

Product Lineup

# TRANSERVO Series

# STEPPING MOTOR SINGLE-AXIS ROBOTS

The newly developed vector control method delivers functions that are comparable to the performance of servomotors. Newly added space-saving models also allow a more efficient layout.



## SS type

Slider  
type

Straight model

P.62



\* See the Clean type page for clean room model.

Space-saving model

P.63



## SR type

Rod  
type

Straight model

P.68



Space-saving model

P.69



Straight model (With support guide)

P.72



Space-saving model (With support guide)

P.73





Type	Size (mm) <sup>Note 1</sup>	Model	Lead (mm)	Maximum payload (kg) <sup>Note 2</sup>		Maximum speed (mm/sec) <sup>Note 3</sup>	Stroke (mm)	Detailed info page
				Horizontal	Vertical			
<b>SS type</b> (Slider type) Straight model / Space-saving model	W49 × H59	SS04-S	12	2	1	600	50 to 400	SS04-S : P.62 SS04-R(L) : P.63
		<b>NEW</b> SS04-R(L)	6	4	2	300		
			2	6	4	100		
	W55 × H56	SS05-S	20	4	-	1000	50 to 800	SS05-S : P.64 SS05-R(L) : P.65
		<b>NEW</b> SS05-R(L)	12	6	1	600		
			6	10	2	300		
	W55 × H56	SS05H-S	20	6	-	1000	50 to 800	SS05H-S : P.66 SS05H-R(L) : P.67
		<b>NEW</b> SS05H-R(L)	12	8	2	600 (Horizontal) 500 (Vertical)		
			6	12	4	300 (Horizontal) 250 (Vertical)		
	<b>SR type</b> (Rod type) Straight model / Space-saving model	W48 × H56.5	SR03-S	12	10	4	500	50 to 200
<b>NEW</b> SR03-R(L)			6	20	8	250		
<b>NEW</b> SR03-U			6	20	8	250		
W48 × H58		SR04-S	12	25	5	500	50 to 300	SR04-S : P.74 SR04-R(L) : P.75
		<b>NEW</b> SR04-R(L)	6	40	12	250		
			2	45	25	80		
W56.4 × H71		SR05-S	12	50	10	300	50 to 300	SR05-S : P.78 SR05-R(L) : P.79
		<b>NEW</b> SR05-R(L)	6	55	20	150		
			2	60	30	50		
<b>SR type</b> (Rod type with support guide) Straight model / Space-saving model	W105 × H56.5	SRD03-S	12	10	3.5	500	50 to 200	SRD03-S : P.72 SRD03-U : P.73
		<b>NEW</b> SRD03-U	6	20	7.5	250		
	W135 × H58	SRD04-S	12	25	4	500	50 to 300	SRD04-S : P.76 SRD04-U : P.77
		<b>NEW</b> SRD04-U	6	40	11	250		
			2	45	24	80		
	W157 × H71	SRD05-S	12	50	8.5	300	50 to 300	SRD05-S : P.80 SRD05-U : P.81
		<b>NEW</b> SRD05-U	6	55	18.5	150		
			2	60	28.5	50		

Note 1. Size is the approximate cross sectional size.

Note 2. Maximum speed varies with the payload. See the SR type page for more details.

Note 3. Maximum speed decreases due to ball screw critical speed when the stroke is long.

Maximum operating speed may drop when an external force is applied or the support guide sliding resistance is large. See the SR type page for more details.

**Point 1**

**New control method combines the best features of servo and stepping motors!**

Stepping motors provide great features such as low cost, yet they have a drastic drop in torque at high speeds and heavy current consumption when stopped.






The TRANSERVO by YAMAHA eliminates all these problems by adopting an innovative vector control method. In effect, the TRANSERVO delivers the same functions of a servo motor while using a lower cost stepping motor.

● **Energy saver!**

Control is basically the same as a servomotor so power consumption is kept to a minimum, which saves energy and helps cut down on CO<sub>2</sub> emissions.

● **Perfect stop!**

Also perfect stop can be achieved as the same as with ordinary stepping motors so choose this setting if needed.

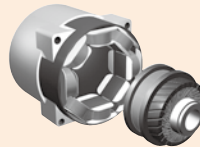
<b>Stepping motor</b>	 <ul style="list-style-type: none"> <li>• Simple design &amp; low cost</li> <li>• No vibration when it stops</li> </ul>	 <ul style="list-style-type: none"> <li>• High-pitched operating noise</li> <li>• Drop in torque at high-speed</li> </ul>
<b>Servo Motors</b>	 <ul style="list-style-type: none"> <li>• Smooth movement</li> <li>• Constant torque at all speed range</li> <li>• Energy saver</li> </ul>	 <ul style="list-style-type: none"> <li>• Tiny vibrations when it stops</li> <li>• Cost is high</li> </ul>
 <p>Combines the best features of both types!</p>		
<b>TRANSERVO</b>		

**Point 2**

**Environmentally rugged resolver provides closed loop control**



The resolver used for detecting the motor position is the same reliable resolver as used in our high-level robots. Resolver offer stable position detection even in harsh environments containing dust or oil, etc. Additionally the resolution of the resolver is 20480 pulses per revolution.



