operating temperature range	℃	-20~+50						
Operating humidity range	%RH	5~95						
Storage temperature range	℃	-40~+70						
Mass	kg	0.08	0.14	0.27	0.40	0.72	1.08	1.38

※1)2000rpm for Si-05DE Driver, 800rpm for Si-02DE Driver.

●Driver Specifications

Model	Si-02LDE	Si-02DE	Si-05LDE	Si-05DE
Applicable Motor model	TS3692N61S02	TS3641N61S02 TS3617N370S04 TS3617N371S04 TS3653N324S04 TS3653N325S04	TS3653N325S04	TS3653N327S04
Rated Output Current(AO-p)	0.35	2.0	2.0	5.0
Maximum Output Current(AO-p)	1.0	4.5	6.0	13.0
Controlling method	Transistor PWM (Sine wave drive)			
Permitted load Inertia	20 times the Motor Inertia			
Feedback	Incremental Encoder 200ppr (The motor model end S02) Incremental Encoder 400ppr (The motor model end S04)			
Overall dimension(mm)	39(W)×70(H)×55(D)		58.2(W)×76(H)×98(D)	
Ballpark Mass(kg)	0.18		0.34	
Power supply	Voltage(V)	Power supply	DC24V±10% or DC36V±10%	
		Control power supply	DC24V±10%	
	Power supply Current(A)	2	5	
Position command method		Communication and Control Input through 3 mode pulse lines and RS485		
Conditions for use	Temperature for use	0~+50℃		
	Storage temperature	-20~+85℃		
	Humidity for use or storage	Under 90%RH (No condensation)		
	Resistance Vibration	0.5G		
	Impact resistance	2G		
Standard functions	Dynamic braking	None		
	Regenerative function	Able to connect to external regeneration processing circuit		
	Over travel prevention	Hard OT, Soft OT (select ON or OFF parameters)		
	Command pulse resolution	1/65,535~65,535		
	Internal speed setting	Point table transfer speed, Jog speed, Reset speed		
	Display	1-LED(alarm display, Servo ON conditions)		
Input/Output	Input	Control Input	5-points (select function parameters)	
		Command pulse Input	CW/CCW, PULSE/SIGN, A/B phase Input(select parameters) Maximum response waves 750 kpps	
	Output	Control Output	3-points(select parameters), Brake release Signal	
Protection functions		EEPROM abnormalities, Encoder abnormalities, system abnormalities, over Currents, Driver overheating, excessive location deviation, Motor Current abnormalities, Control Current abnormalities		
Zero return mode		Zero LS signal Input or using mechanical stopper (set parameters of 7 methods)		
Multi-axis		Multi-drops of up to 15 axis with RS485		
Settings		Parameters are set through use of a computer (RS485 converter required)		
Standard, Environmental and Protection grades		UL conformance/ CE(self-declaration)/RoHS conformance/IP40		
Options		Cable (PG, 3m,5m,10m for power supply, 3m for other cable) Software for monitor, Reduction unit, Regeneration kit		

Depends on the condition, this product will not be suitable for your specifications. Please always consult with KSS due to the inquiry.

# Plastic Ball Screws

For customer's requests, KSS manufactures Ball Screws using several materials, because there are special environment which current steel cannot be adapted to. These products can be used under light load condition.

## ●Features

- Since it is lightweight, Inertia moment is small.
- It can be used in the water due to anti-rust.
- It can be used without a Grease.
- Less noises.
- Mass production is possible due to injection molding.
- It can be applicable to special environment(non magnetism, clean environment, heat resistance) by selecting materials.
- No metal wear powder come out of Ball Screws.



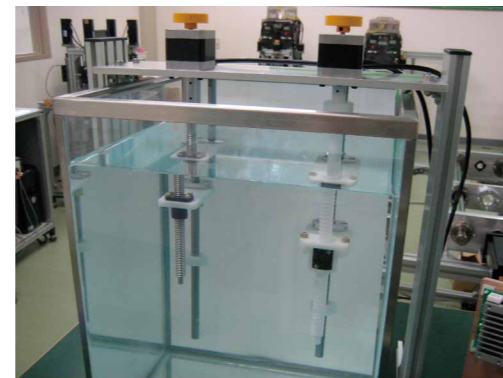
**Plastic Ball Screw**  
Collaboration with Otsuka laboratory  
Shizuoka Institute of Science and Technology



**Ball Screw made from Vespel®**  
Vespel is Dupont registered trade mark.

If inexpensive Plastic Ball Screw is requested, Ball Screws can be manufactured from Polyamide(PA) or Polyacetal (POM).

Note) Please designate specific material when inquiring Plastic Ball Screws.  
KSS will investigate the possibility of production.



**Usage of Plastic Ball Screws in water**