The resolver is a magnetic position detector. Its structure is simple with no electronic component and no optical elements. One great feature compared to ordinary optical encoders is that there are very few points where a failure might occur. Vast quantities of resolvers are used in fields like aviation and the automobile industry where reliability is essential and also because they are **highly tough in harsh environments with a low failure rate.**

**Slider type (SS type)**

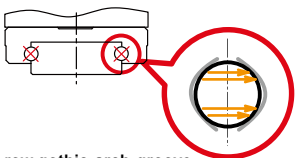
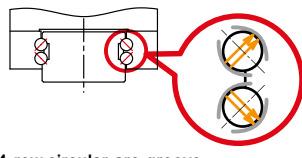
**Point**

**Ideal 4-row circular-groove 2-point contact guide gives longen service life**



A newly developed module guide is employed with a 4-row circular-groove 2-point contact guide built into a very compact actuator.

The guide maintains a satisfactory rolling movement with minimal ball differential slip, even if a large momentum load is applied or the installation surface accuracy (flatness) is bad. Rugged design ensures that breakdowns from problems like abnormal wear will seldom occur.

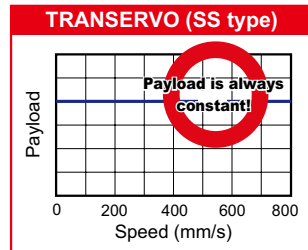
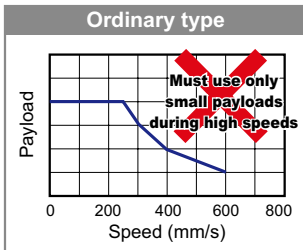
<p style="text-align: center;"><b>Ordinary model</b></p>  <p><b>2-row gothic-arch-groove 4-point contact guide</b></p> <p>Large differential slip tends to occur when a large momentum load is applied or installation surface accuracy is poor.</p>	<p style="text-align: center;"><b>TRANSERVO (SS type)</b></p>  <p><b>4-row circular-arc-groove 2-point contact guide</b></p> <p>Utilizes a circular-arc-groove 2-point contact guide. Ball differential slip (spin) is minimal.</p>
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## Point

### High-speed operation slashes production time!

Making maximum use of advantages offered by the vector control method, the TRANSERVO maintains a constant payload even in the high-speed range. This helps to drastically cut down on the tact time. By combining this feature with high-lead ball screws, the TRANSERVO has achieved a maximum speed of 1 meter per second\* which is faster than any single-axis servo motor.

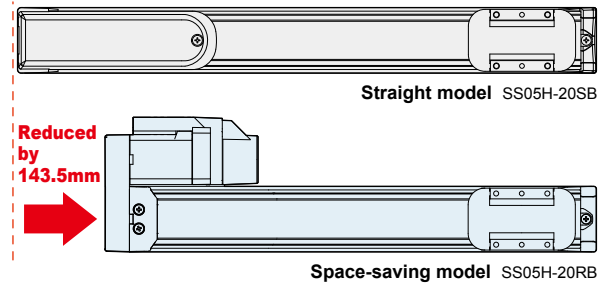
\* SS05/SS05H/SSC05/SSC05H (Lead20mm)



## Point

### Space-saving models newly added to lineup

Space-saving models allow a more efficient layout. Compared to a straight model, the overall length is reduced by up to 143.5mm. This space saving is achieved by folding the motor and makes it possible to design a more efficient layout.



## Rod type (SR type)

## Point

### Long-term maintenance free

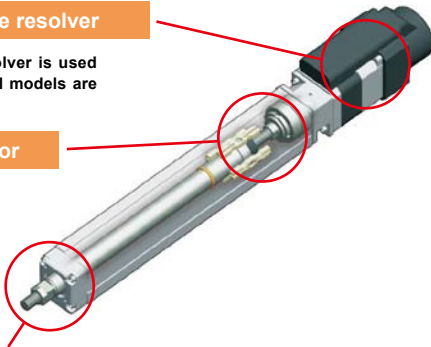
A lubricator used in the ball screw and a contact scraper provides long-life and maintenance-free operation.

#### Uses highly reliable resolver

A rugged and sturdy resolver is used as the position sensor. All models are selectable with a brake.

#### Ball screw lubricator

The lubricator contains grease in a high-density fiber net so that it supplies just the right amount of grease where needed with no waste.



#### Layered contact scraper

The dual-layer scraper prevents micro-contaminants adhering to the rod from penetrating to the inside. This is also effective in suppressing looseness or vibration in the rod.

### ● Needs no maintenance for long periods

Grease lubrication on the ball screw is usually lost a little bit at a time with ball screw movement.

The SR type has a lubricator that supplies grease lost over long periods to ensure near maintenance-free operation <sup>Note</sup>.

Note. The maintenance-free period is within the running life of the robot.

### ● Grease-saving lubrication system

The lubricator uses a high-density fiber net that supplies just the right amount of grease in an eco-friendly lubrication system that wastes no grease.

### ● Prevents contaminant particles

The dual-layer scraper in contact with the rod removes micro contaminant particles with near-perfect performance. It scrapes away tiny particles adhering to the rod in a multi-step operation that prevent trouble from contaminants that might otherwise penetrate to internal parts. Synthetic foam rubber with a self-lubricating function ensures low-friction resistance.

## Robot Positioner

TS-S is a positioner type controller that only performs point trace. No program is needed. Operation is simple. After setting point data, specify the point number and enter a START signal from host controller. Positioning or pushing operation then begins.

**P.396**



## Robot driver

TS-SD is dedicated pulse train control allows eliminating operation via robot language.

Supports open collector and line driver methods selectable by parameter setting and signal wiring connection and easily matches specs of the host device you want to use.

**P.406**

